

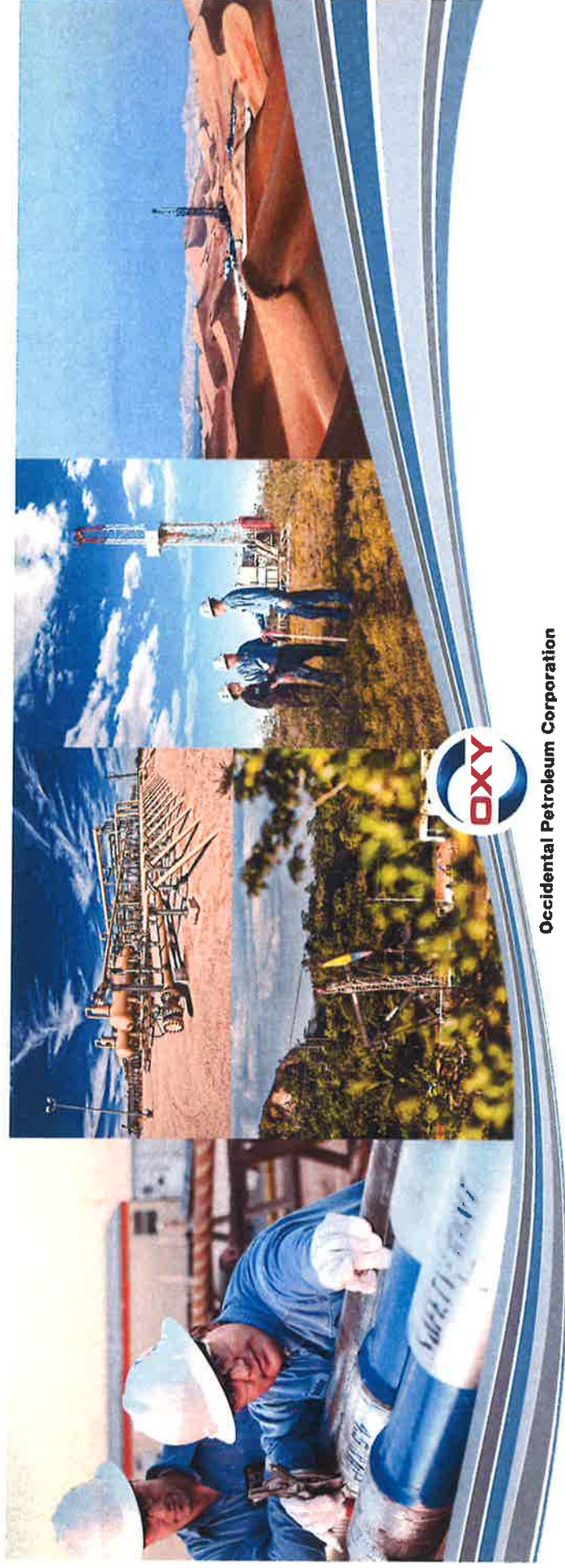
CEDAR CANYON 15 3H GAS INJECTION



Occidental Petroleum

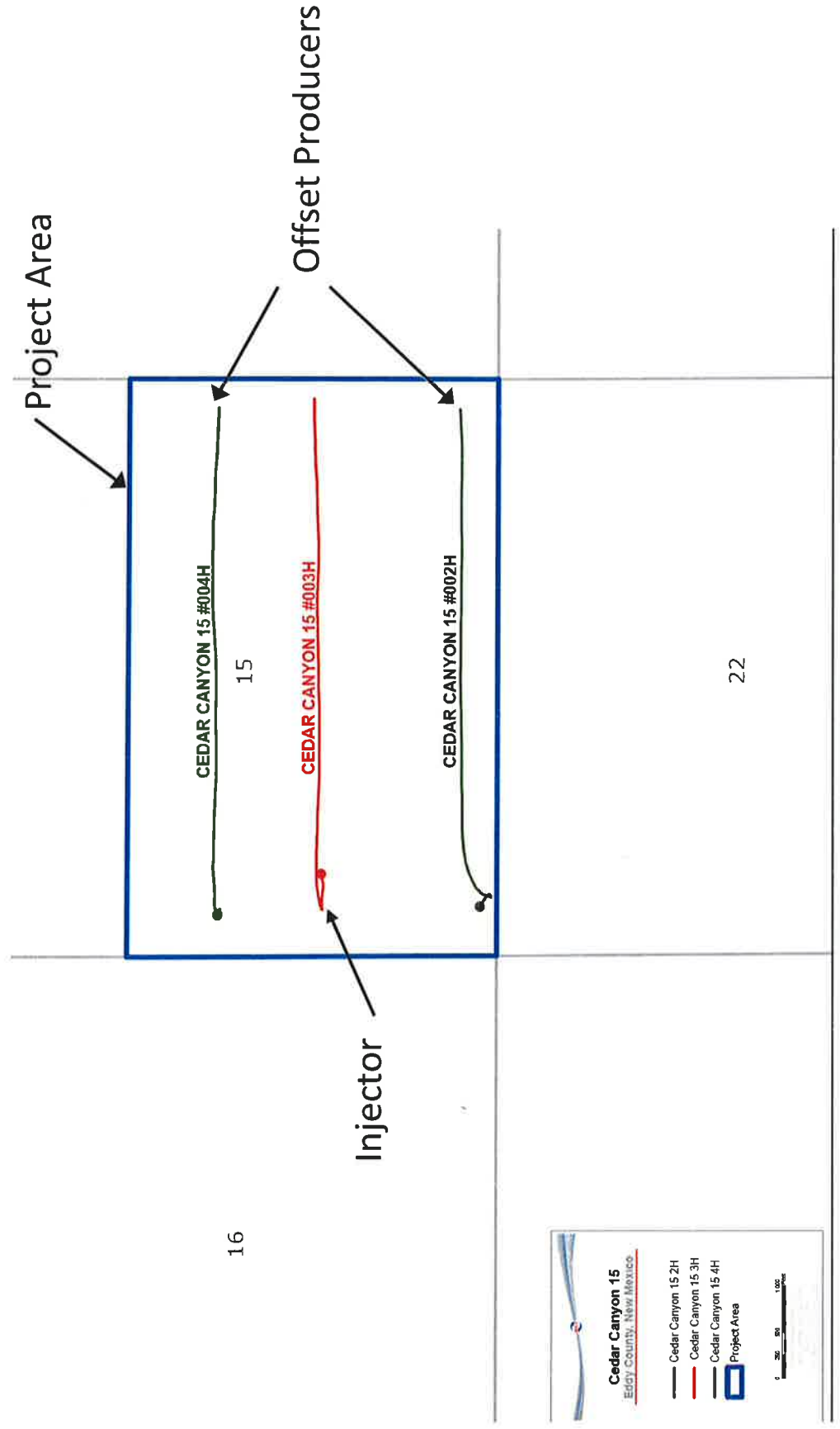
BEFORE THE OIL CONSERVATION DIVISION
EXAMINER HEARING MAY 2, 2019

CASE NO. 20449



Occidental Petroleum Corporation

Project Map



BEFORE THE OIL CONSERVATION DIVISION

Santa Fe, New Mexico

Exhibit No. 1

Case No. 20449

Submitted by: OXY USA, Inc.

Hearing Date: May 2, 2019

GEODETIC COORDINATES
NAD 27 NME

SURFACE LOCATION
Y=440526.1 N
X=609522.8 E

LAT.=32.210627° N
LONG.=103.979217° W

BOTTOM HOLE LOCATION
Y=440684.0 N
X=614107.3 E

LAT.=32.211019° N
LONG.=103.964393° W

PENETRATION POINT
Y=440686.1 N
X=609521.7 E

LAT.=32.211067° N
LONG.=103.979219° W

CORNER COORDINATES TABLE

A - Y=441684.7 N, X=609155.0 E
B - Y=441680.9 N, X=614453.4 E
C - Y=440356.3 N, X=609164.0 E
D - Y=440353.9 N, X=614458.5 E

OPERATOR CERTIFICATION

I hereby certify that the information 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 mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

David Stewart 11/31/13
Signature Date
David Stewart Reg. Abo.
Printed Name
david_stewart@oxy.com
E-mail Address

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.

JANUARY 17, 2013

Date of Survey
Signature & Seal of Professional Surveyor:

Certificate Number 12641
Surveyor's Name Gary C. Eidson

DSS

JWSC W.O.: 13.11.0085

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos 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

NM OIL CONSERVATION

State of New Mexico

ARTESIA DISTRICT

Energy, Minerals & Natural Resources Department

SEP 26 2014

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.

Santa Fe, NM 87505

RECEIVED

Form C-102

Revised August 1, 2011

Submit one copy to appropriate

District Office

☒ AMENDED REPORT

As Directed

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-41594	Pool Code 96473	Pool Name Pierce Crossing Bone Spring, E.
Property Code 39046	Property Name CEDAR CANYON "15"	Well Number 3H
OGRID No. 116696	Operator Name OXY USA INC.	Elevation 2925.8'

Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	15	24 SOUTH	29 EAST, N.M.P.M.		1888'	SOUTH	700'	WEST	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
I	15	24 SOUTH	29 EAST, N.M.P.M.		1888' 2007'	SOUTH	350' 230'	EAST	EDDY
Dedicated Acres 160	Joint or Infill N	Consolidation Code	Order No. TOP Perf - 1942 FSL 1034 FWL (L) Bottom Perf - 2006 FSL 335 FEL (I)						

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.

