

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

**APPLICATIONS OF GOODNIGHT MIDSTREAM
PERMIAN, LLC FOR APPROVAL OF
SALTWATER DISPOSAL WELLS
LEA COUNTY, NEW MEXICO**

CASE NOS. 23614-23617

EMPIRE’S PRE-HEARING STATEMENT

Empire New Mexico LLC (“Empire”) provides this Pre-Hearing Statement as required by the Rules of the Division.

APPEARANCES

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STATEMENT OF THE CASE

In these four applications, Applicant Goodnight Midstream Permian, LLC (“Applicant” or “Goodnight”) seeks orders authorizing injection of produced saltwater for purposes of disposal in the San Andres formation [SWD; San Andres (Pool Code 96121)] between approximately 4,100 and 5,300 feet below the ground. Goodnight proposes to drill all four wells¹ within the Eunice Monument South Unit (“EMSU”), which Empire operates.

Goodnight proposes to inject produced water into the EMSU unitized interval at a maximum injection rate of 42,000 bpd, average injection rate of 27,500 bpd, maximum injection pressure of 840 psi (surface), and average injection pressure pf 537 psi (surface). Applicant proposes to inject high salinity saltwater from the Delaware Mountain Group, Wolfcamp, and Bone Spring formations into the low salinity Grayburg -San Andres formation.

The unitized interval of the EMSU extends from the top of the Grayburg formation to the base of the San Andres formation. The vertical limits of the unitized interval are the same as the

¹ In **Case No. 23614**, Goodnight proposes to drill the **Doc Gooden SWD #1**, located in Unit J, Section 3, T21S, R36E. In **Case No. 23615**, Goodnight proposes to drill the **Hernandez SWD #1**, located in Unit P, Section 10, T21S, R36E. In **Case No. 23616**, Goodnight proposes to drill the Seaver SWD #1, located in Unit K, Section 10, T21S, R36E. In **Case No. 23617**, Goodnight proposes to drill the **Hodges SWD #1**, located in Lot 11, Section 4, T21S, R36E.

vertical limits of the Eunice Monument Grayburg-San Andres Pool covering the Grayburg and San Andres formations. The EMSU 14,189.84-acre Unit was formed December 27, 1984 and water injection began November, 1986. Currently, Empire operates the EMSU as a water flood project recovering hydrocarbons from the Grayburg – San Andres formation. The EMSU waterflood currently produces approximately 830 BOPD; 67,600 BWPD; 540 MCFPD and injects approximately 67,600 BWPD into the unitized Grayburg / San Andres Reservoir. Empire plans to further develop the EMSU through CO₂ injection to enhance recovery in the Grayburg & San Andres formation and to recover oil within residual oil zones (“ROZ”) in the San Andres formation. By CO₂ flooding this San Andres ROZ interval it is estimated that 270 million barrels or more of this residual oil can be recovered, in addition to an estimated 300 million barrels of tertiary oil recovered from the Grayburg.

As will be explained in detail at the hearing, the proposed injection will adversely affect Empire’s operations of the EMSU in at least five ways. First, the proposed injection will impair Empire’s ability to recover hydrocarbons from the residual oil zones (“ROZ”) in the San Andres formation through CO₂ injection and the Grayburg formation. Among other things, the added volume of water into the unitized interval will require Empire to displace the large volumes of water disposed by Goodnight and inject at higher pressures during the CO₂ flood. Empire will be required to displace an estimated 1.0 to 1.5 billion barrels of disposal water and then reinject it, thus increasing Empire’s operating cost for reinjection of the produced water and increasing corrosion and lease operating expenses.

Second, vertical fractures allow communication between the San Andres and Grayburg formations. High salinity water injected into the San Andres will migrate up to impair existing waterflood operations in the Grayburg formation by causing increased corrosion rates and scaling,

and greatly higher lifting costs. Notably, disposal into the San Andres portion of Empire's unitized interval using the proposed saltwater disposal (SWD) wells will reach Empire's San Andres water supply wells (EMSU-278 and EMSU-459), which are less than 4000 feet away- with damage starting in 13 days. Further, the high salinity water will migrate down-dip into the Goat Seep Aquifer and contaminate a source of low salinity water (<10,000 ppm) in the Chihuahuan Desert. This damage to an important freshwater aquifer is a major environmental liability to New Mexico, its citizens and state and federal lands.

Third, injection of large volumes of water into the San Andres formation will prematurely water out Empire's wells, resulting in the loss of oil & gas, vastly increased operating costs, and increased plugging and abandonment liabilities decades sooner. Fourth, injection of such volumes preclude potential storage of CO₂ for use in recovery of hydrocarbons in both the San Andres and the Grayburg formations. This is the largest carbonate reservoir in the State of New Mexico and the second largest in the USA. The water would result in vast financial losses to state and federal lands and Empire. Fifth, injection of large water volumes will cause higher pressures in the ROZ, and higher potential for hydraulic fracturing and vertical communication, thereby impairing Empire's ability to produce hydrocarbons.

