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

APPLICATION OF GOODNIGHT MIDSTREAM PERMIAN, LLC FOR APPROVAL OF A SALTWATER DISPOSAL WELL, LEA COUNTY, NEW MEXICO **CASE NO. 24123**

APPLICATIONS OF GOODNIGHT MIDSTREAM PERMIAN, LLC FOR APPROVAL OF SALTWATER DISPOSAL WELLS LEA COUNTY, NEW MEXICO **CASE NOS. 23614-23617**

APPLICATION OF GOODNIGHT MIDSTREAM PERMIAN LLC TO AMEND ORDER NO. R-22026/SWD-2403 TO INCREASE THE APPROVED INJECTION RATE IN ITS ANDRE DAWSON SWD #1, LEA COUNTY, NEW MEXICO. **CASE NO. 23775**

APPLICATIONS OF EMPIRE NEW MEXICO LLC TO REVOKE INJECTION AUTHORITY, LEA COUNTY, NEW MEXICO **CASE NOS. 24018-24020, 24025**

EMPIRE NEW MEXICO LLC'S PRE-HEARING STATEMENT

In accordance with Commission Rule 19.15.4.13(B) NMAC and paragraph 5 of the Third Amended Pre-Hearing Order issued January 31, 2025, Empire New Mexico LLC ("Empire") submits this pre-hearing statement.

INTRODUCTION

In Case Nos. **24123**, **23614-23617**, and **23775**, Goodnight Midstream Permian LLC's ("Goodnight") requests approval for an additional five saltwater disposal ("SWD") wells within the boundaries of the Eunice Monument South Unit ("EMSU"), which is operated by Empire, and an increase in the maximum allowable injection for the existing Andre Dawson #1 well located

within the EMSU. Goodnight's requests for four additional SWD wells within the EMSU will add an average of 135,000 barrels of water per day ("BWPD") and maximum of 208,000 BWPD, which would be an annual increase averaging 49,275,000 barrels or a maximum 75,920,000 barrels per year. The Andre Dawson #1 requested increase would add an additional 13,000 BWPD to its current allowable, or 4,745,000 additional barrels per year. *See* Self-Affirmed Statement of William West at 2, ¶ 3, filed as Empire Exhibit I on Aug. 26, 2024, and Exhibit I-2, attached thereto. Empire opposes Goodnight's applications.

In Case Nos. **24018**, **24019**, **24020**, and **24025**, Empire seeks to revoke Goodnight's injection authority for four existing saltwater disposal wells within the EMSU, including the Andre Dawson SWD #1, the Ernie Banks SWD #1, the Ryno SWD #001 f/k/a Snyder SWD Well No. 1, and the Sosa SA 17 SWD Well No. 2. *See* Empire's applications, attached as Exhibit 1; *see also* Self-Affirmed Statement of Sharon T. Shaheen (regarding notice), attached as Exhibit 2. As explained below, Goodnight's injection of incompatible water continues to cause harm to the correlative rights of the State of New Mexico, the United States, and Empire, among others, by impairing Empire's current waterflood operations and by causing waste in the residual oil zones in both the Grayburg and San Andres formations. Additional increases in allowable injection will exacerbate the harm Goodnight has already caused.

For all the reasons stated herein and detailed in Empire's written testimonies, Goodnight's applications in Case Nos. 24123, 23614-23617, and 23775 should be denied, and Empire's applications in Case Nos. 24018, 24019, 24020, and 24025 should be granted.

BACKGROUND

All of these cases relate to Goodnight's continuing injection of foreign and incompatible produced saltwater into the San Andres formation underlying the EMSU. The San Andres

formation is included within the unitized interval for the EMSU. Goodnight's continuing injection causes waste, impairs the correlative rights of each mineral interest owner in the Unit, including the majority owners of the minerals the State of New Mexico (58.32%) and the United States (19.27%), thereby interfering with Empire's operations of the Unit.

The subject field was discovered in 1929. Within 10 years, the field produced one MMBBls of oil. In 1979, the operator at that time began studying the area for possible secondary recovery by waterflood. Empire Ex. A at pdf 10, ¶ 11. In 1984, when the field was unitized, the vertical limits of the unitized interval were defined as "an upper limit described as 100 feet below mean sea level or at the top of the Grayburg, whichever is higher, to a lower limit at the base of the San Andres formation; the geologic markers having been previously found to occur at 3,666 feet and 5,283 feet, respectively, in Continental Oil Company's Meyer B-4 Well No. 23." Ex. A-6 at 2-3, ¶ 8 (pdf 131-32), ¶ 8. At that time, it was estimated that an additional 64.2 MMBBls of oil could be recovered by waterflooding the reservoir. Since that time, EMSU has produced approximately 25 MMBBls of oil. Empire Ex. A at pdf 10, ¶ 11. *See generally* Empire Exs. A-4, A-6 to A-8. The Unit was first operated by Gulf Oil Corporation, subsequently rebranded as Chevron U.S.A. Inc. In 2004, XTO acquired Chevron's interests, operating the Unit from 2004 to 2021. Empire acquired XTO's interests and became the successor operator in March of 2021. Empire Ex. A at pdf 13, ¶ 14. Empire acquired the EMSU from XTO because of the significant potential for enhanced oil recovery in the San Andres ROZ and the Grayburg. Empire Ex. I at 2, ¶ 3.

Goodnight first began injecting water into the San Andres unitized interval of the EMSU in July 2020 and, as of January 1, 2025 has injected approximately 63 million barrels of water therein. OCD Permitting General Information by Well. Goodnight also operates an additional

five SWD wells within approximately one mile of the EMSU, *see* Exhibit C to Goodnight Scope Motion (Sosa SA 17 SWD #002, Ted 28 SWD #001, Yaz 28 SWD #001, Pedro SWD #001, and Nolan Ryan SWD #001); and another SWD well in the San Andres within 2-1/2 miles of EMSU (Scully State SWD #1). Further, Goodnight has permitted an additional two wells within approximately 1.25 miles of the EMSU, which have not been drilled. *Id.* (Rocket SWD #1 and Verlander SWD). As of January 2025 the total amount of incompatible saltwater injected by Goodnight near Empire's operations is at least 126,594,411 million barrels of water. OCD Permitting General Information by Well.[1]

Empire will show at the hearing that Goodnight's injection to date and proposed injection into the future adversely impacts Empire's ability to recover hydrocarbons in the unitized interval, including both the Grayburg and the San Andres by, among other things, pressuring up the San Andres reservoir to levels above original reservoir pressure, requiring Empire to operate its carbon dioxide ("CO_2") tertiary recovery at a higher pressure than necessary, and requiring Empire to inject the produced water into another zone to make room for the CO_2 to avoid fracturing the formation. Further, re-pressurization of the San Andres increases water influx into the Grayburg formation through natural fractures, which is prematurely watering out Grayburg producers.

Although the upcoming evidentiary hearing is limited to the applications relating to wells within the boundaries of the EMSU, it is important to note the following: (1) Empire's interests, as well as those of other working interest owners, exist throughout the surrounding area and (2) no barrier or other geological feature divides the Grayburg or San Andres formations underlying the EMSU from the same formations in the surrounding area. Thus, Goodnight's disposal into the

[1] Empire Exhibit I-2 is a map of the area within which the EMSU is located, which illustrates the Unit boundaries. The Goodnight wells at issue, four drilled and five proposed to be drilled, are identified therein.

San Andres creates waste and impacts the correlative rights of interest owners throughout the area where the EMSU is located.[2]

COMMON ISSUES

The issues identified by the Commission for the upcoming hearing are common to all of the applications:

> At said hearing, the parties shall submit all evidence, testimony, and legal argument on the issue of the existence, extent of and possible interference with a residual oil zone [underlying] the Eunice Monument South Unit ("EMSU") by produced water injection activities undertaken by Goodnight.

Joint Order on Goodnight's Motion to Limit Scope of Hearing on Cases Within the EMSU and the Oil Conservation Division Motion Concerning the Scope of the Evidentiary Hearing Set for September 23-27, 2024, ¶ 2.

The Commission further limited the hearing to applications and wells within the EMSU, which includes only those cases identified in the caption above. Notably, the Commission expressly excluded Goodnight's applications in Commission Case Nos. 24277 and 24278, seeking contraction of the unit interval and related pool, from the instant proceeding. *Id.* ¶ 4 ("The following cases, previously part of this case, have been stayed by other Order of the Commission pending resolution of the cases above: . . . b. Commission Case Nos – 24277 and 24278.").

I. A RESIDUAL OIL ZONE EXISTS WITHIN THE SAN ANDRES FORMATION WITH AN ESTIMATED 900 MMBBLS OF OIL IN PLACE IN THE EUNICE MONUMENT FIELD.