SURFACE LOCATION NEW MEXICO EAST NAD 1927 Y=442244.0 X=609851.2 LAT.: N 32.2153468 LONG.: W 103.9781369 BOTTOM HOLE LOCATION NEW MEXICO EAST NAD 1927 Y=442234.1 X=611410.7 LAT.: N 32.2155551 LONG.: W 103.9843953 PROJECT AREA PRODUCING AREA GRID AZ = 88°47'09" DISTANCES: 700', 1888', 1942', 330', 4250.54', 1034', 835', 230', 1002', 1906'	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. Signature: <u>David Stewart</u> Date: <u>9/23/14</u> Printed Name: <u>David Stewart Sr. Reg. Adv.</u> E-mail Address: <u>david_stewart@oxy.com</u> 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: <u>MAY 21, 2013</u> Signature and Seal of Professional Surveyor: <u>Jerry J. Asch</u> Certificate Number: <u>15079</u> WO# 130521WL-b (KA)
---	---

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

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

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-41291	Pool Code 96473	Pool Name Pierce Crossing Bone Springs, East
Property Code 39046	Property Name CEDAR CANYON 15	Well Number 4H
GRID No. 16696	Operator Name OXY U.S.A. INC.	Elevation 2926'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	15	24-S	29-E		2310	NORTH	330	WEST	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
H	15	24-S	29-E		2310 2292	NORTH	330 307	EAST	EDDY
Dedicated Acres 160	Joint or Infill W	Consolidation Code	Order No. PB- 2287 FNL 494 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

RECEIVED SEP 03 2013 NMOCD ARTESIA		OPERATOR CERTIFICATION I hereby certify that the information 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 mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>David Stewart</i> 4/22/13 Signature Date David Stewart Sr. Pres. Ado. Printed Name david.stewart@oxy.com E-mail Address	
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. MARCH 29, 2013 Date of Survey Signature & Seal of Professional Surveyor: GARY G. EIDSON 12641 Certificate Number Gary G. Eidson 12641 R. G. Eidson 3239 BKL. PROFESSIONAL SURVEYOR W.O. 13.11.0332		GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION & PENETRATION POINT Y=443357.5 N X=609473.7 E LAT.=32.218411' N LONG.=103.979346' W BOTTOM HOLE LOCATION Y=443352.2 N X=614117.0 E LAT.=32.218354' N LONG.=103.964332' W	
CORNER COORDINATES TABLE A - Y=444340.2 N, X=609137.2 E B - Y=444334.6 N, X=614443.0 E C - Y=443007.9 N, X=614448.3 E D - Y=443013.2 N, X=609146.1 E		PROJECT AREA 33317 PRODUCING AREA GRID AZ = 90°03'54" HORIZ. DIST. = 4644.3	

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: 713-366-5716
- 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: 2/22/19
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 Office

C-108 Application
OXY USA Inc.
Cedar Canyon 15 3H
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 308,883 gal of slick water, 34,444 gal of 15% HCL and 2,425,247 gal of 15# BXL with 3,578,420# of sand.
- X. Logs were filed for the existing well at the time of drilling.

Well Name	Date Submitted
Cedar Canyon 15 3H	09/23/2014
- 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.

1888' FSL 700' FWL
FOOTAGE LOCATION

UNIT LETTER L

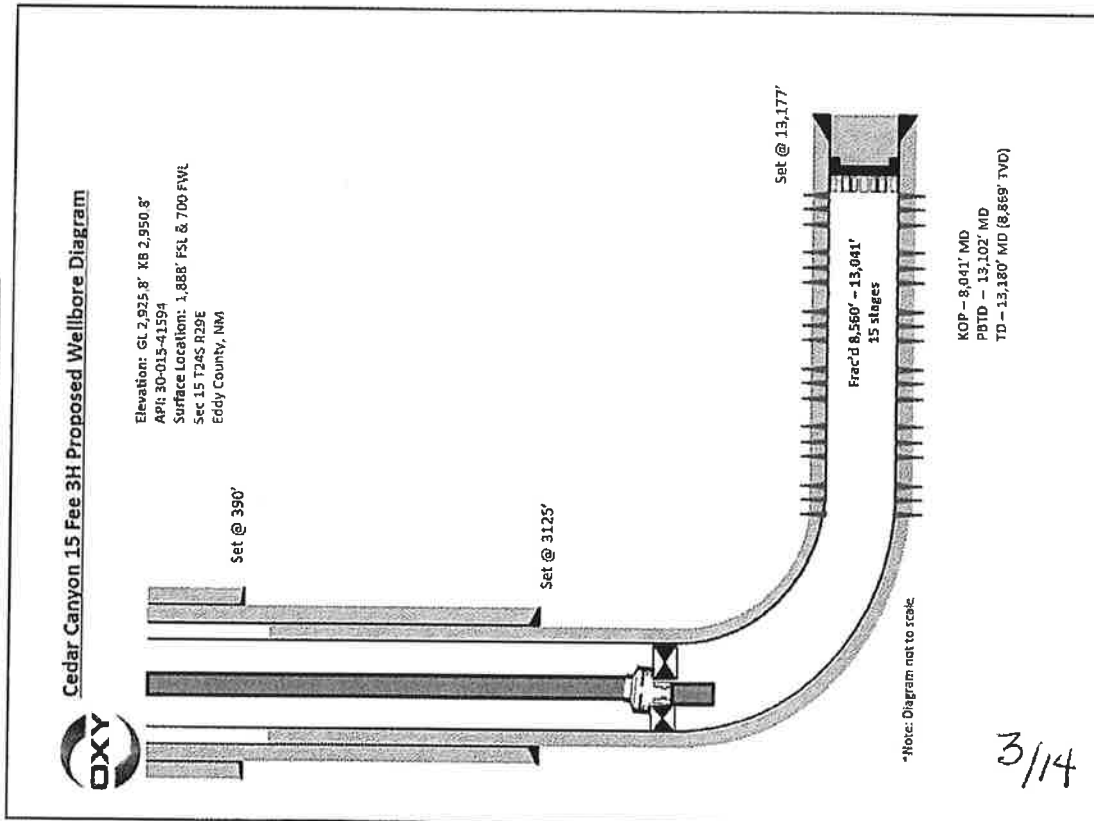
15

245

24S
TOWNSHIP

29E

WELLBORE SCHEMATIC



3/14

KOP - 8,041' MD
P8TD - 13,102' MD
TD - 13,180' MD (8,869' TVD)

9,152'MD/8736' TVD___feet To 13,041'MD/8810' TVD_

(Perforated)

WELL CONSTRUCTION DATA

Surface Casing

Cedar Canyon 15 Fee 3H Proposed Wellbore Diagram

Elevation: GL 2,925.8' KB 2,950.8'
API: 30-015-41594
Surface Location: 1,888' FSL & 700 FWE
Sec 15 T24S R29E
Eddy County, NM

Hole Size: 14 3/4" Casing Size: 11 3/4"

Cemented with: 550 sx. or ft³

Top of Cement: __ Surface __ Method Determined: __ Circulated __

Intermediate Casing

Hole Size: 10 5/8" Casing Size: 8 5/8"

Cemented with: 890 SX, or ft³

Top of Cement: Surface _____ Method Determined: Circulated

Production Casing

Hole Size: 7 7/8" Casing Size: 5 1/2"

Cemented with: 1300 SX. or ff³

Top of Cement: 478' Method Determined: CBL

Total Depth: 13,180' MD 8810' TVD

Injection Interval

Note: Diagram not to scale

INJECTION WELL DATA SHEET

Tubing Size: 2 7/8" PH6 7.90# L-80 tubing Lining Material: None (Will use lined tubing on water injection)

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

Packer Setting Depth: 100' below top of barrier at approximately 7900'

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) (5078')

Wolfcamp Formation (underlying) (10,098')

Item VII
Proposed Operations

Gas Injection

1.

Well Name	Average Daily Rate of Gas to be Injected	Maximum Daily Rate of Gas to be Injected
Cedar Canyon 15 3H	9,000 MCFD	20,000 MCFD

2. This will be a closed system.

3.

Well Name	Average Injection Pressure	Maximum Injection Pressure
Cedar Canyon 15 3H	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 15 3H	5,000 BWIPD	10,000 BWIPD

2. This will be a closed system.

3.

Well Name	Average Injection Pressure	Maximum Injection Pressure
Cedar Canyon 15 3H	1450 psi	1745 psi

4. Water used for injection will be treated produced water from wells drilled in the Bone Springs and Delaware Formations. Water is treated chemically to reduce scale. 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 15 3H	9,000 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 15 3H	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:

- $0.2 \text{ psi/ft} * 8736 \text{ ft (TVD of first perf)} = 1745 \text{ psi}$

Produced Gas and CO2 Injection:

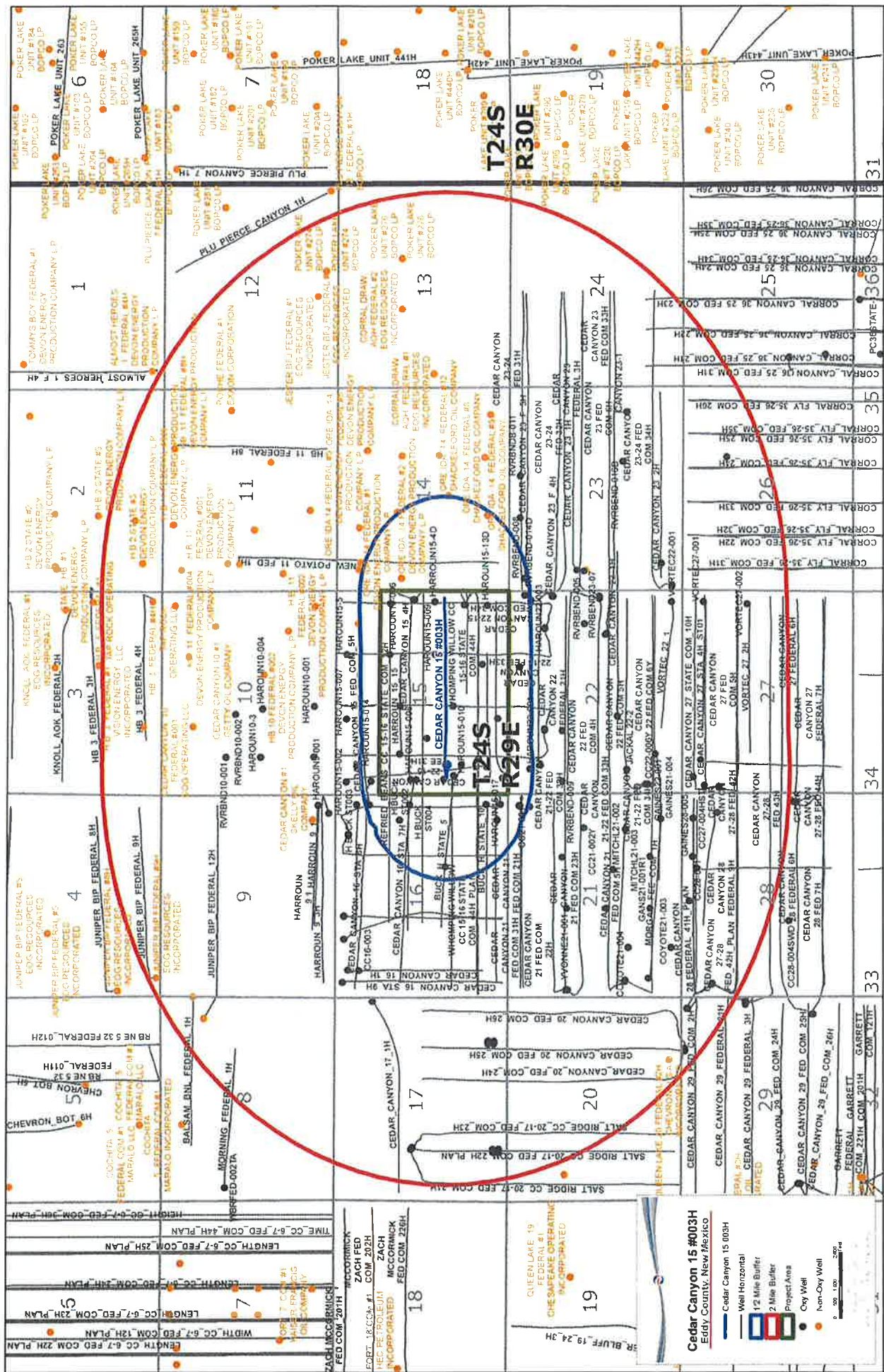
Based on the surface pressure limit for water and assuming a fresh water gradient of 0.433 psi/ft. The bottom hole pressure (BHP) limit is:

- $1745 + 0.433 * 8736 = 5527 \text{ psi (or } 0.633 \text{ psi/ft)}$

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.

6/14



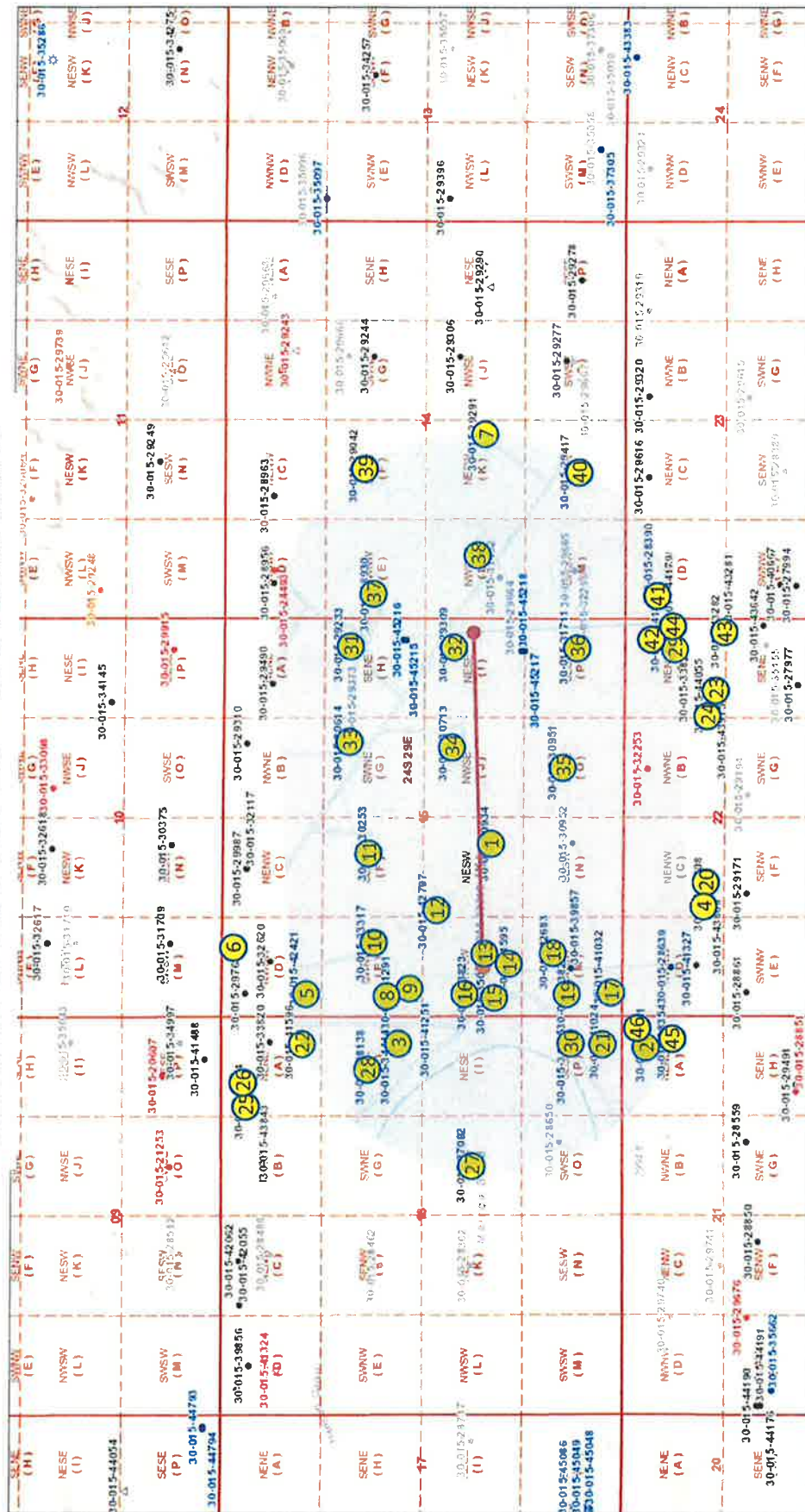
Cedar Canyon 15 #003H
Eddy County, New Mexico

- Well Horizontal
- 12 Mile Buffer
- 2 Mile Buffer
- Project Area
- Dry Well
- Non-Oil Well



7/14

CEDAR CANYON 15 #3H AOR MAP



11/6/2015 5:30:41 PM

1/2 Mile Area of Review

13

Well ID on AOR Table

Cedar Canyon 15 #3H

11/6/2015 5:30:41 PM

8/14

9/14

Part VIII- Geologic Information for Cedar Canyon 15 3H

The Cedar Canyon 15 3H will be injecting into the 2nd Bone Spring Sandstone of the Bone Spring Formation. The well has a TVD of 8,810 ft. with a lateral length of approximately 4,370 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.

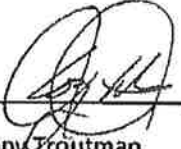
The injection area for this well is bounded by two producing wells in the same reservoir interval that is 300 ft. thick. Low-permeability barriers act as seals above and below the reservoir. These barriers consist of carbonate mudstone and dolomudstone that are 565 ft. thick above and 800 ft. thick below. 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 6,639 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 552 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 approximately 370 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 one mile:

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

2/28/2019
Date

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	Calcite		Barite		Celestite	
	% 1 st BS	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

12/14

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

**C-108 Injection Application
Item XIII - Proof of Notice
OXY USA Inc.
Cedar Canyon 15 Federal 3H**

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

State of New Mexico
P.O. Box 1148
Santa Fe, NM 87504

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
301 Sir Barton Parkway
Midland, TX 79705

Devon Energy Production Co LP
6100 N Western
Oklahoma City, Oklahoma 73118

Rutter and Wilbanks Corporation
P.O. Box 3186
Midland, TX 79701

Shackelford Oil Company
11417 W Country Road 33
Midland, TX 79707

Mobil Producing Texas and New Mexico Inc.
22777 Springwoods Village Pkwy
Spring, TX 77389-1425

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

Oxy USA WTP LP
5 Greenway Plaza Ste 110
Houston, TX 77046

Oxy USA Inc
5 Greenway Plaza Ste 110
Houston, TX 77046

14/14

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

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

CASE NO. 20449

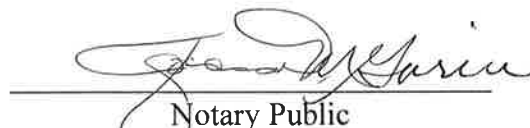
AFFIDAVIT

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

Michael H. Feldewert, attorney in fact and authorized representative of Oxy U.S.A., 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 1st day of May, 2019 by Michael H.
Feldewert.


Notary Public

My Commission Expires:


August 26, 2021
12437632-1

BEFORE THE OIL CONSERVATION DIVISION
Santa Fe, New Mexico
Exhibit No. 4
Case No. 20449
Submitted by: OXY USA, INC.
Hearing Date: May 2, 2019

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

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

CASE NO. 20449

APPLICATION

OXY USA Inc. ("OXY"), through its undersigned attorneys, hereby files this application with the Oil Conservation Division for an order approving a pressure maintenance project in the Bone Spring formation underlying a project area comprised of the S/2 N/2 and the S/2 of Section 15, Township 24 South, Range 29 East, NMPM, Eddy County, New Mexico. In support of its application, OXY states:

1. OXY USA Inc., (OGRID No. 16696) is the operator of the following horizontal wells drilled and completed in the Pierce Crossing Bone Spring, East Pool (Pool Code 96473) underlying Section 15, Township 24 South, Range 29 East, NMPM, Eddy County, New Mexico:

- The Cedar Canyon 15 2H well (30-015-41032) dedicated to the S/2 S/2 of Section 15;
- The Cedar Canyon 15 3H well (30-015-41594) dedicated to the N/2 S/2 of Section 15; and
- The Cedar Canyon 15 4H well (30-015-41291) dedicated to the S/2 N/2 of Section 15.

