

**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. 20195
ORDER NO. R-21413**

ORDER OF THE DIVISION

This case came in for hearing before the Oil Conservation Division (“OCD”) at 8:15 a.m. on January 11, 2019, in Santa Fe, New Mexico.

The OCD Director, having considered the testimony, the record, the recommendations of Hearing Examiner Phillip R. Goetze, these findings of fact, and conclusions of law issues this Order.

FINDINGS OF FACT

1. Due notice has been given, and the OCD has jurisdiction of the subject matter of this case.
2. By this application, OXY USA, Inc. ("Applicant" or “OXY”) seeks approval of a pressure maintenance project in the 1st and 2nd sand intervals in the Bone Spring formation, Cedar Canyon, Bone Spring pool (Pool code 11520), within the following 640 acres, more or less, within Eddy County, New Mexico:

Township 23 South, Range 29 East, NMPM
Section 34

3. Applicant proposes to inject produced gas, produced water and produced CO2 into two existing horizontal oil wells: the existing Cypress 34 Federal No. 3H well and the Cypress 34 Federal No. 8H well.
4. The Cypress 34 Federal No. 3H well will benefit the Cypress 34 Federal No. 1 and the Cypress 34 Federal No. 2H at a true vertical depth interval from approximately 7896 feet to approximately 7949 feet below the surface, in the 1st Bone Spring sand interval.
 - (a) Cypress 34 Federal No. 3H (API No. 30-015-35692) with a surface location of 2100 feet from the South line and 1650 feet from the West line (Unit letter K) of Section 34, Township 23 South, Range 29 East, NMPM, and a terminus of 1980 feet from the South line and 330 feet from the East line (Unit letter I) of Section 34, Township 23 South, Range 29 East, NMPM.

5. The Cypress 34 Federal No. 8H well will benefit the Cypress 34 Federal No. 9H and the Cypress 34 Federal No. 11H at a true vertical depth interval from approximately 8658 feet to approximately 8910 feet below the surface, in the 2nd Bone Spring sand interval.

a) Cypress 34 Federal No. 8H (API No. 30-015-39430) with a surface location of 575 feet from the South line and 1980 feet from the East line (Unit letter O) of Section 34, Township 23 South, Range 29 East, NMPM, and a terminus of 326 feet from the North line and 2042 feet from the East line (Unit letter B) of Section 34, Township 23 South, Range 29 East, NMPM.

6. EOG Resources appeared through counsel at the hearing but did not oppose the application. No other party appeared at the hearing or otherwise opposed the application.

7. Applicant appeared through counsel and presented engineering testimony and exhibits to the effect that:

- (a) In this area of Eddy County, the 1st and 2nd Bone Spring sands are productive intervals within the Bone Spring formation and are well delineated and characterized.
- (b) The Cypress 34 Federal No. 3H (a “proposed injection well”) is a horizontal well in the Bone Spring formation that is producing from the 1st Bone Spring sand interval.
- (c) The Cypress 34 Federal No. 8H (a “proposed injection well”) is a horizontal well in the Bone Spring formation that is producing from the 2nd Bone Spring sand interval.
- (d) Applicant has designed a pressure maintenance project limited to Section 34 utilizing the two proposed injection wells to benefit offset existing horizontal oil wells.

The Cypress 34 Federal No. 3H will benefit the following wells: Cypress 34 Federal No. 1 (API No. 30-015-35053) and the Cypress 34 Federal No. 2H (API No. 30-015-35413). These are lay-down wells in the 1st Bone Spring sand interval.

The Cypress 34 Federal No. 8H will benefit the following wells: Cypress 34 Federal No. 9H (API No. 30-015-42088) and the Cypress 34 Federal No. 11H (API No. 30-015-42088) These are stand-up wells in the 2nd Bone Spring sand interval.

- (e) Applicant will utilize produced water for injection as a component of pressure maintenance in conjunction with the produced gas injection to mitigate early offset breakthrough at low injection pressures.
- (f) Applicant will utilize the proposed injection wells with existing perforations and well construction. Applicant additionally stated that the proposed injection wells will not be stimulated prior to the beginning of the pilot project.