Goodnight does not dispute the existence of recoverable hydrocarbons in a residual oil zone ("ROZ") within the Grayburg formation. Expert Report of William J. Knights, P.G. at 8, filed as

[2] Empire operates two other units near the EMSU, including a sub-unit of the EMSU, designated EMSU-B, which is adjacent to the northeast boundary of the EMSU, and the Arrowhead Grayburg Unit, the northern boundary of which is a little more than a mile from the EMSU. *See* Empire Ex. A-2.

Goodnight Exhibit E on Aug. 26, 2024. The flaw in Goodnight's analysis is that it has selected a top of the San Andres formation that is deeper than the actual top, thus excluding 150 to 200 feet of ROZ. Empire will show, through log analyses and structural interpretation, that oil saturations demonstrate the existence and extent of ROZs throughout the unitized interval, including within the San Andres formation.

Oil in a ROZ is called "residual" because it is not recoverable by primary production or secondary waterflood production. Self-Affirmed Statement of Dr. Robert S. Trentham at 3, filed as Empire Exhibit D on Aug. 26, 2024; *id.* at 6 ("The nature of an ROZ is that it will not yield oil in commercial quantities in either primary or secondary operations."). The characteristics of a ROZ include "good odor, cut, fluorescence, and gas shows in samples, calculations of 20% or much higher oil saturations from logs, 15-40% oil saturation from core analyses; predominance of dolomite over limestone; and production of sulfur water on DST's or completions." *Id.* at 6. *See generally id.* at 4-11 (explaining the history and science of ROZs). Oil in a ROZ is recoverable with the aid of an injectant that liberates the oil, such as CO_2. *Id.* This type of oil recovery is known as enhanced oil recovery or EOR. *Id.*

More than 12 CO_2 EOR projects are currently underway in ROZs in the Permian Basin. *Id.* at 4 and Exhibit D-1 attached thereto. The success of these projects shows that commercial oil can be produced from ROZs in the intervals below the main pay zones, such as the San Andres formation in the EMSU. *Id.* at 6. *See generally id.* at 12-

The existence of a ROZ within the San Andres formation underlying the EMSU and the surrounding area is confirmed by core on the EMSU-679 and RR Bell #4 wells within the EMSU and the North Monument Grayburg-San Andres Unit #522 well, operated by Amerada Hess, which is located near the EMSU-B. *See, e.g.*, Empire Exhibits B-7 to B-9, B-22, B-23, B-25, B-26, B-

32 to B-34; *see also* Self-Affirmed Statement of Laurence S. Melzer at 9, ¶ 18, filed as Empire Exhibit C on Aug. 26, 2024 ("The evidence from the cores taken at depth in the San Andres *clearly demonstrates a residual oil zone of at least 250' beneath the two EMSU units*." (emphasis added)) (filed as Empire Exhibit C on Aug. 26, 2024). Goodnight does not disagree. Goodnight Ex. E at 8 (conceding that a ROZ with a reasonable amount of oil in place exists between -350 and -500 ft subsea).

In fact, the oil/water contact in the San Andres ROZ is approximately -719' to -750' subsea and, potentially, deeper. *See* Empire Exhibit B at 7; *see also* Empire Exhibit B-6, Tables B-1 to B-10, and Plates B-1 and B-2. Core from the NMSAU #522 well, located approximately 6.5 miles north of the EMSU, reflects oil saturations down to 4399' depth (-700' subsea). Empire Exhibit I-24.

The existence of a ROZ in the San Andres is further confirmed by openhole logs and mud logs. Empire Ex. D at 23-24. For example, the EMSU-660 drilling mudlog shows good to yellow fluorescence, with regions of good cut and strong gas shows, across 150' of the San Andres. Empire Ex. G at 4, ¶ 11 & Exhibit G-4, attached thereto; *see* Empire Ex. C-3 (describing specific evidence from mud logging that indicates the presence of a ROZ, such as dull gold fluorescence, odor in samples, vertically decaying gas show, and free sulfur crystals); *see also* Empire Ex. D at 11 and Exhibits D-6 & D-7, attached thereto (discussing the well and mudlogs for the Anschutz #1 Keating well in the Tall Cotton field).

Moreover, core analysis from the Empire 679 well and the RR Bell # 4 indicates sufficient oil saturation to reach a conclusion that the San Andres has a ROZ irrespective of whether the San Andres was termed as "non-productive" in 1984. *See* Empire Ex. B at 3 and Exhibits B-7 and B-

8, attached thereto. Similarly, Empire's witness from NuTech, Galen Dillewyn, opines that there is oil saturation in the San Andres:

> The two formations analyzed at Eunice Monument were the Grayburg and the San Andres. An example of the work is in **Exhibit F-6**. For EMSU-673. The Resistivity of the Water (RW) used was 0.4 ohm @ 75 degF. This was balanced in the reservoir above the Grayburg and in the evaporite sequence above that. The San Andres and Grayburg are primarily a dolomitic rock with some interspersed limestones. Both formations show evidence of hydrocarbon saturation.

Revised Self-Affirmed Statement of Galen Dillewyn at 4-5, Track 18, filed as Revised Exhibit F on Dec. 4, 2024. NuTech's objective analysis was based on wireline logs for ten wells. Seven of the ten wells covered substantial portions of the San Andres interval that evidenced oil saturation ranging from 65% to 1%. *Id.* at 5. Empire witness Joseph A. McShane detailed the log results of these seven wells:

Well	Logged San Andres Interval	Net Oil Interval	Estimated MMBO Oil in Place/640 acres
EMSU-658	371'	182'	30.29
EMSU-673	362'	153'	31.68
EMSU-713	125'	40'	8.02*
EMSU-660	431'	313'	48.62
EMSU-746	1223'	508'	62.18
Ryno SWD #1	1215'	220'	15.62
EMSU-628	590'	266'	40.79

*Low due to limited section of San Andres drilled and logged

Empire Ex. G at 3-4, ¶ 10; Exhibits G-3(a)-(j), attached thereto. Likewise, geochemical evidence demonstrates that a ROZ exists within the EMSU. *Id.* at 4, ¶ 12 and Exhibit G-5, attached thereto; *see* Empire Ex. I at 9, ¶ ¶ 28-29 and Exhibits I-24 & I-25, attached thereto (showing the location of five cored wells showing the presence of oil in the San Andres).

Indeed, Goodnight Exhibit B-32 (slides 2 & 3) prepared by Goodnight witness Preston McGuire illustrates that core from the EMSU-679 well shows oil going as deep as -762' subsea and oil saturations are above 20% down to -652' subsea. Using the proper San Andres top of -

548' subsea, as picked by Dr. Robert Lindsay using the core, Goodnight Exhibit B-32 would indicate that there is 104' of ROZ in the San Andres with greater than 20% oil saturation.

Notably, when Empire first explored the possibility of acquiring the EMSU and other assets from the predecessor operator, XTO/Exxon Mobil ("XTO") represented that the EMSU, EMSU B and AGU hold a combined 23,400 acres of ROZ potential and that the ROZ interval is approximately 350' thick with an average oil saturation of ~25%. *See* EMSU, EMSU-B and AGU Upside Potential – Infill Drilling and ROZ at 2-3 (Empire Exhibit A-5). XTO further represented that approximately 912 million barrels of oil were in a ROZ that extended from -400' to -700' within the San Andres formation that extends throughout the three units. *Id.* at 3; *see id.* at 6-7. XTO's estimates are consistent with recent experience in existing enhanced oil recovery project targeting a ROZ, such as the Seminole San Andres Unit ("SSAU"), just across the Texas state line from the Eunice Monument area. Empire Exhibit C at 3 (estimating recovery of oil from CO_2 flooding the ROZ in the SSAU to be 68 MMBbls and in the Denver Unit within the Wasson field complex north of the Seminole field to be 50MMBbls); *see* Empire Exs. C-5 to C-8. The Tall Cotton project may be more analogous here, as it targeted a ROZ without a main pay zone, like the ROZ in the San Andres formation in the EMSU and surrounding area. The Tall Cotton project, initiated in 2014, peaked at 3000 BOPD and accumulated over 5MBbls to date, in an area less than a square mile. *Id.* at 4; *see* Empire Exs. C-4, C-9, & C-10.

Goodnight concedes that two wells have tested oil in the San Andres, EMSU-658 and EMSU-660. Goodnight Ex. E at 4-5. This evidences the existence of moveable oil, which Goodnight's saltwater disposal operations are pushing off the lease and unit. Goodnight's contention that the ROZ exists only in the Grayburg formation rests on the misidentification of the top of the San Andres formation. Empire Rebuttal Exhibits J, K, and N-4. Goodnight admits that

it picked the top lower at the Oil Conservation Division's recommendation to increase separation for water disposal. Empire Rebuttal Exhibit N-2.