2. OXY seeks approval to inject produced gas, produced water and carbon dioxide into the Bone Spring formation through the **Cedar Canyon 15 3H well** at total vertical depth of approximately 8736 feet to approximately 8810 feet along the horizontal portion of the wellbore. Oxy anticipates injection into this well will provide pressure maintenance support for the offsetting Cedar Canyon 15 2H and Cedar Canyon 15 4H wells.



April 12, 2019

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 15 3H injection well**

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 May 2, 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



\$5.90

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 20449

CM# 44506.0005

*add pager
1804
postage*

Shipment Date: 04/12/2019

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	14
Total	14 ✓

*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 0013 8424 36





Firm Mailing Book For Accountable Mail

Name and Address of Sender Holland & Hart LLP 110 N Guadalupe St # 1 Santa Fe NM 87501		Check type of mail or service ☐ Adult Signature Required ☐ Adult Signature Restricted Delivery ☒ Certified Mail ☐ Certified Mail Restricted Delivery ☐ Collect on Delivery (COD) ☐ Insured Mail ☐ Priority Mail		Priority Mail Express ☐ Registered Mail ☐ Return Receipt for Merchandise ☐ Signature Confirmation ☐ Signature Confirmation Restricted Delivery												
USPS Tracking/Article Number		Addressee (Name, Street, City, State, & ZIP Code™)		Affix Stamp Here (if issued as an international certificate of mailing or for additional copies of this receipt). Postmark with Date of Receipt.												
1. 9214 8901 9403 8381 3888 74		New Mexico Oil Conservation Division 811 S First St. Artesia NM 88210		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
				0.49	3.50								1.60			
2. 9214 8901 9403 8381 3888 81		New Mexico Oil Conservation Division 1220 South St Francis Dr Santa Fe NM 87505		0.49	3.50								1.60			
3. 9214 8901 9403 8381 3888 98		United States Dept of Interior - Bureau of Land Management 620 E Greene Street Carlsbad NM 88220		0.49	3.50								1.60			
4. 9214 8901 9403 8381 3889 04		State of New Mexico PO BOX 1148 Santa Fe NM 87504		0.49	3.50								1.60			
5. 9214 8901 9403 8381 3889 11		Leopard Petroleum LP PO BOX 51440 Midland TX 79710		0.49	3.50								1.60			
6. 9214 8901 9403 8381 3889 28		Beryl Oil and Gas LP PO BOX 51440 Midland TX 79710		0.49	3.50								1.60			
7. 9214 8901 9403 8381 3889 35		B Jack Reed 506 Charismatic Midland TX 79705		0.49	3.50								1.60			
8. 9214 8901 9403 8381 3889 42		DRW Energy KKC 400 W Illinois Ste 970 Midland TX 79701		0.49	3.50								1.60			
Total Number of Pieces Listed by Sender 14		Total Number of Pieces Received at Post Office														
Postmaster, Per (Name of receiving employee)																



Firm Mailing Book For Accountable Mail

Name and Address of Sender Holland & Hart LLP 110 N Guadalupe St # 1 Santa Fe NM 87501		Check type of mail or service ☐ Adult Signature Required ☐ Adult Signature Restricted Delivery ☒ Certified Mail ☐ Certified Mail Restricted Delivery ☐ Collect on Delivery (COD) ☐ Insured Mail ☐ Priority Mail		Affix Stamp Here (if issued as an international certificate of mailing or for additional copies of this receipt) Postmark with Date of Receipt.													
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 8381 3889 59		Devon Energy Production Co LP 8100 N Western Oklahoma City OK 73118		0.49		3.50								1.60			
10. 9214 8901 9403 8381 3889 66		MLissa M Schoening 301 St Barton Parkway Midland TX 79705		0.49		3.50								1.60			
11. 9214 8901 9403 8381 3889 73		Ruter and Wilbanks Corporation PO BOX 3186 Midland TX 79701		0.49		3.50								1.60			
12. 9214 8901 9403 8381 3889 80		Shackelford Oil Company 11417 W Country Road 33 Midland TX 79707		0.49		3.50								1.60			
13. 9214 8901 9403 8381 3889 97		Mobil Producing Texas and New Mexico Inc 22777 Springwoods Village Pkwy Spring TX 77389-1425		0.49		3.50								1.60			
14. 9214 8901 9403 8381 3890 00		GD McKinney Investments LP 30 N Warrenfield Ste 1100 Midland TX 79701		0.49		3.50								1.60			
Total Number of Pieces Listed by Sender 14		Total Number of Pieces Received at Post Office		Postmaster, Per (Name of receiving employee)													

OXY / Cedar Canyon
15 3H Well

Barcode	Recipient	Status
9.21489E+21	New Mexico Oil Conservation Division 811 S First St Artesia NM 88210	Delivered Signature Received
9.21489E+21	New Mexico Oil Conservation Division 1220 South St Francis Dr Santa Fe NM 87505	Delivered Signature Received
9.21489E+21	United States Dept of Interior - Bureau of Land Management 620 E Greene Street Carlsbad NM 88220	Delivered Signature Received
9.21489E+21	State of New Mexico PO BOX 1148 Santa Fe NM 87504	Delivered Signature Received
9.21489E+21	Leopard Petroleum LP PO BOX 51440 Midland TX 79710	Delivered Signature Received
9.21489E+21	Beryl Oil and Gas LP PO BOX 51440 Midland TX 79710	Delivered Signature Received
9.21489E+21	B Jack Reed 506 Charismatic Midland TX 79705	Delivered Signature Received
9.21489E+21	DRW Energy KKC 400 W Illinois Ste 970 Midland TX 79701	Delivered Signature Received
9.21489E+21	Devon Energy Production Co LP 6100 N Western Oklahoma City OK 73118	Return To Sender
9.21489E+21	M'Lissa M Schoening 301 Sir Barton Parkway Midland TX 79705	In-Transit
9.21489E+21	Rutter and Wilbanks Corporation PO BOX 3186 Midland TX 79701	In-Transit
9.21489E+21	Shackelford Oil Company 11417 W Country Road 33 Midland TX 79707	Delivered Signature Received
9.21489E+21	Mobil Producing Texas and New Mexico Inc 22777 Springwoods Village Pkwy Spring TX 77389-1425	Delivered Signature Received
9.21489E+21	GD McKinney Investments LP 30 N Marienfield Ste 1100 Midland TX 79701	In-Transit

CARLSBAD CURRENT-ARGUS

AFFIDAVIT OF PUBLICATION

Ad No.
0001283287

HOLLAND & HART
PO BOX 2208

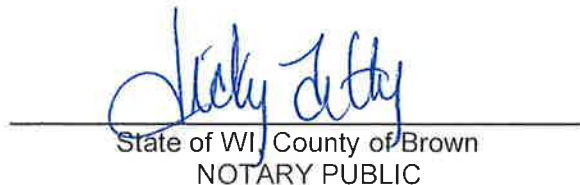
SANTA FE NM 87504

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:

04/16/19


Legal Clerk

Subscribed and sworn before me this
16th of April 2019.


State of WI, County of Brown
NOTARY PUBLIC


My Commission Expires

Ad#:0001283287
P O : Cedar Canyon
of Affidavits :0.00



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 **May 2, 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 **April 22, 2019**. 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 State Dept. of Interior, Bureau of Land Management; State of New Mexico; 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; Devon Energy Production Co LP; Rutter and Wilbanks Corporation; Shackelford Oil Company; Mobil Producing Texas and New Mexico Inc.; GD McKinney Investments LP.

CASE 20449: 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 of the S/2 N/2 and the S/2 of Section 15, Township 24 South, Range 29 East, NMPM, Eddy County, New Mexico. Produced gas, produced water and carbon dioxide may be injected into the Bone Spring formation through the **Cedar Canyon 15 3H well** (API No. 30-015-41594) at total vertical depth of approximately 8736 feet to approximately 8810

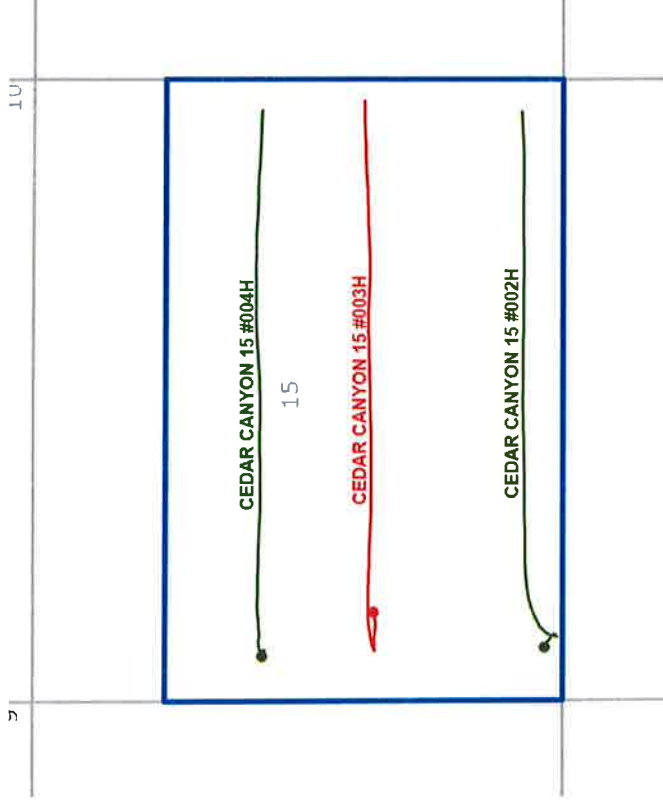
feet along the horizontal portion of the wellbore. Oxy seeks approval to inject at the following surface injection pressures:

Produced gas: 4,350 psi
Produced water: 1,745 psi
Carbon dioxide: 2300 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 these injection wells and for allowance to use unlined tubing. The proposed project is located approximately nine miles southeast of Loving, New Mexico.

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 Canyon 15 Fed 3H
- 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 15 Fed 3H. 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: 1745 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 15 Federal 3H	8736	1745

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.