All of these issues are compounded and exacerbated by Goodnight's current disposal of saltwater in the Grayburg - San Andres formation by Goodnight using numerous other injection wells, including several located within the EMSU and others located within approximately one to two miles of the EMSU. Goodnight's active wells located within the EMSU include the Andre Dawson SWD #1 (30-025-50634), the Sosa SWD #1(30-025-47947), and the Ryno SWD #1, f/k/a Snyder SWD (30-025-43901). Active Goodnight disposal wells within one mile of the EMSU include the Yaz SWD #1 (30-025-46382), the Ted SWD #1(30-025-44386), the Pedro SWD #1

(30-025-50079), the Nolan Ryan SWD #1 (30-025-45349), and the Penroc State E TR #2 (30-025-26491). Goodnight is currently seeking to increase the injection rate for the Andre Dawson SWD #1 in pending Case No. 23775. In addition, Goodnight has permitted the Verlander SWD #1 (30-025-50632), which is also located within one mile of the EMSU. Further, in pending Case No. 22626, Goodnight proposed the Piazza SWD #1 to be located within the EMSU, which case was heard on September 15, 2022.

In sum, Goodnight’s proposed wells will result in waste of hydrocarbons and thereby violate the correlative rights of Empire and other interest owners in the EMSU. The applications should therefore be denied.

MATERIAL FACTS

The locations and parameters of the proposed wells are undisputed. The core disputed facts are: (1) whether recoverable hydrocarbons exist in the San Andres and (2) whether the disposal of saltwater as proposed by Goodnight impairs the ability of Empire, as the operator of EMSU, to recover the hydrocarbons found within the unitized interval of the EMSU.

PROPOSED EVIDENCE

APPLICANT:

WITNESSES

EST. TIME

EXHIBITS

TBD

EMPIRE (OPPOSING PARTY):

WITNESSES

VP – Land and Legal Jack E. Wheeler

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Consulting Geologist Robert F. Lindsay

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Consulting Geological Engineer Laurence S. Melzer

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Consulting Engineer Frank J. Marek	4
Consulting Chemical Engineer Galen Dillewyn	2
Petroleum Geologist Nicholas A. Cestari	7
Senior VP of Operations William West	21

The qualifications and full narrative of the direct testimony and exhibits for each witness will be filed concurrently with this Pre-Hearing Statement. Empire provides a summary of each witness's testimony below.

Jack E. Wheeler (VP – Land and Legal) is employed by Empire and will testify regarding (1) the creation and history of the EMSU, Empire's acquisition of its interests in the EMSU, and Empire's operations therein, (2) Division orders relating to the EMSU, and (3) the locations of Goodnight's proposed and currently active or permitted SWDs within the EMSU.

Robert F. Lindsay (Consulting Geologist, Lindsay Consulting) will testify to his characterization of the geology of the San Andres/Grayburg reservoir, including (1) the presence of a residual oil zone (ROZ) within the San Andres, (2) identifiable vertical fractures and plumes that can allow vertical migration into the San Andres ROZ of fluids injected into the Grayburg, (3) the lack of an effective geologic seal between the Grayburg and the San Andres, and (4) the manner in which the injection of high-salinity produced saltwater into the San Andres may both communicate upsection into the Grayburg reservoir through fractures, impairing existing waterflood operations, and work its way down-dip into the Goat Seep aquifer and contaminate this low-salinity water source.

Laurence S. Melzer (Consulting Geological Engineer, Melzer CO2 Consulting) will testify about (1) the use of enhanced oil recovery techniques including CO2 to recover previously-unproduced ROZs around the world, including in the Permian Basin, (2) his estimates of recoverable ROZ resources in Lea County, New Mexico, and (3) how SWD injection into ROZ reservoirs such as the San Andres ROZ will severely impair the ROZ for both oil exploration and CO2 storage, thus creating waste.

Frank J. Marek (Consulting Engineer, Cobb & Associates) will testify to his evaluation of the impact of existing SWD operations on waterflood projects in the EMSU, including (1) his analysis of cross-sections across the Unit showing oil saturation throughout the entire San Andres interval, and (2) the ways in which injection and further injection of produced water into the unitized interval detrimentally impact Empire's ability to recover hydrocarbons from the ROZ and therefore results in waste.

Galen Dillewyn (Consulting Chemical Engineer, NUTECH Energy Alliance) will testify to his analysis of the San Andes/Grayburg reservoir's quality, porosity, permeability and

saturation using the NUTECH/NULOOK process.

Nicholas A. Cestari (Empire Petroleum Geologist) is employed by Empire and will testify to his experience reviewing and studying the unitized Grayburg/San Andres interval in the EMSU, including (1) a geologic overview of the EMSU, (2) cross-sections showing proposed and active Goodnight wells injecting into the unitized interval, (3) subsea structure maps of the Grayburg and San Andres, (4) NUTECH log analysis, (5) proof of the ROZ in the San Andres, including geochemical evidence, (6) the EMSU 200H landing zone, and (7) the lack of geologic barrier between the Grayburg and San Andres.

William West (Senior Vice-President of Operations) will testify about (1) the volumes of Goodnight's SWD injections to date and their quantifiable impacts on EMSU secondary recovery operations, (2) evidence of communication between the San Andres and Grayburg formations, (3) the estimated area of exposure of SWD saltwater within the EMSU, (4) SWD impacts on secondary and tertiary recovery projects going forward, and (5) Goodnight's violation of an existing permit.

PROCEDURAL MATTERS

This matter is set for a contested hearing on November 2, 2023. Empire's witnesses will be available for cross-examination.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was served on the following
by electronic mail on October 26, 2023:

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QUESTIONS

Action 279964

QUESTIONS

Operator: Empire New Mexico LLC 2200 S. Utica Place Tulsa, OK 74114	OGRID: 330679
	Action Number: 279964
	Action Type: [HEAR] Prehearing Statement (PREHEARING)

QUESTIONS

Testimony	
<i>Please assist us by provide the following information about your testimony.</i>	
Number of witnesses	<i>Not answered.</i>
Testimony time (in minutes)	<i>Not answered.</i>