Empire witness William West estimates that 37 million barrels of oil can be recovered using a 72 pattern 5-spot configuration and 141 million barrels using a 250 pattern field development. Empire Exhibits I-27 and I-29. By raising the reservoir pressure to 3000 psi, Empire will be required to purchase 25% more CO2 than if the CO2 flood is operated at 1500 psi. Empire Exhibit I-30. Goodnight admits it is increasing reservoir pressure by 4 to 7 psi for every one million barrels of water injected, therefore reservoir pressure will increase by 292 to 511 psi per year by the disposal of 200,000 BWPD. Goodnight is negatively impacting the economics of the CO2 flood by their disposal of large volumes of incompatible water. Empire Ex. I at 15(H).

II. GOODNIGHT'S INJECTION INTERFERES WITH EMPIRE'S ABILITY TO RECOVER OIL FROM THE ROZS IN THE GRAYBURG AND SAN ANDRES FORMATIONS.

Historic pressures, water testing, and high volumes of water production prior to the waterflood confirm that communication between the formations occurs through natural fractures.

The San Andres reservoir pressure dropped from 1747 psi at -430' subsea to 1245 psi (28.7% depletion) by April 1986, with limited production from the San Andres, as measured in the EMSU-211 well. This pressure decline was also confirmed by the openhole RFT run in EMSU-458 which showed a 28.5% drop. Fluid levels in EMSU-457 and EMSU-460 San Andres water supply wells also showed a similar pressure drop. Empire Ex. I at 5; Exhibits I-3 and I-4, attached thereto; *see also id.* at 10, Section B (discussing communication between the San Andres formation and the Grayburg formation). In addition, Chevron documented sulfate water from the San Andres entering the Grayburg formation and causing barium sulfate scale prior to the waterflood. *Id.* at 6 and Exhibit I-7. Notably, wells in the crestal area of the reservoir experienced high water

production prior to the waterflood and this high water production is attributed to San Andres water entering the Grayburg through natural fractures. Empire Ex. I at 5-6; Exhibits I-5 & I-6, attached thereto.

Downdip water disposal moves up structure into the -350' to -500' ROZ interval defined by Goodnight and into the -500' to -763' subsea ROZ interval defined by core. Rebuttal Exhibit N-6. Empire has identified the top of the San Andres formation at approximately -350' subsea at the crest and this indicates there is 150' to 400' of ROZ in that area of the field. Empire Exhibit N-5.

In short, natural fractures exist in both the Grayburg and San Andres formations and promote communication between the two intervals. *See* Self-Affirmed Statement of Dr. Robert F. Lindsay at 2, 5-6, 11 (filed as Empire Exhibit B on Aug. 26, 2024); Empire Exhibits J-4 through J-12 and Appendix 1, attached thereto. Empire's witness Dr. Robert Lindsay, who worked on the Eunice Monument complex of unitized oil fields for Chevron from 1988 to 2002, has conducted fracture studies that reveal the prevalence of fractures measured in the lower Grayburg reservoir and in the upper San Andres residual oil zone. *See, e.g.*, Empire Exhibits B-12 to B-20; *see also* Empire Exhibits J-3 to J-9. As explained by Dr. Lindsay, water chemistry studies verified that plumes of water came from the San Andres formation, which contains low salinity water that is sulfate rich. Empire Exhibit B at 4, ¶ 7. The presence of San Andres sulfate water mixing with the Grayburg barium ions and forming barium sulfate scale prior to the waterflood shows that San Andres water entered the Grayburg prior to the waterflood. *See id.* at 4-5, ¶ 8; *id.* at 6; Empire Exhibit B-21.

As explained by Empire's reservoir modeling expert, Dr. James L. Buchwalter, the San Andres is in hydraulic communication with the Grayburg through natural fractures, which are most

prevalent at the crestal portions of the field. In Dr. Buchwalter's model, cumulative water production volumes as of 1/1/1986, prior to the waterflood, were used to determine the vertical permeability necessary to match historical well performance and reservoir pressure. Self-Affirmed Statement of Dr. James L. Buchwalter at 3, ¶ K(1), filed as Empire Exhibit E on Aug. 26, 2024. Running the model with no vertical communication between the two intervals resulted in cumulative water production at only about half of the actual historic production and over 100 wells produced excessively low water production in the model, compared to actual. *Id.* at 3-4. A match with historic water production was only possible by increasing the communication between the two formations in the model. *Id.* at 4, ¶ 2.

Further, re-pressurization resulting from Goodnight's continued injection will result in high water influx into the Grayburg, even if pressures are dissipated to other parts of the reservoir. *Id.* at 5, ¶ 5; *id.* at 6, ¶ 2; *see* Empire Ex. I at 2 ("[D]isposal water is pressuring up the reservoir to levels above original reservoir pressure (1527 psi@4000 feet) and based upon maximum allowed surface injection pressures, will likely reach 3000 psi before disposal rates decline significantly."). The resulting uptick in pressure will require Empire to operate the CO_2 EOR project at a higher pressure than necessary (MMP<2000 psi) and to inject produced water into another zone to allow space for the CO_2 to avoid fracturing the formation. *Id.* at 7, ¶ 14; *cf. id.* at 7-8, ¶¶ 15-21 (describing the total area impacted by Goodnight's operations, which far exceeds the 5-acre surface leases apparently assigned to each of Goodnight's SWDs); Exhibits I-15 to I-17, I-19 to I-20. Allowing Goodnight to continue to dispose of water, thereby increasing the pressure, will increase the amount of CO_2 required, adding significant additional costs. *Id.* at 10, ¶ 34 & Exhibit I-30.

Indeed, within 10 years, the five new proposed wells alone will have impacted 1540 acres each, totaling 13,930 acres, which equates to 98% of EMSU assigned acreage. Empire Ex. I at 9,

¶ 25 and Exhibit I-21; *see id.* ¶ 26 and Exhibit I-21 (stating that within 20 years, the five new proposed wells will have collectively impacted 27,950 acres, which is close to twice the size of EMSU). At a disposal rate of 40,000 barrels of water per day, Goodnight will exceed the storage volume of the five-acre tract assigned to each proposed well within 13 days. *Id.* at 9, ¶ 27 and Exhibit I-23.

Notably, the model prepared by Empire witness Dr. Buchwalter confirmed the conclusion reached by Chevron, a predecessor operator of the EMSU, that prior to unitization and the waterflood, San Andres water was migrating into Grayburg and Penrose wells, resulting in barium sulfate scale, barite, and a deposition problem. Empire Ex. E at 6, ¶ (1). Moreover, Goodnight's disposal of off-lease high salinity water, containing chemicals from Delaware Basin fracture treatments, causes increased corrosion and scaling as it is processed and reinjected into Grayburg wellbores. *See* Empire Ex. I at 3; *id.* at 6, ¶¶ 11-12 and Exhibits I-8 to -9. The model also demonstrated that influx of injected water from the San Andres to the Grayburg is adversely impacting the waterflood recovery due to non-uniform sweep. Empire Ex. E, ¶ 3.

Moreover, core analyses reveal larger vertical permeabilities in both the Grayburg and San Andres, which will be an advantage in CO_2 recovery. Ex. C at 5, ¶ 10.; *id.* at 6, ¶ 11. This vertical permeability is adversely impacted, however, by Goodnight's injection. As explained by Dr. Trentham, Goodnight's continuing injection of produced water adversely impacts the recovery of oil from the ROZ in both formations, regardless of the methodology used for the EOR. Empire Ex. D at 22-23. Dr. Trentham concludes as follows:

> *Core and log information confirms the presence of a ROZ at EMSU, EMSU-B, and AGU. Goodnight's continued injection of off lease produced water into the San Andres reservoir within and near EMSU will greatly diminish or destroy Empire's ability to employ any potential EOR methodology in their properties. Disposal of off lease saltwater by a 3rd party Company should be terminated inside the*

> *waterflood units where a Main Pay Zone or ROZ interval exist[s] so that EOR process can be properly implemented.*

Id. at 23-24.

In addition, Empire has seen an increase in chlorides in four wells near the Goodnight SWD wells, indicating that San Andres water is entering the Grayburg formation. Empire Ex. I at 6, ¶ 12; Exhibits I-9 to I-12 attached thereto; Empire Exhibit N-9.

All of this evidence demonstrates, contrary to Goodnight's assertions, there is no "seal" or "geologic barrier" between the Grayburg and the San Andres formations that prevents communication between the two formations. As explained by Empire's witnesses, reservoir quality rock exists just below the Grayburg, with greater than 10% porosity and varying thicknesses of tight anhydrite layers at the top of the San Andres. Empire Ex. G at 5, ¶ 14. As discussed above, this reservoir rock is commonly capped by collapse breccias near the crest of the structure, with fractures that act as fluid conduits. *Id.; see id.* Exhibits G-7(a)-(b), attached thereto.