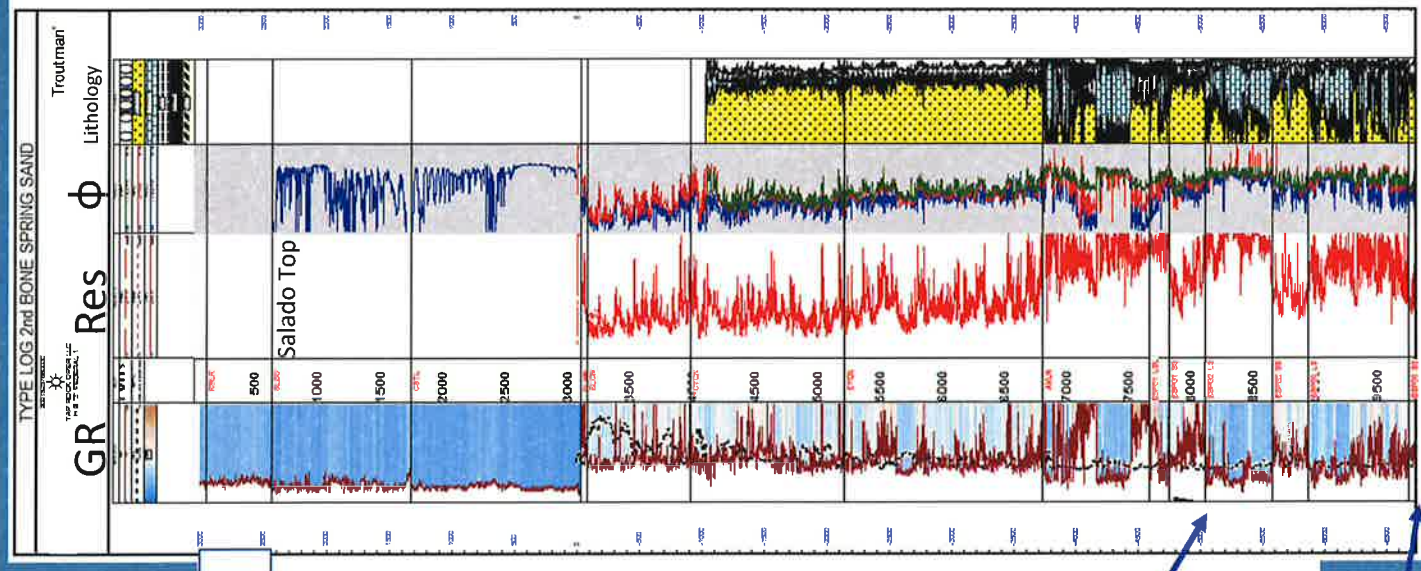
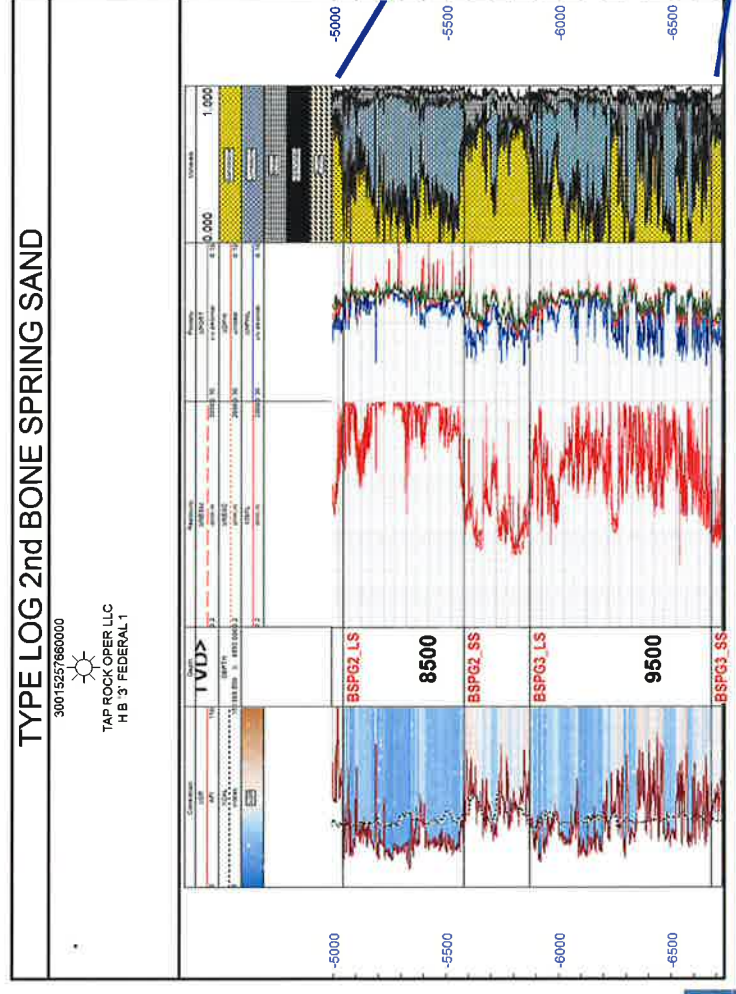
Well	TVD (ft)	Max Inj BHP	Max Gas Inj THP, psi	Max CO2 Inj THP, psi
Cedar Canyon 15 Federal 3H	8736	5527	4350	2300



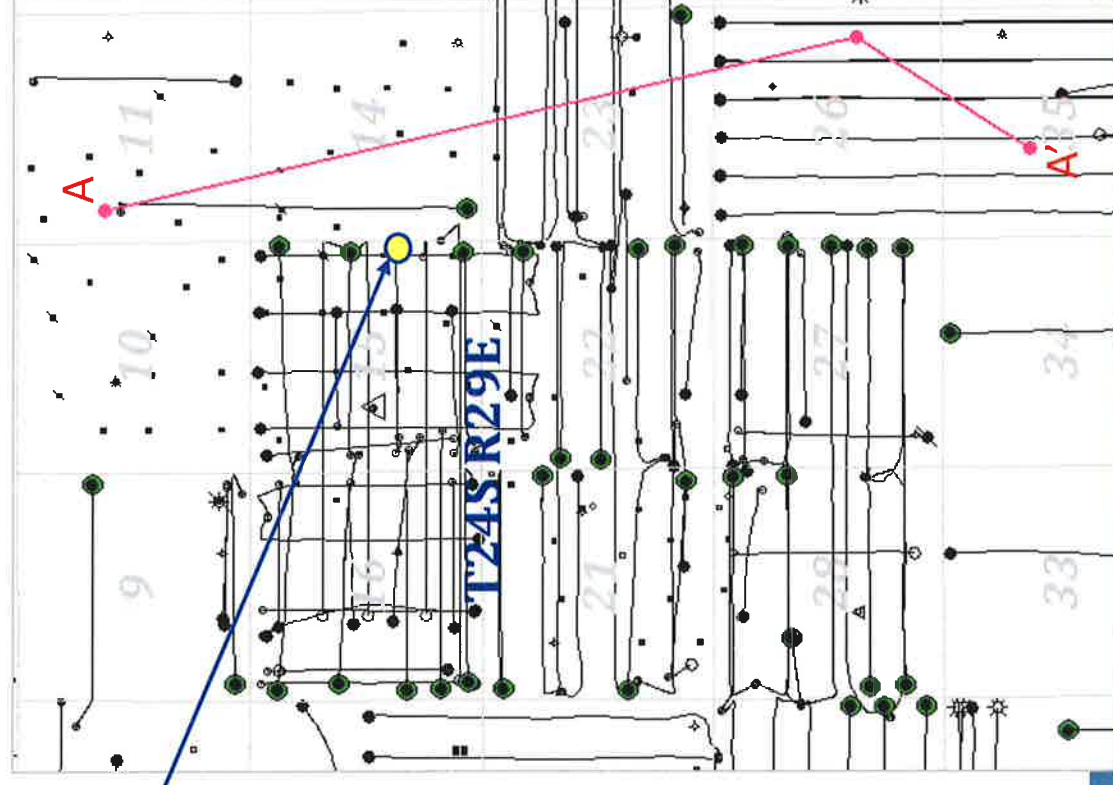
Cedar Canyon 15 3H 2nd Bone Spring Type Log

- 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



Cedar Canyon 15 3H Cross-section location



Cedar Canyon 15-3H

Green highlights
are 2nd Bone Spring
wells

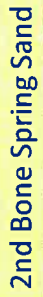
Cross section location
is representative of the
geology seen in the
horizontal wells in Sec. 15
2nd BS wells in Sec 15 have
only MWD GR logs

1 mile

BEFORE THE OIL CONSERVATION DIVISION
Santa Fe, New Mexico
Exhibit No. 9
Case No. 20449
Submitted by: OXY USA, INC.
Hearing Date: May 2, 2019

