

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

**IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION TO CONSIDER:**

**APPLICATION OF FORTY ACRES ENERGY, LLC FOR APPROVAL OF A
SECONDARY RECOVERY PROJECT AND TO QUALIFY THE PROJECT FOR
THE RECOVERED OIL TAX RATE, LEA COUNTY, NEW MEXICO**

**CASE NO. 15793
ORDER NO. R-14616**

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on September 14, 2017 at Santa Fe, New Mexico before Examiner William V. Jones.

NOW, on this 2nd day of April, 2018, the Division Director, having considered the testimony, the record and the recommendations of the Examiner,

FINDS THAT:

(1) Due public notice has been given and the Division has jurisdiction of this case and its subject matter.

(2) For purposes of hearing, this case was consolidated with Case No. 15792, *Application of Forty Acres Energy, LLC for statutory unitization, Lea County, New Mexico*. A separate order is being entered in Case No. 15792.

(3) Forty Acres Energy, LLC ("Forty Acres" or "Applicant"), seeks approval to install a secondary recovery (waterflood) project within its proposed West Eumont Unit and to qualify the project for the Recovered Oil Tax Rate.

(4) Applicant is a working interest owner in the proposed West Eumont Unit which covers the following described 7977.30 acres (more or less) of federal, state, and fee lands in Lea County, New Mexico:

Township 20 South, Range 36 East, NMPM

Section 21: S/2
Section 22: NE/4 and S/2

Sections 26-28: All
Section 29: NE/4
Section 32: E/2
Sections 33-35: All

Township 21 South, Range 35 East, NMPM

Section 1: Lots 3-6 and 11-14, and SW/4 (W/2 Equivalent)
Section 2: Lots 1-16 and S/2 (All)
Section 3: Lots 1-16 and S/2 (All)
Section 11: N/2
Section 12: NW/4

(5) Applicant will be the operator of the Unit and proposes to institute a secondary recovery project in the Unit Area.

(6) Laurel Seth and Sandy Seth, COG Operating LLC, SCR Energy Capital, LLC, Big Al Oil & Gas, ConocoPhillips Company, and OXY USA, Inc. all entered appearances in this case but were not present at the hearing. Bradley McInroe with Big Al Oil & Gas sent a letter asking to appear and present in the cases but was not present at the hearing. No other party appeared or otherwise opposed this application.

(7) Applicant intends to begin injection into the following seven wells (the "Proposed Wells"). All injection wells within the Unit are anticipated to be new drills.

The following three wells will be in T20S, R36E, NMPM

WEU 2600-W,	30-025-Pending,	10' FSL, 2660' FEL,	Unit N, Sec 26
WEU 35BB-W,	30-025-Pending,	1330' FNL, 2630' FEL,	Unit G, Sec 35
WEU 35GG-W,	30-025-Pending,	2470' FSL, 2630' FEL,	Unit J, Sec 35

The following four wells are in Irregular Section 2, T21S, R35E, NMPM

West Eumont Unit Well No. 211, 30-025-44207, 1185' FNL, 1345' FEL, Lot 2/Unit B
West Eumont Unit Well No. 212, 30-025-44208, 1185' FNL, 2580' FEL, Lot 2/Unit B
West Eumont Unit Well No. 213, 30-025-44209, 2330' FNL, 2620' FEL, Lot 7/Unit B
West Eumont Unit Well No. 214, 30-025-44210, 2485' FNL, 1335' FEL, Lot 7/Unit B

(8) Each of the Proposed Wells will have 8-5/8-inch surface casing set to 1650 feet and cemented with cement to surface. Then, 5-1/2-inch casing will be set to approximately 4100 feet and circulated with cement to surface. The wells will be selectively perforated for injection from approximately 3800 feet to 4100 feet. For reference, the Unitized Formation extends from the top of the Yates formation at approximately 3100 feet, to a lower limit at the base of the Queen formation at approximately 4200 feet.