As explained by Empire's witness Dr. Lindsay, the injection of produced water foreign to the San Andres can reduce reservoir quality and damage ROZ productivity. *See* Empire Exhibit B at 4-5. Notably, water analysis of Goodnight's Wrigley saltwater disposal well ("SWD") raises concerns about scale precipitation due to high levels of sodium and calcium. *Id.* at 5, 9. Goodnight's disposal water contains much higher levels of sodium and calcium than produced waters from Empire's operations. Goodnight's levels of sodium range from 39,580-51,322 mg/L, while Empire's averages 6426 mg/L. Similarly, Goodnight's disposal water contains 2206-5988 mg/L of calcium, while Empire's averages 652 mg/L. *Id.* at 12. In short, produced water containing ions such as Ca, Na, K, and Ba will mix with SO4 to precipitate cement (scale) within the ROZ, reducing reservoir quality and damaging future ROZ productivity. *Id.* at 5.

Moreover, by definition, injection of waste water by Goodnight creates over-pressured formations. Empire Ex. C. at 6, ¶ 12. This over-pressurization exacerbates existing, and causes additional, fractures and collapse breccia. *See* Empire Ex. G at 5, ¶ 14.

The error in Goodnight's argument is two-fold: (1) Goodnight misrepresents the top of the San Andres, and (2) Goodnight misinterprets the oil saturation evidenced in the well logs. Notably, the error is compounded by Goodnight's witnesses who rely on the testimony of Goodnight's witness Preston McGuire, without confirming Mr. McGuire's representations.

Goodnight contends that a 200-foot barrier extends across the EMSU, separating the zone in which Goodnight injects incompatible water from the ROZs that exist in the Grayburg and San Andres formations. *See, e.g.*, Self-Affirmed Statement of Preston McGuire at 27, ¶¶ 73-74, filed as Goodnight Exhibit B on Aug. 26, 2024. Goodnight's witness Mr. McGuire states that "[a]dditional engineering evidence, addressed below and through Goodnight's technical experts, confirms this assessment." *Id.* ¶ 74. The problem with this representation is that the cross-sections provided by Mr. McGuire do not show a continuous 200-foor barrier, and each of Goodnight's witnesses relied on Mr. McGuire's representations that a 200-foot barrier divides Goodnight's disposal zone from existing ROZs. *See, e.g.*, Thomas Tomastik Depo. Tr. at 41:4-11, excerpts attached hereto as Exhibit 3; John McBeath Depo. Tr. at 32:20-23, excerpts attached hereto as Exhibit 4; Larry Lake Depo. Tr. at 26:22-27:1, excerpts attached hereto as Exhibit 5; Davidson Depo. Tr. at 35:17-24, excerpts attached hereto as Exhibit 6. Mr. McGuire's claim that the formation top should be picked based on engineering data, rather than geological data, ignores the voluminous geological data that is available and supports Empire's position. As will be demonstrated at hearing, Mr. McGuire is simply wrong about the tops of the San Andres and the existence of a 200-foot barrier between Goodnight's disposal and Empire's operations.

For example, log analysis of Goodnight's Ryno SWD #1 well reflects the following:

-728 feet SSD>top injection perf in the Ryno SWD #1 well

-761 feet SSD > deepest core point on EMSU-669, 16.2% oil

-2013 feet SSD > deepest injection perf in the Ryno SWD #1 well

-2142 feet SSD > Ryno SWD #1 deepest penetration, 40% oil

Self-Affirmed Statement of Frank J. Marek at 2, filed as Empire Exhibit H on Aug. 26, 2024. Thus, the Ryno SWD #1 well is clearly injecting into an existing ROZ within the San Andres formation. *Id.* This conclusion is supported by core data from the EMSU-679, which shows an oil saturation of 16.2% at -761 feet subsea depth. *Id.*; *see* Empire Exhibit C at 4, ¶ 8 (explaining the corrected values to conventional core necessary to represent true in-situ values).

III. INJECTION OF HIGH SALINITY PRODUCED WATER WILL LIKELY CONTAMINATE THE GOAT SEEP AQUIFER.

The Goat Seep aquifer is one of only two sources of deep low salinity water in the Chihuahuan desert. Empire Ex. B at 9. Reservoirs along the Eunice Monument units are immediately up-dip approximately 1.5 to 2 miles from the Goat Seep aquifer. *Id.* The Goat Seep aquifer is in pressure and fluid communication with both the EMSU and the Arrowhead Grayburg Unit. *Id.* High salinity produced water injected into the San Andres is being sucked up by the lower pressure Grayburg interval, causing vertical plumes of water that will ultimately migrate down-dip to contaminate the Goat Seep aquifer due to the higher density of the injected water. *Id.*; *see* Exhibits B-28 to B-30.

CONCLUSION

For all the reasons stated herein, which will be established at hearing by Empire, the applications in **Case Nos. 24123, 23614-23617,** and **23775** should be **denied**, and the applications in **Case Nos. 24018**, **24019**, **24020**, and **24025** should be **approved.**

PROPOSED EVIDENCE BY EMPIRE

Empire anticipates that witnesses will be presented as provided in the Commission's Order on Prehearing Matters filed on or about January 21, 2025, in the following order: (1) Empire, (2) Goodnight, and (3) the Division. *Id.* ¶ 7. As discussed at the Commission's meeting on February 3, 2025, Empire's witnesses are planning to present a summary of their proposed testimony for approximately 15 minutes, to be followed by cross-examination by the parties and the Commission. The time necessary for each witness to testify will be determined by the extent of cross-examination by the parties and the Commission. Additional rebuttal evidence may be allowed as deemed appropriate by the Commission. *Id.*

At this time, Empire plans to have its witnesses available February 24-28 and to present them in the following order:

EMPIRE WITNESSES		**Written Testimonies**[3]
1.	Empire VP – Land and Legal Jack E. Wheeler	Ex. A
2.	Consulting Geologist Dr. Robert F. Lindsay	Exs. B & J
3.	Consulting Chemical Engineer Galen Dillewyn	Rev. Ex. F
4.	Empire Petroleum Geologist Joseph A. McShane	Ex. G

[3] Prior to hearing, Empire will provide identical notebooks with all of Empire's exhibits to the Commissioners, Commission counsel, and each party.

5.	Consulting Geologist Ryan Bailey (in rebuttal)	Ex. K
6.	Consulting Petrophysicist Stanley (Scott) Birkhead (in rebuttal)	Ex. L
7.	Consulting Geologist in reservoir characterization and ROZs, Dr. Robert C. Trentham	Ex. D
8.	Consulting Geological Engineer Laurence S. Melzer	Ex. H
9.	Consulting Engineer Frank J. Marek	Ex. H
10.	Consulting Reservoir Engineer Dr. James Buchwalter	Exs. E & M
11.	Empire Senior VP of Operations William West	Exs. I & N

The qualifications and full narrative of the direct testimony and exhibits for all witnesses, with the exception of Mr. Bailey and Mr. Birkhead, were previously filed on August 26, 2024 (Empire Exs. A-I). Revised testimonies of Mr. Dillewyn and Mr. McShane were filed on or about December 4 and December 5, 2024, respectively (Revised Exhibit F and Revised Exhibit G). Rebuttal testimony and exhibits will be filed concurrently with this Pre-Hearing Statement (Empire Exhibits J-N). Empire provides a summary of each witness's qualifications and testimony below.

1. **Jack E. Wheeler** (Senior 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. Mr. Wheeler will present his direct testimony in person.

2. **Dr. Robert "Bob" F. Lindsay** (Consulting Geologist, Lindsay Consulting) will testify to his characterization of the geology of the San Andres/Grayburg reservoir, including (1) selection of the top of San Andres, (2) the presence of a residual oil zone (ROZ) within the San Andres, (3) identifiable vertical fractures within the San Andres and Grayburg which allows for vertical migration of injected saltwater from the San Andres into the Grayburg, and (4) the lack of an effective geologic seal between the Grayburg and the San Andres. Dr. Lindsay will present his direct and rebuttal testimony in person.

3. **Galen Dillewyn** (Consulting Log Analyst, Vice President, Business Development – NuTech Energy Alliance) will testify on the procedures NuTech used to determine oil saturations of the Grayburg waterflooded interval and San Andres ROZ in 7 key wells at EMSU, including (1) the NULOOK process for determining rock properties and oil saturation in carbonate reservoirs, (2) sensitivities run where the "m" and "n" were varied,

and (3) determination that a ROZ interval exists at EMSU. Mr. Dillewyn will present his direct testimony by video.

4. **Joseph A. McShane** (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 Oil-in-Place volumes, (5) proof of the ROZ in the San Andres and (6) the lack of geologic barrier between the Grayburg and San Andres. Mr. McShane will present his direct testimony in person.

5. **Ryan Bailey** (Consulting Geologist in Stratigraphic Modeling, VP of Ops Geologic, LLC) will testify in his rebuttal to Mr. Preston McGuire that (1) Goodnight's selection of a deeper top for the San Andres reduces Goodnight's estimate of oil-in-place for the San Andres ROZ, (2) Goodnight does not recognize the Lovington sand as a marker within the Upper San Andres and many of their picks for top of San Andres are at this sand and (3) there is considerable oil-in-place in both the Upper and Lower San Andres based on Ops Geologic log interpretation and mapping. Mr. Bailey will present his rebuttal testimony in person.