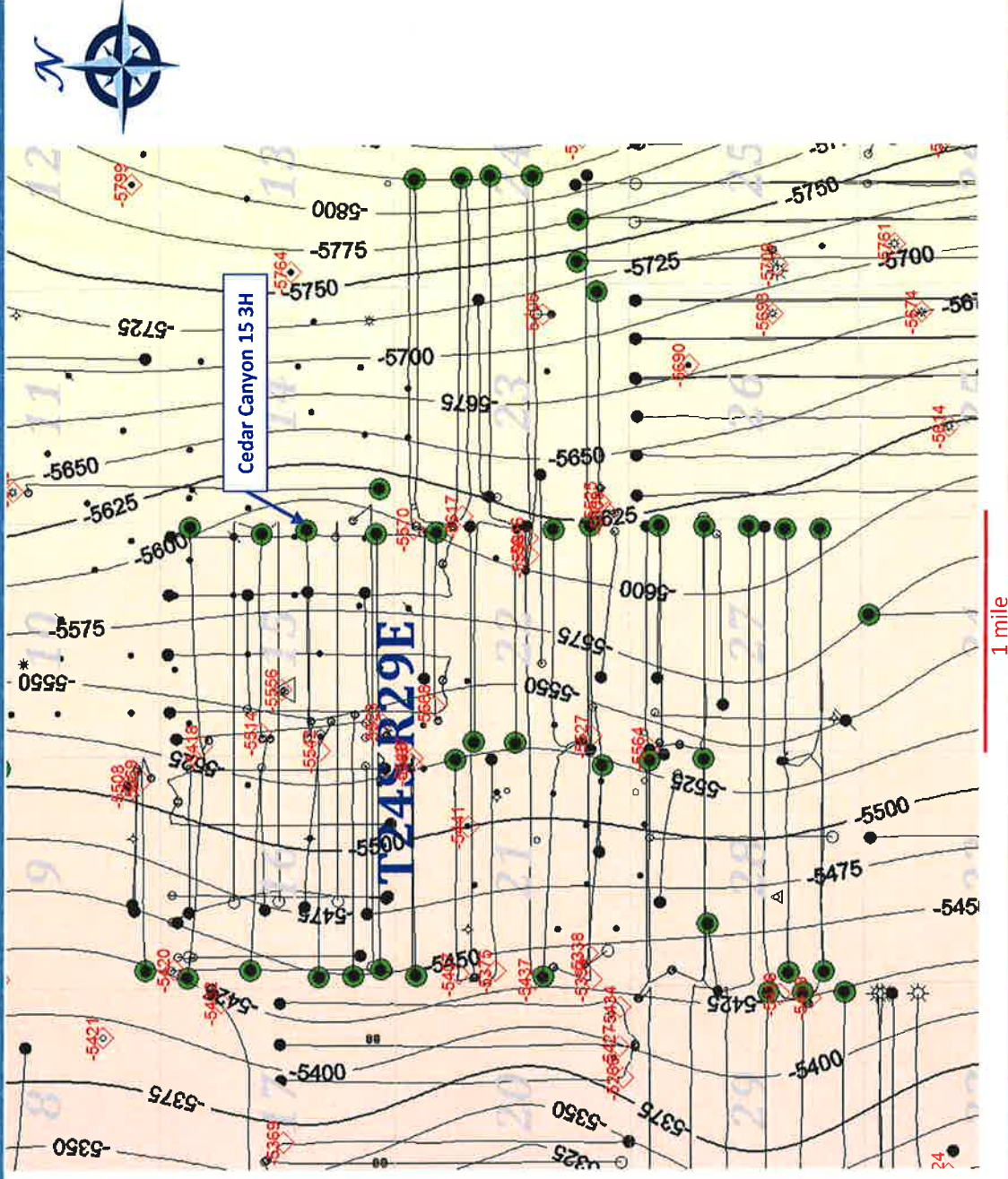


Author: Tony Troutman, Geological Advisor, Oxy USA



Cedar Canyon 15 3H 2nd Bone Spring Sand Top Structure

- Posted depths show well control
- Depths are TVD subsea, contour interval 25 ft
- 2nd Bone Spring wells marked by green highlights
- Sections 8,9,10, 17, 16, 15, 20, 21, 22, 23, 29, 28, 27, 26, 25, 35, 36 are Oxy operated



AOR for Injector: Cedar Canyon 15 #3H (API# 30-015-41594)

WELL ID NUMBER	API NUMBER	OPERATOR	LEASE NAME	WELL L	WELL TYPE	STATUS	Surface Location										DATE DRILLED	TOTAL TVD	TOTAL LMD	HOLE SIZE	CSG SIZE	SET AT	SX CM	CMT TOP	HOW MEASURE	DVT	CURRENT PROD POOL	CURRENT COMPLETION	ADDITIONAL INFORMATION
							FTG N/S	FTG E/W	UNIT	SECT	SHIP. RNG.																		
1	30-015-30934	OXY USA INC.	Harroun 15	10	OIL	ACTIVE	1700' FNL	2310' FWL	K	15	24	S 29 E	2/23/2000	6880'	6880'	14 3/4"	10 3/4"	593'	540'	Surf	Circ		CEDAR CANYON; DELAWARE	5252' - 6477'					
2	30-015-44181	OXY USA INC	CEDAR CANYON 21 FEDERAL COM	21H	Oil	Active	369' FNL	368' FEL	A	21	24	S 29 E	11/3/2017	8550'	13503'	14.75"	10 3/4"	463'	329'	Surf	Circ.	5497'	Cotton Draw BS (2nd BS)	8751' - 13302'					
																9 7/8" 6 3/4"	7 5/8" 4 1/2"	2875' 6880'	900' 1115'	Surf 2300'	Circ Calc.								
3	30-015-34444	OXY USA INC	H BUCK STATE	4H	OIL	ACTIVE	2310' FNL	330' FEL	H	16	24	S 29 E	2/21/2006	7609'	10686'	17 1/2"	13 3/8"	254'	350'	Surf	Circ		PIERCE CROSSING; BONE SPRING, EAST	7879' - 10326'					
4	30-015-43808	OXY USA INC.	CEDAR CANYON 22 15 FEE	32H	OIL	ACTIVE	1108' FNL	1633' FWL	C	22	24	S 29 E	8/29/2016	9926'	16075'	14 3/4"	10 3/4"	442'	470'	Surf	Circ		PIERCE CROSSING; BONE SPRING, EAST	9994' - 15862'	BHL IS IN THE AOR.				
																9 7/8" 6 3/4"	7 5/8" 4 1/2"	7885' 13496'	1951' 700'	Surf 7713'	Circ. Circ.								
5	30-015-42421	OXY USA INC.	CEDAR CANYON 15 FEDERAL COM	5H	OIL	ACTIVE	1095' FNL	290' FWL	D	15	24	S 29 E	12/11/2014	8809'	13508'	12 1/4" 8 1/2" X 7 7/8"	9 5/8" 5 1/2"	2830' 10686'	900' 2050'	Surf 1920'	Circ CBL		PIERCE CROSSING; BONE SPRING, EAST	9563' - 13319'					
																14 3/4" 10 5/8" 7 7/8"	11 3/4" 8 5/8" 5 1/2"	380' 2937' 13508'	796' 930' 570'	Surf Surf Surf	Circ Circ Circ								
6	30-015-43809	OXY USA INC.	CEDAR CANYON 22 15 FEE	31H	OIL	ACTIVE	1108' FNL	1603' FWL	C	22	24	S 29 E	8/29/2016	9906'	16050'	14 3/4"	10 3/4"	443'	470'	Surf	Circ.		PIERCE CROSSING; BONE SPRING, EAST	10004' - 15872'	BHL IS IN THE AOR.				
7	30-015-29291	SHACKELFORD OIL CO	ORE IDA 14 FEDERAL	12	OIL	ACTIVE	1880' FSL	2480' FWL	K	14	24	S 29 E	4/29/1997	8332'	8332'	14 3/4"	10 3/4"	443'	470'	Surf	Circ.		PIERCE CROSSING; BONE SPRING, EAST	7815' - 7899'					
																9 7/8" 6.75"	7 5/8" 5 1/2"	9188' 16031'	1915' 470'	Surf 8690'	Circ. CBL								
8	30-015-41291	OXY USA INC	CEDAR CANYON 15	4H	OIL	ACTIVE	2310' FNL	330' FWL	E	15	24	S 29 E	8/1/2013	8783'	13111'	17 1/2"	13 3/8"	377'	425'	Surf	Circ		PIERCE CROSSING; BONE SPRING, EAST	9000' - 12900'					
																12 1/4" 7 7/8"	8 5/8" 5 1/2"	3075' 8336'	800' 1150'	Surf 3475'	Circ CBL								
9	30-015-41251	OXY USA INC	CEDAR CANYON 16 STATE	7H	INJECTION	ACTIVE	2485' FNL	330' FWL	E	15	24	S 29 E	4/15/2013	8644'	13762'	14 3/4"	11 3/4"	335'	680'	Surf	Circ.		PIERCE CROSSING; BONE SPRING, EAST	9200'-13560'					
																10 5/8" 7 7/8"	8 5/8" 5 1/2"	3095' 13725'	1000' 1570'	Surf Surf	Circ. Circ.								
10	30-015-33317	OXY USA INC	HARROUN 15	15	OIL	ACTIVE	1980' FNL	990' FWL	E	15	24	S 29 E	10/21/2004	7808'	10192'	17 1/2"	13 3/8"	545'	800'	Surf	Circ		PIERCE CROSSING; BONE SPRING, EAST	8249' - 10100'					
11	30-015-30253	OXY USA INC	HARROUN 15	8	OIL	ACTIVE	1980' FNL	2310' FWL	F	15	24	S 29 E	12/7/1998	6885'	6885'	12 1/4" 8 1/2" X 7 7/8"	9 5/8" 5 1/2"	2865' 10192'	800' 890'	Surf 6500'	Circ Calc.		CEDAR CANYON; DELAWARE	4660' - 5078' 6448' - 6456' 6620' - 6688'	Shallower Delaware perms added 3/2001. Middle set of Delaware perms added 1/1999. Deepest Delaware perms were original perms.				
																14 3/4" 10 5/8" 7 7/8"	11 3/4" 8 5/8" 5 1/2"	357' 3091' 13106'	950' 960' 1420'	Surf 240' 2930'	Circ Calc. CBL								
12	30-015-42797	OXY USA INC	CEDAR CANYON 15 SWD	1	SWD	ACTIVE	2500' FSL	1400' FWL	K	15	24	S 29 E	5/5/2015	16014'	16014'	24"	18 5/8"	277'	900'	Surf	Circ		Devonian - Silurian	14842' - 15964' (OH)					
13	30-015-41594	OXY USA INC	CEDAR CANYON 15	3H	OIL	ACTIVE	1888' FSL	700' FWL	L	15	24	S 29 E	8/30/2014	8810'	13180'	17 1/2" 12 1/4" 8 1/2"	13 3/8" 9 5/8" 7"	3107' 10155' 14842'	2720' 3450' 630'	Surf Surf 9755'	Circ Surf & CBL Circ	3177'	PIERCE CROSSING; BONE SPRING, EAST	9152' - 13041'	CBL ran 4/18/2015, verified TOC Top of liner at 9755'				
																14 3/4"	11 3/4"	390'	550'	Surf	Circ								
14	30-015-41595	OXY USA INC	CEDAR CANYON 16 STATE	6H	OIL	ACTIVE	1430' FSL	710' FWL	L	15	24	S 29 E	6/10/2014	8620'	13786'	10 5/8" 7 7/8"	8 5/8" 5 1/2"	3125' 13177'	890' 1300'	Surf 945'	Circ Calc.		PIERCE CROSSING; BONE SPRING, EAST	9115'-13625'					
																14 3/4"	11 3/4"	364'	550'	Surf	Circ.								
15	30-015-35042	OXY USA INC	H BUCK STATE	5	OIL	ACTIVE	1680' FSL	430' FWL	L	15	24	S 29 E	9/30/2006	7630'	10792'	17 1/2"	13 3/8"	522'	450'	Surf	Circ.		PIERCE CROSSING; BONE SPRING, EAST	8244'-10600'					
																10 5/8" 7 7/8"	8 5/8" 5 1/2"	3144' 13786'	890' 1410'	Surf Surf	Circ. Circ.								
16	30-015-33823	OXY USA INC	HARROUN 15	16	OIL	ACTIVE	1980' FSL	330' FWL	L	15	24	S 29 E	5/2/2005	10800'	10800'	12 1/4" 8 1/2" x 7 7/8"	9 5/8" 5 1/2"	2884' 10792'	900' 450'	Surf 2700'	Circ. CBL		PIERCE CROSSING; BONE SPRING, EAST	8053' - 10750'					
																17 1/2"	13 3/8"	514'	900'	Surf	Circ.								
																12 1/4"	9 5/8"	2870'	1100'	Surf	Circ.				BEFORE THE OIL CONSERVATION DIVISION Santa Fe, New Mexico Exhibit No. 12				