(9) Applicant appeared at the hearing through counsel and presented the following geological testimony:

- (a) Applicant is interested in multiple producing intervals for waterflooding within the Yates, Seven Rivers, and Queen formations of the Eumont; Yates-7 Rvrs-Queen Pool [Pool Codes 22800 (oil) and 76480 (gas)].
- (b) The gross thickness of the unit is 1200 feet and all within the bounds of the established Eumont Pool. The lower Yates sand, the Bowers sand within the Seven Rivers, and the Penrose member of the Queen are all targets. All three main targets are continuous across the Unit area and considered prospective for waterflooding.
- (c) The Unit is in the back-reef area, so there are sands and dolomitic sands interbedded with tighter dolomites and anhydrites. The similar looking Queen formation disappears one or two miles to the east as the Goat Seep reef complex takes over. The Yates and Seven Rivers formations extend much further to the east before transitioning into the Capitan Reef complex.
- (d) The lower Yates formation climbs to shallower depths from west to east across the Unit area and becomes increasingly gassy. The facies become thinner to the southwest.
- (e) The proposed Unit is bounded nearby to the east by a Grayburg-San Andres formation waterflood. There is a Queen formation waterflood to the north. The Cooper-Jal waterflood to the south is within the proposed formations.
- (f) The Tansill, Salado, and Rustler formations overlie the Unitized formations. The Salado is approximately 150 feet above the top of the Yates formation. The upper Yates formation is tight and considered a barrier to upward migration of waters and is therefore expected to protect the Salado formation.
- (g) The fresh water Ogallala and Dockum aquifers overlie the Unit Area, and are found at depths of 40 to 250 feet, respectively, below the surface.
- (h) There are no apparent faults connecting the unitized interval to the Ogallala or any other fresh water bearing formation.
- (i) The electric logs are generally of the older variety and were located through several sources including the Division's web site. The injection wells will be new drills and will have the newer logs. The log for the type well is not available on the web site, but is being presented by the Applicant in the Unit Agreement.

(10) Applicant presented the following engineering testimony:

- (a) Based on work by a third-party engineering firm and on analogy of other waterfloods with one injector and one producer per forty acres, Applicant expects a secondary to primary ultimate oil recovery ratio of one and one half to one. The ultimate primary recovery is expected to be 12 million barrels and ultimate secondary recovery is expected to be 18 million barrels.
- (b) The Eumont Pool is a solution-gas-drive reservoir and is in an advanced state of decline with many plugged and abandoned wells and an average cumulative oil recovery of 80,000 barrels per well. There have been 140 wells drilled within the proposed Unit area, and currently there remain 52 active wells. Applicant has spent money on older wells and has raised production within the Unit area to approximately 80 barrels of oil per day.
- (c) Applicant intends to begin with pilot projects, drill all new wells for injection and effectively down-space to 40-acre 5-spots (20-acre well density).
- (d) Within the proposed Unit, the reservoir is in an advanced state of depletion. Initially Applicant expects the injection wells to take on average 350 to 400 barrels of make-up water per day on a vacuum for longer than one year. The voidage calculation is difficult because of the lack of definitive porosity data. The make-up water will be from some of the same formations and has been tested and is compatible with *in situ* reservoir waters.
- (e) The revenue from the project is expected to exceed the costs plus a reasonable profit. The waterflood is expected to increase production in existing wells, and those wells should qualify for the recovered oil tax rate.
- (f) Applicant proposes initially to use seven wells for injection and begin injection in the deeper prospective intervals. Within one-half mile of those seven proposed wells are 14 plugged and abandoned and 33 non-plugged wells. All Area of Review wells have casing and cement in place which adequately isolates the proposed waterflood interval.
- (g) All fresh water wells have been identified within two miles of the proposed injection wells. There are no wells within one-half mile.
- (h) The proposed secondary recovery operation is economically and technically feasible.

(11) Applicant has notified the other working interest owners within the West Eumont Unit and all parties affected by injection into the Proposed Wells and received no objections.

(12) The proposal to install a secondary recovery (waterflood) project within the West Eumont Unit is feasible and should result in the recovery of additional oil and gas that would not otherwise be recovered.

(13) The proposed project will prevent waste, protect correlative rights, and should be approved and called the West Eumont Unit Secondary Recovery Project. The area to be affected by these operations (the project area) should consist of the entire West Eumont Unit area.

(14) At this date, Forty Acres Energy, LLC (OGRID 371416) is in compliance with Division Rule 19.15.5.9 NMAC and therefore is eligible for approval of injection permits.