6. **Stanley "Scott" Birkhead** (Consulting Petrophysicist, Ops Geologic LLC.) will testify that (1) Goodnight's estimate of oil saturation is pessimistic due to the log parameters and rock facies utilized in the interpretation, (2) their oil-in-place is low due to the use of a San Andres structure top provided to expert witness Dr. Davidson by Goodnight, and (3) that there is high oil saturation intervals in both the Upper and Lower San Andres which Goodnight failed to identify due to their interpretation techniques applied to the data. Mr. Birkhead will present his rebuttal testimony in person.

7. **Dr. Robert "Bob" Trentham** (Consulting Geologist in reservoir characterization and ROZs, UT Permian Basin) will testify about (1) the ROZ fairways which developed in New Mexico and Texas, leaving large volumes of residual oil beneath main pay zones (brown field) and isolated with no main pay (green field), (2) CO2-EOR success at Seminole ROZ interval (brown field) which has produced 20,000 BOPD for over 10 years, (3) similarities and the success of CO2-EOR at Tall Cotton (green field) where no commercial oil production had been established prior to CO2 injection, and (4) core and log information confirms the presence of a ROZ at EMSU, EMSU-B, and AGU. Dr. Trentham will present his direct testimony by video.

8. **Laurence "Steve" Melzer** (Consulting Geological Engineer, Melzer CO2 Consulting) will testify about (1) the use of enhanced oil recovery techniques including CO_2 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 CO_2 storage, thus creating waste. Mr. Melzer will present his direct testimony in person.

9. **Frank "Deacon" 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. Mr. Marek will present his direct testimony by video.

10. **Dr. James "Jim" Buchwalter** (Consulting Reservoir Engineer, President of Gemini Solutions Inc.) will testify about (1) reservoir model constructed for EMSU, EMSU-B, and AGU waterflood units and San Andres ROZ interval, (2) to obtain pressure and production history match required that water influx from San Andres occur with the start of production in the 1930's, and (3) Goodnight is pressuring up the San Andres at a rate of at least 4 psi for every million barrels of water injected and this will result in 50,000 BWPD entering the Grayburg within the next two years due to higher San Andres pressure. Dr. Buchwalter will present his direct and rebuttal testimony in person.

11. **William West** (Senior Vice-President of Operations) is employed by Empire and 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) evidence that there is a ROZ in the San Andres, (4) the estimated area of exposure of SWD saltwater within the EMSU, (4) SWD impacts on secondary and tertiary recovery projects going forward, and (5) how Goodnight's downdip disposal will impact the updip portions of the San Andres and ultimately enter the Grayburg. Mr. West will present his direct and rebuttal testimony in person.

PROCEDURAL MATTERS

This matter is set for an evidentiary hearing to begin February 24, 2024, with opening arguments, and arguments on pending motions to the extent deemed necessary by the Commission, on February 20, 2024. *See* Third Pre-Hearing Order (issued on or about Jan. 21, 2024). Pending motions include the following:

- Goodnight's Consolidated Motion for Partial Summary Judgment
- Goodnight's Motion to Strike Empire's Rebuttal Disclosure of Ryan and Scott
- Empire's Motion to Clarify Scope
- Motions to exclude all or a portion of an expert witness's testimony, which are due no later than February 13, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was served upon the following counsel of record by electronic mail on February 10, 2025.

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/s/ Sharon T. Shaheen
Sharon T. Shaheen

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

APPLICATION OF EMPIRE NEW MEXICO LLC TO REVOKE THE INJECTION AUTHORITY GRANTED UNDER ORDER NO. R-22026 FOR THE ANDRE DAWSON SWD #001 OPERATED BY GOODNIGHT MIDSTREAM PERMIAN LLC, LEA COUNTY, NEW MEXICO **CASE NO. 24018**

APPLICATION

Empire New Mexico LLC ("Empire") respectfully applies for an order revoking the injection authority granted under Order No. R-22026/SWD-2403 in Case No. 21569 ("Order"). In support, Empire states as follows:

1. Goodnight Midstream Permian, LLC ("Goodnight") is the operator of record for the Andre Dawson SWD #1 well, API# 30-025-50634 ("Well"), a produced water disposal well located 1105' FSL and 244' FEL (Unit P) of Section 17, Township 21 South, Range 36 East, in Lea County, NM.

2. The Well is disposing of water within the unitized interval of the Eunice Monument South Unit ("Unit"), which is operated by Empire.

3. The unitized interval of the Unit extends from the top of the Grayburg formation to the bottom of the San Andres formation ("Unitized Interval"). The vertical limits of the Unitized Interval are the same as the vertical limits of the Eunice Monument Grayburg-San Andres Pool covering the Grayburg and San Andres formations.

4. The Well disposes into the San Andres formation between 4,287 feet and 5,590 feet.

Exhibit 1

5. At the time of the application, Goodnight misrepresented that the San Andres is a non-productive zone known to be compatible with formation water from the Bone Spring, Delaware, and Wolfcamp formations ("Produced Water").

6. However, residual oil zones ("ROZ") are found within the San Andres, and Empire has the right to recover hydrocarbons therein.

7. Moreover, the salinity levels of Produced Water are substantially greater than the salinity levels of water in the Unitized Interval, including the San Andres formation.

8. Goodnight began disposing into the Well on approximately January 18, 2023 and has regularly exceeded the permitted maximum daily disposal rate of 25,000 barrels of water, in violation of the Order. Within the first 166 days of disposal, Goodnight exceeded the permitted daily disposal rate 60 days.

9. Disposal in the Well impairs the ability of Empire to recover hydrocarbons within the Unitized Interval and thereby adversely affects the correlative rights of Empire and other interest owners in the Unit and results in waste.

10. Empire has requested that Goodnight voluntarily cease disposal of produced water in the Well, but as of the date of filing this application, the Well remains an active saltwater disposal well. Rather, Goodnight filed an application to increase the maximum daily disposal rate to 40,000 barrels of water in Case No. 23775, which is currently pending before the Division.

11. Revocation of the disposal authority granted by Order No. R- 22026 will prevent the waste of recoverable hydrocarbons and will protect correlative rights.

WHEREFORE, Empire requests that this case be heard as a status conference on December 7, 2023 and, at that time, be set for a consolidated contested hearing with Case No. 23775.

Respectfully submitted,

MONTGOMERY & ANDREWS, P.A.

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Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Order No. R-22026 for the Andre Dawson SWD #001 Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Order No. R-22026, SWD-2403, issued in Case No. 21569 on February 7, 2022, to dispose of produced water in the Andre Dawson SWD #1 well, API# 30-025-50634 ("Well"), a produced water disposal well located 1105' FSL and 244' FEL (Unit P) of Section 17, Township 21 South, Range 36 East, in Lea County, NM. The approved injection zone is the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 6.5 miles Northwest of Eunice City, New Mexico.

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

APPLICATION OF EMPIRE NEW MEXICO LLC TO REVOKE THE INJECTION AUTHORITY GRANTED UNDER ORDER NO. R-22027 FOR THE ERNIE BANKS SWD NO. 1 WELL OPERATED BY GOODNIGHT MIDSTREAM PERMIAN LLC, LEA COUNTY, NEW MEXICO

CASE NO. 24019

APPLICATION

Empire New Mexico LLC ("Empire") respectfully applies for an order revoking the injection authority granted under Order No. R-22027 in Case No. 21570 ("Order"). In support, Empire states as follows:

1. Goodnight Midstream Permian, LLC ("Goodnight") is the operator of record for the Ernie Banks SWD No. 1 well, API# 30-025-50633 ("Well"), a produced water disposal well located 395 feet from the North line and 1203 feet from the West line (Unit D) of Section 17, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico.

2. The Well is disposing of water within the unitized interval of the Eunice Monument South Unit ("Unit"), which is operated by Empire.

3. The unitized interval of the Unit extends from the top of the Grayburg formation to the bottom of the San Andres formation ("Unitized Interval"). The vertical limits of the Unitized Interval are the same as the vertical limits of the Eunice Monument Grayburg-San Andres Pool covering the Grayburg and San Andres formations.

4. The Well disposes into the San Andres formation through a perforated interval from 4312 feet to 5615 feet below surface.

5. At the time of the application, Goodnight misrepresented that the San Andres is a non-productive zone known to be compatible with formation water from the Bone Spring, Delaware, and Wolfcamp formations ("Produced Water").

6. However, residual oil zones ("ROZ") are found within the San Andres, and Empire has the right to recover hydrocarbons therein.

7. Moreover, the salinity levels of Produced Water are substantially greater than the salinity levels of water in the Unitized Interval, including the San Andres formation.