WELL ID NUMBER	API NUMBER	OPERATOR	LEASE NAME	WEL L	WELL TYPE	STATUS	FTG N/S	FTG E/W	UNIT	SECT	SHIP. RNG.	DATE DRILLED	TOTAL TVD	TOTA L MD	HOLE SIZE	CSG SIZE	SET AT	SX CM	CMT TOP	HOW MEASURE	DVT	CURRENT PROD POOL	CURRENT COMPLETION	ADDITIONAL INFORMATION
															8 1/2" (to 7890') 7 7/8" (to 10800')	5 1/2"	10800'	2340	1091'	Calc.				After running and cementing 5 1/2", ran CBL, found TOC at 4420', perfed at 4406' and squeezed cement. Est TOC @ 1091'
17	30-015-41032	OXY USA INC	CEDAR CANYON 15	2H	OIL	ACTIVE	170'	FSL	360'	FWL	M 15 24 S 29 E	5/9/2013	8795	12960	14 3/4"	11 3/4"	334'	280	Surf	Circ.		PIERCE CROSSING; BONE SPRING, EAST	8900' - 12800'	BHL IS IN THE AOR.
															10 5/8" 7 7/8"	8 5/8" 5 1/2"	3101' 12960'	840 1450	Surf 5225'	Circ. CBL				
18	30-015-42683	OXY USA INC	CEDAR CANYON 16 STATE	12H	OIL	ACTIVE	900'	FSL	860'	FWL	M 15 24 S 29 E	11/7/2016	8624'	14422'	14 3/4"	11 3/4"	445'	680	Surf	Circ.		PIERCE CROSSING; BONE SPRING, EAST	9704'-14214'	
															10 5/8" 7 7/8"	8 5/8" 5 1/2"	2965' 14417'	850 1570	Surf 600'	Circ. Calc.				
19	30-015-33822	OXY USA INC	HARROUN 15	17	OIL	ACTIVE	660'	FSL	330'	FWL	M 15 24 S 29 E	9/7/2006	10887	10887	17 1/2"	13 3/8"	315'	580	Surf	Circ		PIERCE CROSSING; BONE SPRING, EAST	8405' - 10740'	
															12 1/4" 8 1/2"	9 5/8" 5 1/2"	2880' 10887'	1000 2005	Surf 3940'	Circ CBL	n/a		DV tool ran but no depth provided	
20	30-015-43809	OXY USA INC	CEDAR CANYON 22 15 FEE	31H	OIL	ACTIVE	1108'	FNL	1603'	FWL	C 22 24 S 29 E	8/29/2016	9906'	16050'	14 3/4"	10 3/4"	443'	470	Surf	Circ.		PIERCE CROSSING; BONE SPRING, EAST	10004' - 15872'	
															9 7/8" 6 3/4"	7 5/8" 5 1/2"	9199' 16031'	1915 470	Surf 8690'	Circ. CBL				
21	30-015-41024	OXY USA INC	CEDAR CANYON 16 STATE	2H	OIL	ACTIVE	230'	FSL	330'	FEL	P 16 24 S 29 E	5/8/2013	8626'	13240	16"	13 3/8"	356'	625	Surf	Circ		PIERCE CROSSING; BONE SPRING, EAST	8860' - 13000'	BHL IS IN THE AOR.
															12 1/4" 8 3/4"	9 5/8" 5 1/2"	2977' 13240'	1260 2210	Surf 5030'	Circ CBL				
22	30-015-41596	OXY USA INC	CEDAR CANYON 16 STATE	8H	OIL	ACTIVE	1040'	FNL	330'	FEL	A 16 24 S 29 E	6/29/2014	8618'	13560'	14 3/4"	11 3/4"	364'	599	Surf	Circ		PIERCE CROSSING; BONE SPRING, EAST	9017'-13407'	
															10 5/8" 7 7/8"	8 5/8" 5 1/2"	3118' 13544'	890 1350	Surf Surf	Circ Circ				
23	30-015-44055	OXY USA INC	Cedar Canyon 22 15 FEDERAL COM	34H	OIL	ACTIVE	1107'	FNL	1022'	FEL	A 22 24 S 29 E	5/24/2017	9970'	16100'	14 3/4"	10 3/4"	441'	625	Surf	Circ.		PIERCE CROSSING BONE SPRING EAST	9980' - 15931'	Lateral goes through the AOR.
															9 7/8" 6 3/4"	7 5/8" 4 1/2"	9481' 16091'	1350 660	Surf 9355'	Circ. Circ			Top of liner at 9355'	
24	30-015-43915	OXY USA INC	Cedar Canyon 22 15 FEE	33H	GAS	ACTIVE	1107'	FNL	1052'	FEL	A 22 24 S 29 E	5/24/2017	10090'	16336'	14 3/4"	10 3/4"	438'	665	Surf	Circ		PURPLE SAGE WOLFCAMP GAS	10252' - 16170'	Lateral goes through the AOR.
															9 7/8" 6 3/4"	7 5/8" 4 1/2" 5 1/2"	9516' 16326' 9383'	2540 670	10' 9383'	TS Circ	3051'		Top of liner at 9383' 5 1/2" tie back string run after liner was set and cemented	
25	30-015-43844	OXY USA INC	CEDAR CANYON 16 STATE	33H	GAS	ACTIVE	402'	FNL	###	FEL	A 16 24 S 29 E	12/4/2016	10034'	14695'	14 3/4"	10 3/4"	447'	252	Surf	Circ.		PURPLE SAGE WOLFCAMP GAS	10100' - 14518'	BHL IS IN THE AOR.
															9 7/8" 6 3/4"	7 5/8" 4 1/2"	9962' 14678'	2514 542	45' 9841'	Temp Surv Circ.			Top of liner at 9841'	
26	30-015-43843	OXY USA INC	CEDAR CANYON 16 STATE	34H	GAS	ACTIVE	402'	FNL	###	FEL	A 16 24 S 29 E	12/4/2016	10038'	14545'	14 3/4"	10 3/4"	447'	364	Surf	Circ.		PURPLE SAGE WOLFCAMP GAS	10125' - 14360'	BHL IS IN THE AOR.
															9 7/8" 6 3/4"	7 5/8" 4 1/2"	9995' 14526'	2325 510	Surf 9862'	Circ. Circ.			Top of liner at 9862'	
27	30-015-27092	OXY USA INC	H BUCK STATE	1	OIL	ACTIVE	1982'	FSL	###	FEL	J 16 24 S 29 E	9/26/1992	7850'	7850'	12 1/4"	8 5/8"	660'	425	Surf	Circ.		CEDAR CANYON; DELAWARE	5122'-7690'	SQZ @ 7610 & 7220 in 1994
															7 7/8"	5 1/2"	7850'	2312	2600'	Calc.	3972', 6179'			
28	30-015-28138	OXY USA INC	H BUCK STATE	2	OIL	ACTIVE	1980'	FNL	660'	FEL	H 16 24 S 29 E	11/9/1994	7950'	7950'	17 1/2"	13 3/8"	535'	1400	Surf	Circ.		CEDAR CANYON; DELAWARE	5216'-5246'	
															11" 7 7/8"	8 5/8" 5 1/2"	2805' 7950'	1200 1325	Surf 2440'	Circ. Calc	4665', 6372'			
29	30-015-33821	OXY USA INC	Harroun 22	3	OIL	ACTIVE	660'	FNL	330'	FEL	A 22 24 S 29 E	3/24/2006	7786'	10864'	17 1/2"	13 3/8"	506'	450	Surf	Circ.		PIERCE CROSSING BONE SPRING EAST	7863'-10720'	Lateral goes through the AOR.
															12 1/4" 8 1/2" x 7 7/8"	9 5/8" 5 1/2"	2914' 10819'	1100 2150	Surf 4670'	Circ. CBL				
30	30-015-34695	OXY USA INC	H BUCK STATE	10	OIL	ACTIVE	660'	FSL	330'	FEL	P 16 24 S 29 E	5/21/2016	7691'	10865	17 1/2"	13 3/8"	288'	1030	Surf	Circ		PIERCE CROSSING; BONE SPRING, EAST	8396' - 10710'	
															12 1/4" 8 1/2" X 7 7/8"	9 5/8" 5 1/2"	2910' 10865'	1300 2150	Surf 4870'	Circ CBL				
31	30-015-29233	OXY USA INC	Harroun 15	3	SWD	ACTIVE	1657'	FNL	330'	FEL	H 15 24 S 29 E	1/14/1997	8056'	8056'	14 3/4"	10 3/4"	504'	575	Surf	Circ.		SWD, DELAWARE	3041' - 3765'	
															9 7/8" 6 3/4"	7 5/8" 4 1/2"	2900' 8056'	800 510	Surf 1280'	Circ. CBL	4511' & 6226'			
32	30-015-29309	OXY USA INC	Harroun 15	4	OIL	ACTIVE	2260'	FSL	330'	FEL	I 15 24 S 29 E	2/22/1997	8022'	8022'	14 3/4"	10 3/4"	560'	600	Surf	Circ.		PIERCE CROSSING; BONE SPRING, EAST Cedar Canyon- Delaware	3822' - 3838' 4858' - 4866' 5114' - 5126' 5278' - 6680' 6836' - 7862' (BS)	Well originally completed in BS in 1997. Delaware perms added and wellbore downhole commingled with BS per DHC-3156 starting 7/17/2003. Note: BS perms in 1st BS.
															9 5/8"	7 5/8"	2900'	900	Surf	Circ.				