- (g) Applicant provided analyses of the produced water and produced gas along with testimony demonstrating compatibility with well components and the reservoir conditions.
- (h) Applicant has proposed maximum surface injection pressures for each injection fluid for the Cypress 34 Federal No. 3H: 1580 pounds per square inch (psi) for produced water, 3850 psi for produced gas and 2000 psi for carbon dioxide. Applicant submitted pressure analyses in support of the proposed maximum surface injection pressures.
- (i) Applicant has proposed maximum surface injection pressures for each injection fluid for the Cypress 34 Federal No. 8H: 1730 pounds per square inch (psi) for produced water, 4350 psi for produced gas and 2300 psi for carbon dioxide. Applicant submitted pressure analyses in support of the proposed maximum surface injection pressures.
- (j) Applicant has proposed the placement of the packers in the vertical part of the production casing but significantly above the first perforations located in the horizontal portion of the production casing. Applicant requested an exception for the 100-foot packer setting depth requirement applied to vertical injection wells.
- (k) Applicant has requested that unlined tubing be allowed for use in the injection operation of produced gas and CO₂ and lined tubing when injecting water. Applicant stated that the unlined tubing would be preferable due to the increased use of wireline equipment in the proposed injection well, and the lack of significantly corrosive fluids being used for injection.
- (l) Applicant established a modified area of review (AOR) using the horizontal segment of each well (as defined by the surface location, the first take point, and the terminus) as the center line for the one-half mile radius, the AOR being defined as the area within one-half mile of any point on the horizontal well lateral. Applicant examined the injection interval and any part of the wellbore penetrating the Bone Spring formation. All wells in the two AORs, both producing and the plugged wells, are properly cemented.
- (m) Applicant found no freshwater wells within one mile of the proposed injection wells.
- (n) Applicant has provided proper notice to affected persons including the surface landowner. Applicant has also published notice of the pilot project in Carlsbad Current-Argus, a newspaper with general circulation in the county where the project is located.

CONCLUSIONS OF LAW

- (1) All of the wells (active and plugged) in the one-half mile modified AOR surrounding the proposed injection wells appear to be adequately cased and cemented, so that none will become a conduit for the escape of injected fluid or gas from the permitted injection formation. Accordingly, there is no requirement for remedial work on any wells within the modified AOR for each of the injection wells.

- (2) Applicant should be authorized to inject fluids at a surface injection pressure for each of the wells:
 - (a) Cypress 34 Federal No. 3H: 1580 pounds per square inch (psi) for produced water, 3850 psi for produced gas and 2000 psi for carbon dioxide.
 - (b) Cypress 34 Federal No. 8H: 1730 pounds per square inch (psi) for produced water, 4350 psi for produced gas and 2300 psi for carbon dioxide.
- (3) Applicant may apply to the OCD for a higher injection pressure upon satisfactorily demonstrating that an increase in injection pressure will not result in fracturing of the injection formation or confining strata.
- (4) The proposed project will, in reasonable probability, result in production of substantially more hydrocarbons from the project area that would otherwise be produced therefrom, will prevent waste, and will not impair correlative rights.
- (5) Accordingly, the application should be approved.

ORDER

- (1) OXY USA, Inc. ("OXY" or "operator") is hereby authorized to inject produced water and produced gas into the Bone Spring formation [Cedar Canyon, Bone Spring pool (Pool code 11520)], at two vertical depth intervals from approximately 7896 feet to approximately 7949 feet below the surface in the 1st Bone Spring sand interval and from approximately 8658 feet to approximately 8910 feet below the surface in the 2nd Bone Spring sand interval, through two of its horizontal wells located within the Cedar Canyon Federal 23 Lease.
- (2) This project is hereby designated the Cedar Canyon Pressure Maintenance Pilot Project and shall consist of the Bone Spring formation underlying the following lands in Eddy County, New Mexico:

Township 23 South, Range 29 East, NMPM
Section 34

- (3) OXY USA, Inc. (OGRID 16696) is designated operator of the project.
- (4) The following existing horizontal wells (the "injection well") are approved for injection:

- (a) Cypress 34 Federal No. 3H (API No. 30-015-35692) with a surface location of 2100 feet from the South line and 1650 feet from the West line (Unit letter K) of Section 34, Township 23 South, Range 29 East, NMPM, and a terminus of 1980 feet from the South line and 330 feet from the East line (Unit letter I) of Section 34, Township 23 South, Range 29 East, NMPM.
- (b) Cypress 34 Federal No. 8H (API No. 30-015-39430) with a surface location of 575 feet from the South line and 1980 feet from the East line (Unit letter O) of Section 34, Township 23 South, Range 29 East, NMPM, and a terminus of 326 feet from the North line and 2042 feet from the East line (Unit letter B) of Section 34, Township 23 South, Range 29 East, NMPM.
- (5) The operator shall take all steps necessary to ensure that the injected fluid enters only the injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.
- (6) The injection wells shall use the existing construction with injection occurring through perforations currently in place.
- (7) Water from outside the operator's Cedar Canyon Treating Facility shall not be injected into these wells. The operator shall utilize its Cedar Canyon Central Delivery Point for the source of the produced gas to be used in the injection phases of the pilot project.
- (8) Injection shall be accomplished through tubing installed in a packer set in the production casing so as to provide a proper seal. Applicant has proposed the placement of the packer in the vertical portion of the production casing at a depth of approximately 7400 feet for the Cypress 34 Federal No. 3H and at a depth of approximately 8200 feet for the Cypress 34 Federal No. 8H. This depth is more than 100 feet above the first perforation in the horizontal part of the well bores. Applicant requested an exception for the 100-foot packer setting depth requirement applied to vertical injection wells.
- (9) The injection wells shall be initially equipped with a pressure control device or acceptable substitute that will limit the maximum surface injection pressure for the Cypress 34 Federal No. 3H to no more than 1580 pounds per square inch (psi) for produced water, 3850 psi for produced gas and 2000 psi for carbon dioxide, and for the Cypress 34 Federal No. 8H to no more than 1730 pounds per square inch (psi) for produced water, 4350 psi for produced gas and 2300 psi for carbon dioxide.
- (10) The casing-tubing annulus in each injection well bore shall be filled with an inert fluid, and a gauge or approved leak-detection device shall be attached to the annulus in order to detect leakage in the casing, tubing or packer.
- (11) The injection wells shall pass a mechanical integrity test prior to initial commencement of injection and prior to resumption of injection each time the packer is unseated. All testing procedures and schedules shall conform to the requirements of Rule 19.15.26.11(A) NMAC. The Division Director retains the right to require at any time wireline verification of completion and packer setting depths.

(12) The injection wells shall be monitored with a SCADA system and the operator shall ensure that additional sensor systems for each injection well, as proposed in the C-108 application, are installed and monitored.

(13) The Division Director shall have the authority to administratively authorize an increase in injection pressure upon a showing by the operator that such higher pressure will not result in fracturing of the injection formation or confining strata. The operator shall give at least 72 hours advance notice to the supervisor of the OCD's District II office of the date and time (i) injection equipment will be installed, and (ii) the mechanical integrity pressure test will be conducted, so these operations may be witnessed.

(14) The operator shall provide written notice of the date of commencement of injection into each of the wells to the OCD's District II office.

(15) The operator shall immediately notify the supervisor of the OCD's District II office of the failure of the tubing, casing or packer in either injection well, or the leakage of water, oil, gas or other fluid from or around any producing or abandoned well within one-half mile of either injection well, and shall take all steps as may be timely and necessary to correct such failure or leakage.

(16) The Project shall be governed by OCD Rules 19.15.26.8 through 19.15.26.15 NMAC. The operator shall submit monthly reports of the injection operations on OCD Form C-115, in accordance with Rules 19.15.26.13 and 19.15.7.28 NMAC.

(17) The injection authority granted herein shall terminate two years after the effective date of this order if the operator has not commenced injection operations; provided, however, the OCD, upon written request by the operator filed prior to the expiration of the two-year time period, may grant an extension for good cause.

(18) The operator shall provide written notice to the OCD upon permanent cessation of injection into the Project.


(19) This Order does not relieve the operator of responsibility should its operations cause any actual damage or threat of damage to protectable fresh water, human health or the environment; nor does it relieve the operator of responsibility for complying with applicable OCD rules or other state, federal or local laws or regulations.

(20) Upon failure of the operator to conduct operations (1) in such manner as will protect fresh water or (2) in a manner consistent with the requirements in this Order, the OCD may, after notice and hearing (or without notice and hearing in event of an emergency, subject to the provisions of NMSA 1978 Section 70-2-23), terminate the injection authority granted herein.

(21) Jurisdiction of this case is retained for the entry of such further orders as the OCD may deem necessary.

DONE at Santa Fe, New Mexico, on this 12th day of August, 2020.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

A handwritten signature in black ink, appearing to read 'ASD', is written over a horizontal line.

ADRIENNE SANDOVAL
DIRECTOR