8. Further, Goodnight is in violation of the Order for failure to report disposal volumes.

9. Disposal in the Well impairs the ability of Empire to recover hydrocarbons within the Unitized Interval and thereby adversely affects the correlative rights of Empire and other interest owners in the Unit and results in waste.

10. Empire has requested that Goodnight voluntarily cease disposal of produced water in the Well, but as of the date of filing this application, the Well remains an active salt water disposal well.

11. Revocation of the disposal authority granted by Order No. R-22027 will prevent the waste of recoverable hydrocarbons and will protect correlative rights.

WHEREFORE, Empire requests that this case be heard as a status conference on December 7, 2023 and, at that time, be set for a contested hearing on the same docket as Case No. 23775.

Respectfully submitted,

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Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Order No. R-22027 for the Ernie Banks SWD #001 Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Order No. R-22027, issued in Case No. 21570 on February 7, 2022, to dispose of produced water in the Ernie Banks SWD #1 well, API# 30-025-50633 ("Well"), a produced water disposal well located 395 feet from the North line and 1203 feet from the West line (Unit D) of Section 17, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico. The approved injection zone is the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 8.4 miles Northwest of Eunice City, New Mexico.

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

APPLICATION OF EMPIRE NEW MEXICO LLC TO REVOKE THE INJECTION AUTHORITY GRANTED BY ADMINISTRATIVE ORDER SWD-2307 FOR THE RYNO SWD #001 F/K/A SNYDER SWD WELL NO. 1 OPERATED BY GOODNIGHT MIDSTREAM PERMIAN LLC, LEA COUNTY, NEW MEXICO **CASE NO. 24020**

APPLICATION

Empire New Mexico LLC ("Empire") respectfully applies for an order revoking the injection authority granted under Administrative Order No. SWD-2307 ("Order"). In support, Empire states as follows:

1. Goodnight Midstream Permian, LLC ("Goodnight") is the operator of record for the Ryno SWD #001 f/k/a Snyder SWD Well No. 1, API# 30-025-43901 ("Well"), a produced water disposal well located 1450 feet from the North line and 708 feet from the East line (Unit H) of Section 17, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico.

2. The Well is disposing of water within the unitized interval of the Eunice Monument South Unit ("Unit"), which is operated by Empire.

3. The unitized interval of the Unit extends from the top of the Grayburg formation to the bottom of the San Andres formation ("Unitized Interval"). The vertical limits of the Unitized Interval are the same as the vertical limits of the Eunice Monument Grayburg-San Andres Pool covering the Grayburg and San Andres formations.

4. The Well disposes into the San Andres formation from 4320 feet to 5625 feet below surface.

5. At the time of the application, Goodnight misrepresented that the San Andres is a non-productive zone known to be compatible with formation water from the Bone Spring, Delaware, and Wolfcamp formations ("Produced Water").

6. However, residual oil zones ("ROZ") are found within the San Andres, and Empire has the right to recover hydrocarbons therein.

7. Moreover, the salinity levels of Produced Water are substantially greater than the salinity levels of water in the Unitized Interval, including the San Andres formation.

8. Disposal in the Well impairs the ability of Empire to recover hydrocarbons within the Unitized Interval and thereby adversely affects the correlative rights of Empire and other interest owners in the Unit and results in waste.

9. Empire has requested that Goodnight voluntarily cease disposal of produced water in the Well, but as of the date of filing this application, the Well remains an active salt water disposal well.

10. Revocation of the disposal authority granted under Administrative Order No. SWD-2307 will prevent the waste of recoverable hydrocarbons and will protect correlative rights.

WHEREFORE, Empire requests that this case be heard as a status conference on December 7, 2023 and, at that time, be set for a contested hearing on the same docket as Case No. 23775.

Respectfully submitted,

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Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Administrative Order No. SWD-2307 for the Ryno SWD #001 f/k/a Snyder SWD Well Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Administrative Order No. SWD-2307, issued on November 2, 2017, to dispose of produced water in the Ryno SWD #001 f/k/a Snyder SWD Well No. 1, API# 30-025-43901 ("Well"), a produced water disposal well located 1450 feet from the North line and 708 feet from the East line (Unit H) of Section 17, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico. The approved injection zone is the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 7.7 miles Northwest of Eunice City, New Mexico.

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

APPLICATION OF EMPIRE NEW MEXICO LLC TO REVOKE THE INJECTION AUTHORITY GRANTED UNDER ORDER NO. R-21190 FOR THE SOSA SA 17 NO. 2 WELL OPERATED BY GOODNIGHT MIDSTREAM PERMIAN LLC, LEA COUNTY, NEW MEXICO

CASE NO. 24025

APPLICATION

Empire New Mexico LLC ("Empire") respectfully applies for an order revoking the injection authority granted under Order No. R-21190 in Case No. 20721 ("Order"). In support, Empire states as follows:

1. Goodnight Midstream Permian, LLC ("Goodnight") is the operator of record for the Sosa SA 17 SWD Well No. 2 well, API# 30-025-47947 ("Well"), a produced water disposal well located 470 feet from the South line and 1815 feet from the West line (Unit N) of Section 17, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico.

2. The Well is disposing of water within the unitized interval of the Eunice Monument South Unit ("Unit"), which is operated by Empire.

3. The unitized interval of the Unit extends from the top of the Grayburg formation to the bottom of the San Andres formation ("Unitized Interval"). The vertical limits of the Unitized Interval are the same as the vertical limits of the Eunice Monument Grayburg-San Andres Pool covering the Grayburg and San Andres formations.

4. The Well disposes into the San Andres formation through a perforated interval from 4500 feet to 5350 feet below surface.

5. At the time of the application, Goodnight misrepresented that the San Andres is a non-productive zone known to be compatible with formation water from the Bone Spring, Delaware, and Wolfcamp formations ("Produced Water").

6. However, residual oil zones ("ROZ") are found within the San Andres, and Empire has the right to recover hydrocarbons therein.

7. Moreover, the salinity levels of Produced Water are substantially greater than the salinity levels of water in the Unitized Interval, including the San Andres formation.

8. Further, Goodnight is in violation of the Order by regularly exceeding its maximum daily injection rate of 25,000 BWPD, with 4 months of disposal averaging more than 25,000 BWPD based on their monthly reported volumes. Most recent violations of the maximum daily rates occurred in July and August 2023.

9. Disposal in the Well impairs the ability of Empire to recover hydrocarbons within the Unitized Interval and thereby adversely affects the correlative rights of Empire and other interest owners in the Unit and results in waste.

10. Empire has requested that Goodnight voluntarily cease disposal of produced water in the Well, but as of the date of filing this application, the Well remains an active salt water disposal well.

11. Revocation of the disposal authority granted by Order No. R-21190 will prevent the waste of recoverable hydrocarbons and will protect correlative rights.

WHEREFORE, Empire requests that this case be heard as a status conference on December 7, 2023 and, at that time, be set for a contested hearing on the same docket as Case No. 23775.

Respectfully submitted,

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Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Order No. R-21190 for the Sosa SA 17 SWD Well No. 2 Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Order No. R-21190, issued in Case No. 20721 on March 2, 2020, to dispose of produced water in the Sosa SA 17 SWD Well No. 2, API# 30-025-47947 ("Well"), a produced water disposal well located 470 feet from the South line and 1815 feet from the West line (Unit N) of Section 17, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico. The approved injection zone is the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 7.3 miles Northwest of Eunice City, New Mexico.

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

APPLICATIONS OF EMPIRE NEW MEXICO LLC
TO REVOKE INJECTION AUTHORITY,
LEA COUNTY, NEW MEXICO **CASE NOS. 24018-24020, 24025**

AFFIRMATION OF NOTICE

I, Sharon T. Shaheen, attorney for EMPIRE NEW MEXICO LLC. ("Empire"), the Applicant in the above-captioned matter, state and affirm the following:

I caused notice of the applications to be sent by certified mail through the United States Postal Service on November 17, 2023, to the party that is the subject of the applications, that is, Goodnight Midstream Permian LLC. A sample notice letter is attached hereto as Exhibit 2-A. The attached exhibit and Goodnight's appearance in these matters demonstrate to my satisfaction that notice was proper.

I affirm under penalty of perjury under the laws of the State of New Mexico that this statement is true and correct.