(15) The Proposed Wells should be approved for use as injection wells within the Unit at the depths and with the casing and tubing proposed in the application.

(16) Provisions should be made for the operator of the Unit to apply administratively for approval of additional injection at the proposed depths (approximately 3800 feet to 4100 feet) specified in its application into water injection wells. The injection pressure limit ("MSIP") for the wells in this waterflood project should be set initially at **760 psi** which is a gradient of 0.2 psi/foot above the 3800-foot proposed injection interval.

(17) Any existing salt water disposal wells disposing into the unitized interval within the Unit shall be considered as part of the waterflood and shall have the well types changed to water injection by submittal of the operator of forms C-103 and C-108 to the Santa Fe office of the Division.

(18) Approval of this project should include a requirement to work with District personnel as to frequency of MIT testing and providing charts of annulus and tubing pressures and rates obtained from the automation system.

(19) This application for this secondary recovery project has not been prematurely filed for economic or technical reasons, and the area to be affected has been so depleted that it is prudent to apply enhanced recovery techniques to maximize the ultimate recovery of crude oil from the unit area.

(20) Forty Acres presented exhibits containing the information required by Division rules to qualify this project under the Enhanced Oil Recovery Act.

(21) The evidence establishes that the project meets all the criteria for certification by the Division as a qualified "Enhanced Oil Recovery (EOR) Project"

pursuant to the "Enhanced Oil Recovery Act" (NMSA 1978 Sections 7-29A-1 through 7-29A-5). The certified project area should consist of the entire West Eumont Unit area.

(22) The EOR project area and/or the producing wells within this area eligible for the recovered oil tax rate may be contracted or expanded depending upon the evidence presented by the applicant in its demonstration of the occurrence of a positive production response.

IT IS THEREFORE ORDERED THAT:

(1) Forty Acres Energy, LLC ("Operator") [OGRID 371416] is hereby authorized to implement secondary recovery operations within the West Eumont Unit, described in Finding Paragraph No. (4), by injection of water into the Yates, Seven Rivers, and Queen formations, Eumont; Yates-7 Rvrs-Queen Pool [Pool Codes 22800 (oil) and 76480 (gas)].

(2) The West Eumont Unit Secondary Recovery Project is hereby approved and shall consist of the entire West Eumont Unit and shall be contained vertically within that Unitized interval.

(3) The seven Proposed Wells as detailed in the Findings Paragraph No. (7) of this order are approved for use as injection wells at approximate depths of 3800 feet to 4100 feet and with tubulars as proposed in the application. The injection authority for the three Proposed Wells that have not yet been permitted for drilling shall expire within one year of the date of this order if not permitted for drilling at that date.

(4) The Division Director may administratively authorize additional injection wells within this Unit after proper notice and opportunity for hearing as provided in 19.15.26.8 NMAC with the provision that all injection wells shall conform to the following requirements and the operator is in compliance with Division Rule 19.15.5.9 NMAC.

(5) Any previously approved salt water disposal wells within this project and within any portions of the vertical limits of the Unit shall have the well type(s) changed from salt water disposal to water injection. The operator shall address these well type changes within one year of the date of this order by submittal of form C-108 to the Santa Fe office of the Division.

(6) Water injection in this project is allowed only through perforations in casing and not into an open hole interval. Injection shall be through plastic lined tubing no larger in outside diameter than 2-7/8 inch, set into a packer set no further than 100 feet of the top of each respective injection interval.

(7) The operator shall take all steps necessary to ensure that the injected fluids enter only the permitted injection intervals and are not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(8) The casing-tubing annulus shall be filled with an inert fluid, and a gauge or approved leak-detection device shall be attached to the annulus to detect any leakage in the casing, tubing, or packer.

(9) Each injection well or the connected injection system shall be equipped with a pressure control device or acceptable substitute that will limit the maximum surface injection pressure on all wells to 760 psi.

(10) The Division Director may administratively authorize a pressure limitation in excess of the above, upon a showing supported by approved Step Rate Tests that such higher pressure will not result in the fracturing of the injection formation or confining strata or damage to the reservoir.