WELL ID NUMBER	API NUMBER	OPERATOR	LEASE NAME	WEL L	WELL TYPE	STATUS	FTG N/S	FTG E/W	UNIT	SECT	SHIP. RNG.	DATE DRILLED	TOTAL TVD	TOTA L MD	HOLE SIZE	CSG SIZE	SET AT	SX CM	CMT TOP	HOW MEASURE	DVT	CURRENT PROD POOL	CURRENT COMPLETION	ADDITIONAL INFORMATION	
															6 3/4"	4 1/2"	8022'	1524	2160	CBL	4493' & 6198'				
33	30-015-30614	OXY USA INC	Harroun 15	6	OIL	ACTIVE	1650' FNL	1650' FEL	G	15	24	S 29 E	5/10/1999	6890'	6890'	14 3/4"	10 3/4"	539'	486	Surf	Circ.		CEDAR CANYON; DELAWARE	5252' - 6303'	
															9 7/8" 6 3/4"	7 5/8" 4 1/2"	2883' 6890'	1050 1195	Surf 3242'	Circ. CBL		5406'			
34	30-015-30713	OXY USA INC	Harroun 15	9	OIL	ACTIVE	2260' FSL	1650' FEL	J	15	24	S 29 E	10/4/1999	6890'	6890'	14 3/4"	10 3/4"	548'	540	Surf	Circ.		CEDAR CANYON; DELAWARE	5064" - 6652'	
															9 7/8" 6 3/4"	7 5/8" 4 1/2"	2892' 6890'	900 1070	Surf 2000'	Circ. CBL		5585'			
35	30-015-30951	OXY USA INC	Harroun 15	11	OIL	ACTIVE	800' FSL	1900' FEL	O	15	24	S 29 E	9/8/2000	6890'	6890'	14 3/4"	10 3/4"	563'	545	Surf	Circ.		CEDAR CANYON; DELAWARE	5246' - 5264'	
															9 7/8" 6 3/4"	7 5/8" 4 1/2"	2930' 6890'	800 1115	Surf 3234'	Circ. CBL		5520'			
36	30-015-31711	OXY USA INC	Harroun 15	13	OIL	ACTIVE	660' FSL	360' FEL	P	15	24	S 29 E	8/9/2003	8020'	8020'	17 1/2"	13 3/8"	580'	1070	Surf	Circ.		CEDAR CANYON; DELAWARE	5282' - 5310' (Delaware) 7780' - 7802' (BS)	Well originally completed in Delaware in 2001. Added 1st BS pay in 2003, downhole commingled with Delaware per DHC-3155 starting 8/29/2003.
															11" 7 7/8"	8 5/8" 5 1/2"	2915' 8020'	1050 1830	Surf 1800'	Circ. CBL	n/a			DV tool run but no depth provided.	
37	30-015-28930	DEVON ENERGY PRODUCTION COMPANY, LP	ORE IDA 14 FEDERAL	2	OIL	ACTIVE	1980' FNL	330' FWL	E	14	24	S 29 E	4/11/1997	8350'	8350'	17 1/2"	13 3/8"	375'	705	Surf	Circ.		CEDAR CANYON; DELAWARE	4410' - 4418'	This well was originally drilled by Penwell Energy in 1997 and completed in the BS. Devon plugged off the BS and recompleted in the Delaware in 2005. NOI to P&A this well filed by Devon 8/20/2018. Old BS perms are isolated from everything else via CIBP and cement.
															12 1/4" 7 7/8"	8 5/8" 5 1/2"	3069' 8350'	1220 520	Surf 2895'	Circ. CBL		5507'			
38	30-015-43169	DEVON ENERGY PRODUCTION COMPANY, LP	NEW POTATO 11 FEDERAL COM	1H	OIL	ACTIVE	2324' FNL	641' FWL	E	11	24	S 29 E	11/13/2015	8903'	16576'	17 1/2"	13 3/8"	538'	555	Surf	Circ.		CEDAR CANYON BONE SPRING	9350' - 16505'	Lateral goes through the AOR
															12 1/4" 8 7/8"	9 5/8" 5 1/2"	3113' 16576'	1060 3515	Surf Surf	Circ. CBL		3499'			
39	30-015-29042	DEVON ENERGY PRODUCTION COMPANY, LP	ORE IDA 14 FEDERAL	3	OIL	ACTIVE	1830' FNL	2050' FWL	F	14	24	S 29 E	9/10/1996	8105'	8105'	17 1/2"	13 3/8"	360'	325	Surf	Circ		PIERCE CROSSING; BONE SPRING, EAST	7798' - 8002'	
															12 1/4" 7 7/8"	8 5/8" 5 1/2"	3079' 8100'	1090 990	Surf Surf	Circ Calc		5093'			
40	30-015-29417	SHACKELFORD OIL CO.	ORE IDA 14 FEDERAL	13	OIL	ACTIVE	660' FSL	1980' FWL	N	14	24	S 29 E	5/2/1997	8350'	8350'	17 1/2"	13 3/8"	354'	185	Surf	Circ		PIERCE CROSSING BONE SPRING EAST	7841' - 8019'	
															12 1/4" 7 7/8"	8 5/8" 5 1/2"	3066' 8350'	815 910	Surf 5600'	Circ Calc		5487'			
41	30-015-28390	OXY USA INC.	RIVERBEND FEDERAL	8	SWD	ACTIVE	460' FNL	330' FWL	D	23	24	S 29 E	12/16/1995	9000'	9000'	14 3/4" 9 7/8" 6 3/4"	10 3/4" 7 5/8" 4 1/2"	451' 2900' 9000'	470 700 1220	Surf Surf Surf	Circ Circ Calc		4570' and 6730'	3070' - 4470'	SWD WELL IN THE DELAWARE
																								Note: Plugs left in DV tools, never drilled out, so this well has a PBTd = 4570'	
42	30-015-44179	OXY USA INC.	CEDAR CANYON 23 24 FEDERAL	31H	OIL	ACTIVE	491' FNL	177' FEL	A	22	24	S 29 E	9/18/2017	10160'	17742'	14 3/4"	10 3/4"	422'	385	Surf	Circ		PIERCE CROSSING BONE SPRING EAST	10330' - 17558'	
															9 7/8" 6 3/4"	7 5/8" 4 1/2" 5 1/2"	9346' 17727' 9181'	1365 815	Surf 9181'	Circ Circ		3067'		Top of liner at 9181' 5 1/2" tie back string run after liner was set and cemented	
43	30-015-43282	OXY USA INC.	CEDAR CANYON 23 FEDERAL	5H	OIL	ACTIVE	1305' FNL	155' FEL	A	22	24	S 29 E	1/15/2016	9014'	16385'	14 3/4"	10 3/4"	444'	550	Surf	Circ		PIERCE CROSSING BONE SPRING EAST	9166' - 16263'	
															9 7/8" 6 3/4"	7 5/8" 5 1/2" X 4 1/2"	7675' 16370'	1570 1110	Surf 3380'	Circ CBL		3033'		5 1/2" crosses over to 4 1/2" at 9104'	
44	30-015-33821	OXY USA INC	Harroun 22	3	OIL	ACTIVE	660' FNL	330' FEL	A	22	24	S 29 E	3/24/2006	7786'	10864'	17 1/2"	13 3/8"	506'	450	Surf	Circ.		PIERCE CROSSING BONE SPRING EAST	7863'-10720'	
															12 1/4" 8 1/2" x 7 7/8"	9 5/8" 5 1/2"	2914' 10819'	1100 2150	Surf 4670'	Circ. CBL					
45	30-015-28354	OXY USA INC	CEDAR CANYON 21 FEDERAL	1	OIL	ACTIVE	660' FNL	330' FEL	A	21	24	S 29 E	4/9/1995	6766'	6766'	11"	8 5/8"	560'	450	Surf	Circ.		CEDAR CANYON; DELAWARE	5212' - 5242'	
															7 7/8"	4 1/2"	6766'	1790	Surf	Circ.		3491' & 5446'			
46	30-015-44182	OXY USA INC	CEDAR CANYON 21 FEDERAL COM	31H	OIL	ACTIVE	339' FNL	368' FEL	A	21	24	S 29 E	10/5/2017	9950'	14734'	14 3/4"	10 3/4"	456'	674	Surf	Circ		PURPLE SAGE WOLFCAMP GAS	9966' - 14562'	
															9 7/8" 6 3/4"	7 5/8" 4 1/2" 5 1/2"	9295' 14724' 9183'	1773 713	Surf 9183	Circ Circ		3007'		Top of liner at 9183' 5 1/2" tie back string run after liner was set and cemented	

From: "Brown, Verl" <Verl.Brown@devon.com>

Date: May 2, 2019 at 11:33:25 AM MDT

To: "john_schneider@oxy.com" <john_schneider@oxy.com>, "Peter_VanLiew@oxy.com" <Peter_VanLiew@oxy.com>

Subject: RE: [EXTERNAL] NMOCD hearing - Cedar Canyon 15 #3H

John and Peter,

Devon hereby waives its right to the notice period for the conversion of the Cedar Canyon 15 3H well in Section 15-24S-29E from a producing well to a gas injection well. Should you need any additional documentation or support for this waiver please let me know, and I will provide that documentation.

Regards,

Verl Brown

Landman

Devon Energy Production Company, L.P.