/s/ Sharon T. Shaheen February 10, 2025
SHARON T. SHAHEEN Date

EXHIBIT 2

MONTGOMERY & ANDREWS
LAW FIRM

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Email: sshaheen@montand.com
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November 17, 2022

Via U.S. Certified Mail, return receipt requested

Goodnight Midstream Permian LLC
5910 North Central Expressway, Suite 800
Dallas, TX 75206

Re: **Case No. 24018** – Application of Empire New Mexico LLC Revoke the Injection Authority Granted Under Order No. R-22026, Lea County, New Mexico – **Andre Dawson SWD #001 Operated by Goodnight Midstream Permian LLC**

Case No. 24019 – Application of Empire New Mexico LLC Revoke the Injection Authority Granted Under Order No. R-22027, Lea County, New Mexico – **Ernie Banks SWD #001 Operated by Goodnight Midstream Permian LLC**

Case No. 24020 – Application of Empire New Mexico LLC Revoke the Injection Authority Granted Under Order No. SWD-2307, Lea County, New Mexico – **Ryno SWD #001 f/k/a Snyder SWD Operated by Goodnight Midstream Permian LLC**

Case No. 24021 – Application of Empire New Mexico LLC Revoke the Injection Authority Granted Under Order No. R-22506, Lea County, New Mexico – **Rocket SWD #001 Operated by Goodnight Midstream Permian LLC**

Case No. 24022 – Application of Empire New Mexico LLC Revoke the Injection Authority Granted Under Order No. SWD-2391, Lea County, New Mexico – **Pedro SWD #001 Operated by Goodnight Midstream Permian LLC**

Case No. 24023 – Application of Empire New Mexico LLC Revoke the Injection Authority Granted Under Order No. R-22030, Lea County, New Mexico – **Verlander SWD #001 Operated by Goodnight Midstream Permian LLC**

REPLY TO:
325 Paseo de Peralta
Santa Fe, New Mexico 87501
Telephone (505) 982-3873 • Fax (505) 982-4289

Post Office Box 2307
Santa Fe, New Mexico 87504-2307

Exhibit 2-A

Case No. 24024 – Application of Empire New Mexico LLC Revoke the Injection Authority Granted Under Order No. R-20855, Lea County, New Mexico – **Nolan Ryan SWD #001 Operated by Goodnight Midstream Permian LLC**

Case No. 24025 – Application of Empire New Mexico LLC Revoke the Injection Authority Granted Under Order No. R-21190, Lea County, New Mexico – **Sosa SA 17 SWD Well No. 2 Operated by Goodnight Midstream Permian LLC**

Case No. 24026 – Application of Empire New Mexico LLC Revoke the Injection Authority Granted Under Order No. SWD-2075, Lea County, New Mexico – **Ted 28 SWD Well No. 1 Operated by Goodnight Midstream Permian LLC**

Case No. 24027 – Application of Empire New Mexico LLC Revoke the Injection Authority Granted Under Order No. R-20865, Lea County, New Mexico – **Yaz 28 SWD Well No. 1 Operated by Goodnight Midstream Permian LLC**

TO WHOM IT MAY CONCERN:

This will advise that Empire New Mexico LLC ("Empire") has filed the following applications with the New Mexico Oil Conservation Division seeking to revoke the authority of Goodnight Midstream Permian LLC to dispose of salt water under the permits identified below.

Case No. 24018. ***Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Order No. R-22026 for the Andre Dawson SWD #001 Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico.*** Applicant in the above-styled cause seeks an order revoking the injection authority granted by Order No. R-22026, SWD-2403, issued in Case No. 21569 on February 7, 2022, to dispose of produced water in the Andre Dawson SWD #1 well, API# 30-025-50634 ("Well"), a produced water disposal well located 1105' FSL and 244' FEL (Unit P) of Section 17, Township 21 South, Range 36 East, in Lea County, NM. The approved injection zone is the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 6.5 miles Northwest of Eunice City, New Mexico.

Case No. 24019. Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Order No. R-22027 for the Ernie Banks SWD #001 Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Order No. R-22027, issued in Case No. 21570 on February 7, 2022, to dispose of produced water in the Ernie Banks SWD #1 well, API# 30-025-50633 ("Well"), a produced water disposal well located 395 feet from the North line and 1203 feet from the West line (Unit D) of Section 17, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico. The approved injection zone is the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 8.4 miles Northwest of Eunice City, New Mexico.

Case No. 24020. Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Administrative Order No. SWD-2307 for the Ryno SWD #001 f/k/a Snyder SWD Well Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Administrative Order No. SWD-2307, issued on November 2, 2017, to dispose of produced water in the Ryno SWD #001 f/k/a Snyder SWD Well No. 1, API# 30-025-43901 ("Well"), a produced water disposal well located 1450 feet from the North line and 708 feet from the East line (Unit H) of Section 17, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico. The approved injection zone is the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 7.7 miles Northwest of Eunice City, New Mexico.

Case No. 24021. Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Order No. R-22506 for the Rocket SWD Well No. 1 Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Order No. R-22506, issued in Case No. 21527 on March 2, 2023, to dispose of produced water in the Rocket SWD Well No. 1, API# 30-025-pending ("Well"), a produced water disposal well to be located 565 feet from the South line and 245 feet from the West line (Unit M) of Section 28, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico. The approved injection zone is the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 7 miles West of Eunice City, New Mexico.

Case No. 24022. Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Administrative Order No. SWD-2391 for the Pedro SWD #001 Well Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the

injection authority granted by Administrative Order No. SWD-2391, to dispose of produced water in the Pedro SWD #1 well, API# 30-025-50079 ("Well"), a produced water disposal well located 1,045' FSL and 1,067' FEL (Unit M) of Section 28, Township 21 South, Range 36 East, in Lea County, NM. The approved injection zone includes the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 19 miles southwest of Hobbs, New Mexico.

Case No. 24023: Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Order No. R-22030 for the Verlander SWD #001 Well Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Order No. R-22030, issued in Case No. 20825 on February 16, 2022, to dispose of produced water in the Verlander SWD #001 well, API# 30-025-50632 ("Well"), a produced water disposal well located 2,482' FNL and 1,277' FEL (Unit H) of Section 12, Township 21 South, Range 36 East, in Lea County, NM. The approved injection zone includes the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 5 miles northwest of Eunice, New Mexico.

Case No. 24024. Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Order No. R-20855 for the Nolan Ryan SWD #001 Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Order No. R-20855, issued in Case No. 20555 on September 12, 2019, to dispose of produced water in the Nolan Ryan SWD #001 well, API# 30-025-45349 ("Well"), a produced water disposal well located 779 feet from the South line and 1995 feet from the East line (Unit O) of Section 13, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico. The approved injection zone is the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 4 miles Northwest of Eunice City, New Mexico.

Case No. 24025. Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Order No. R-21190 for the Sosa SA 17 SWD Well No. 2 Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Order No. R-21190, issued in Case No. 20721 on March 2, 2020, to dispose of produced water in the Sosa SA 17 SWD Well No. 2, API# 30-025-47947 ("Well"), a produced water disposal well located 470 feet from the South line and 1815 feet from the West line (Unit N) of Section 17, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico. The approved injection zone is the San Andres formation, an interval which

is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 7.3 miles Northwest of Eunice City, New Mexico.

Case No. 24026. Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Administrative Order No. SWD-2075 for the Ted 28 SWD Well No. 1 Well Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Administrative Order No. SWD-2075, issued on Feb. 24, 2020, to dispose of produced water in the Ted 28 SWD Well No. 1, API# 30-025-44386 ("Well"), a produced water disposal well located 2,402' FNL and 1,911' FWL (Unit F) of Section 28, Township 21 South, Range 36 East, NMPM, in Lea County, NM. The approved injection zone includes the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 7 miles Northwest of Eunice, New Mexico.

Case No. 24027. Application of Empire New Mexico LLC to Revoke the Injection Authority Granted Under Order No. R-20865 for the Yaz 28 SWD Well No. 1 Operated by Goodnight Midstream Permian LLC, Lea County, New Mexico. Applicant in the above-styled cause seeks an order revoking the injection authority granted by Order No. R-20865, issued in Case No. 20558 on September 17, 2019, to dispose of produced water in the Yaz 28 SWD Well No. 1, API# 30-025-46382 ("Well"), a produced water disposal well located 230' FNL and 236' FEL (Unit A) of Section 28, Township 21 South, Range 36 East, NMPM, in Lea County, NM. The approved injection zone includes the San Andres formation, an interval which is potentially productive of hydrocarbons since the advent of horizontal drilling. The Well is located approximately 7 miles west of Eunice, New Mexico.

The attached applications will be set for hearing before a Division Examiner at the New Mexico Oil Conservation Division. During the COVID-19 Public Health Emergency, state buildings are closed to the public and hearings will be conducted remotely. The hearing will be conducted on **December 7, 2023,** beginning at 8:15 a.m. To participate in the electronic hearing, see the instructions posted on the docket for the hearing date: http://www.emnrd.state.nm.us/OCD/hearings.html. You are not required to attend this hearing, but as an owner of an interest that may be affected, you may appear and present testimony.

Failure to appear at that time and become a party of record will preclude you from challenging these applications at a later time. If you intend to present testimony or evidence at the hearing, you must enter your appearance by **November 29, 2023**, and serve the Division, counsel for the Applicant, and other parties with a pre-hearing statement by **November 30, 2023**, in accordance with Division Rule 19.15.4.13 NMAC.

Goodnight's counsel at Holland & Hart has been provided with courtesy copies of the attached applications. Please have them contact me or my co-counsel in these matters if you have any questions about these applications.