(11) As per Division Rule 19.15.26.11A NMAC, the operator shall test any injection well on this project for mechanical integrity ("MIT") prior to commencing injection into that well and prior to resuming injection each time the packer is unseated. All MIT testing procedures and schedules shall follow the requirements in Division Rule 19.15.26.11A. NMAC or with added provisions as may be required by the District office of the Division, such as continuous data gathering of tubing and casing pressures, temperatures, and injection rates. The Division Director retains the right to require at any time wireline verification of completion and packer setting depths in any injection well.

(12) The operator shall provide notice, 72 hours in advance, to the supervisor of the Division's district office of the date and time of the installation of injection equipment and of any mechanical integrity test so that the same may be inspected and witnessed.

(13) The operator shall provide written notice of the date of commencement of injection to the Division's district office. In accordance with Division rules, the operator shall submit monthly reports of the disposal operations on Division Form C-115.

(14) Without limitation on the duties of the operator as provided in Division rules, or otherwise, the operator shall immediately notify the Division's district office of any failure of the tubing, casing or packer in the well, or of any leakage or release of water, oil or gas from around any produced or plugged and abandoned well in the area, and shall take such measures as may be timely and necessary to correct such failure or leakage.

(15) The West Eumont Unit Secondary Recovery Project is hereby certified to the New Mexico Taxation and Revenue Department as an "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (NMSA 1978 Sections 7-29A-1 through 7-29A-5).

(16) The area to be affected by the enhanced oil recovery project shall consist of the area within the West Eumont Unit; provided, the area and/or the producing wells eligible for the enhanced oil recovery (EOR) tax rate may be contracted or expanded based upon the evidence presented by the unit operator in its demonstration of a positive production response.

(17) At such time as a positive production response occurs, and within five years from the date the project was certified to the New Mexico Taxation and Revenue Department, the unit operator must apply to the Division for certification of a "positive production response." This application for "positive production response" shall identify the area benefiting from enhanced oil recovery operations and the specific wells eligible for the EOR tax rate.

(18) The Division may review the application administratively or set it for hearing. Based upon the evidence presented, the Division will certify to the New Mexico Taxation and Revenue Department those wells that are eligible for the EOR tax rate.

(19) The injection authority granted under this order is not transferable except upon Division approval. The Division may require the operator to demonstrate mechanical integrity of any injection well that will be transferred prior to approving transfer of authority to inject.

(20) The Division may revoke any injection permit after notice and hearing if the operator is in violation of 19.15.5.9 NMAC.

(21) The injection authority granted herein shall terminate two years after the effective date of this order if the operator has not commenced injection operations into at least one injection well, provided however, the Division, upon written request, mailed by the operator prior to the termination date, may grant an extension thereof for good cause.

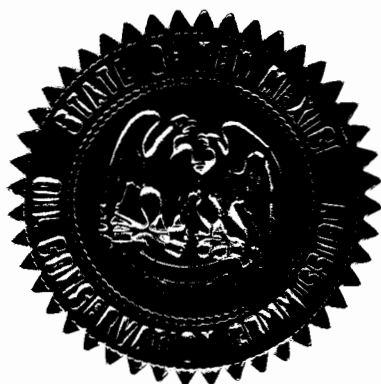
(22) One year after all timely reported water injection into the West Eumont Unit has ceased, the Division shall consider the project abandoned, and the authority to inject will terminate *ipso facto*. The Division, upon written request mailed by the operator prior to that termination date, may grant an extension thereof for good cause.

(23) The operator of the West Eumont Unit shall appear before the Division in the year 2022 (five years from the order date) and update the Division on the progress, production results, and expected plans of this waterflood. The progress report shall include an engineering analysis of the state of the waterflood.

(24) Compliance with this order does not relieve the operator of the obligation to comply with other applicable federal, state or local laws or rules, or to exercise due care for the protection of fresh water, public health and safety and the environment.

(25) Jurisdiction is retained by the Division for the entry of such further orders as may be necessary for the prevention of waste and/or protection of correlative rights or upon failure of the operator to conduct operations (1) to protect fresh or protectable waters or (2) consistent with the requirements in this order, whereupon the Division may, after notice and hearing (or without prior notice and hearing in case of emergency), terminate the injection authority granted herein.

DONE in Santa Fe, New Mexico, on the day and year hereinabove designated.



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STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

A handwritten signature in cursive script that reads "Heather Riley".

HEATHER RILEY
Director