Very truly yours,

/s/ Sharon T. Shaheen
Sharon T. Shaheen

Ec:

Empire New Mexico LLC
Dana Hardy
Ernest Padilla

Cc by certified mail:

Bureau of Land Management
414 W. Taylor
Hobbs, NM 88240-1157

State Land Office
310 Old Santa Fe Trail
Santa Fe, NM 87501

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

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

CASE NOS. 23614-23617

APPLICATION OF GOODNIGHT MIDSTREAM PERMIAN LLC TO AMEND ORDER NO. R-22026/SWD-2403 TO INCREASE THE APPROVED INJECTION RATE IN ITS ANDRE DAWSON SWD #1, LEA COUNTY, NEW MEXICO.

CASE NO. 23775

APPLICATIONS OF EMPIRE NEW MEXICO LLC TO REVOKE INJECTION AUTHORITY, LEA COUNTY, NEW MEXICO

CASE NOS. 24018-24020, 24025

APPLICATION OF GOODNIGHT PERMIAN MIDSTREAM, LLC FOR APPROVAL OF A SALTWATER DISPOSAL WELL, LEA COUNTY, NEW MEXICO.

DIVISION CASE NO. 24123
ORDER NO. R-22869-A

DEPOSITION OF THOMAS TOMASTIK
December 10, 2024
9:00 a.m. MST

PURSUANT TO NMSA 1978, §70-2-8 and Rule 19.15.4.16.A NMAC, this Deposition was:
TAKEN BY: Ernest Padilla, Esq.
Attorney for Empire New Mexico

REPORTED BY: Barbara Jean Morgenweck
NCRA, RPR, NM CCR No. 526

Exhibit 3

at that.
Q. I believe there are four and there is some applications to increase injection rates on maybe one or two wells, so I am going to have quite a bit of water going in there, produced water, if Goodnight's application is approved, correct?
A. Yes.
Q. You're telling me that as far as you know, there are no corrosion issues with the injection wells that Goodnight is operating in the EMSU?
A. Correct.
I am not aware of any corrosion issues, but as you see in my self-affirmed testimony, I do discuss their treatment protocols.
Q. Well, you mention four treatment protocols. I think three of them are called or some form of dissolver. What's your understanding of what an dissolver does?
A. I don't understand what you mean by dissolver.
Q. Well, you named -- you named four treatment programs that Goodnight is doing on its -- on its injection wells, and they're using

three kinds of dissolvers. Do you know what an dissolver does for treating produced water?
A. Typically, based on my experience and expertise with Class 2 injection, your main chemical treatment programs address scaling issues which can be iron sulfates, barium sulfates, and you're also addressing the corrosion issues with corrosion inhibitors. You're addressing the back micro bacterial issues with sulphur reducing bacteria and iron precipitating bacteria with some sort of bioside to kill the bacteria to prevent it from forming down hole and precipitating solids down hole that can plug off the injection formation. And I have listed those that they use in their treatment in my testimony.
Q. You don't know how they work; is that what you're telling me?
A. Repeat that?
Q. You don't know how the dissolvers work. Is that what you're telling me?
A. Most of the treatment chemicals that I have listed that they -- Goodnight has provided me are inhibitors to prevent the formation of scale to prevent the bacteria formations down

hole and to alleviate potential corrosion problems in the injection wells.
Q. Is there any solid waste that is filtered out when -- by Goodnight and its operations?
A. Again, I believe in my testimony that they use rock baskets and a hundred micron filters to filter out the larger potential solid material in the fluids.
Q. Where is -- where does that solid waste go to?
A. I'm not sure. I assume to approved landfill disposal.
Q. I suppose you don't know how much solid waste is filtered out, correct?
A. No.
Q. The next item that you mention in this paragraph is assessment of Empire's claims that there is communication between the Grayburg and San Andres formations.
Now your assessment in your paper says that there is some permeable barriers -- barrier between the Grayburg and the San Andres; is that correct?
A. Yes.

Q. You didn't pick the top of the San Andres, right?
A. No.
Q. Where did you get the information that there's an impermeable barrier between the Grayburg and San Andres?
A. The evaluation of the open hole logs provided by Goodnight and their cross sections.
Q. Who specifically provided that? Is that Mr. McGuire?
A. Yes.
Q. Is Mr. McGuire a geologist; do you know?
A. Yes.
Q. Okay. So have you read the -- the Empire expert witnesses on where the top of the San Andres is?
A. Yes.
Q. What is that -- your understanding of that testimony?
A. There is differences in the selection of where the top of the San Andres occurs. I relied on the top of the San Andres picks that were provided by Goodnight Midstream except where I would reference well completion records or from Chevron or XTO. Then I would have used

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APPLICATIONS OF GOODNIGHT MIDSTREAM PERMIAN LLC FOR APPROVAL OF SALTWATER DISPOSAL WELLS LEA COUNTY, NEW MEXICO, DIV. CASE NOS. 23614-23617

APPLICATION OF GOODNIGHT MIDSTREAM PERMIAN, LLC TO AMEND ORDER NO. R-22026/SWD-2403 TO INCREASE THE APPROVED INJECTION RATE IN ITS ANDRE DAWSON SWD #1, LEA COUNTY, NEW MEXICO. DIV. CASE NO. 23775

APPLICATIONS OF EMPIRE NEW MEXICO LLC TO REVOKE INJECTION AUTHORITY LEA COUNTY, NEW MEXICO.
DIV. CASE NOS. 24018-24020
24025

DEPOSITION OF JOHN McBEATH
November 25, 2024
9:01 a.m.
Via Zoom

PURSUANT TO THE FEDERAL RULES OF CIVIL PROCEDURE, this deposition was:

TAKEN BY: DANA SIMMONS HARDY, ESQ.
ATTORNEY FOR EMPIRE

REPORTED BY: KENDRA D. TELLEZ, RMR-CRR-RPR
Kendra Tellez Court Reporting, Inc.
A Veritext Company
Suite 105
500 4th Street, Northwest
Albuquerque, New Mexico 87102

Exhibit 4

A. Other than who? Other than me?
Q. Well, did you meet with the other witnesses regarding preparation of testimony?
A. I've had some virtual meetings with the Netherland Sewell's group, which would include two of the other witnesses.
Q. Okay.
A. Knights and Davidson.
Q. Okay. And then did you have meetings virtually or otherwise with Dr. Lake?
A. Yes.
Q. And about how many times did you meet with Dr. Lake?
A. I think I had two -- Kim and I had two face-to-face meetings with him over the summer, and we had several Teams meetings, I'd say.
Q. And approximately how many times did you meet with Mr. Davidson?
A. I can recall two virtual meetings with Netherland Sewell.
Q. Okay. And did that also include Mr. Knights?
A. It did, yes.
Q. Okay. And did you -- in preparing for your deposition, did you have any meetings with

Goodnight's other witnesses?
A. Well, Preston McGuire was present in one of those depo prep meetings, yes.
Q. And were Goodnight's lawyers also present?
A. Yes.
Q. Is there anything else that you did to prepare for your deposition?
A. Not beyond what we've discussed already.
Q. Let's look at your testimony, which I marked as Exhibit 2 to your deposition. And I've got it pulled up, and I'm hoping that my screen will cooperate. Let me share it.
A. I'm just rearranging some furniture to try to get this microphone closer to me.
Q. Okay.
A. If you hear something.
Q. Can you see my screen now?
A. Yes, I can.
Q. And did you personally prepare your testimony for this matter?
A. Yes, I did.
Q. Did anyone assist you?
A. I believe Kim Gordon read drafts of my testimony and commented and maybe recommended changes or things like that, or additions.

Q. We spoke about the testimony you reviewed from the other witnesses. Who, if any, of Goodnight's other witnesses are you relying on for your testimony?
Oh, you're cutting out.
Can't hear you.
A. Can you hear me now?
Q. Yes.
A. It's worse when I brought it closer to me, so . . .
Do you think it's worth trying to reboot or change something? Because, I mean, we are going to go crazy with this today.
MS. HARDY: I think that's good a good idea. Should we take a ten-minute break?
THE WITNESS: Yes.
MR. RANKIN: No objection.
MR. MOANDER: No objection.
(Off the Record.)
Q. So I think my last question was whether you're -- which other Goodnight witnesses' testimony you are relying on for your testimony?
A. Preston McGuire for sure, Jim Davidson, Mr. Knights, and I think the other ones are more tangential. Those would be the three principal.

Q. Okay. I wanted to show you here -- I'm going to switch for a minute. We'll go back to your testimony certainly, but I wanted to mark as an exhibit the prehearing order in this case, which I've got up on the screen. And I believe that would be Exhibit 3.
(Exhibit 3 Referred to in Deposition.)
Q. Have you seen this Pre-hearing Order previously?
A. I have, yes.
Q. Okay. And paragraph 7 of the order requires the parties to provide copies of documents that their experts relied on in preparation of their hearing testimony. Is that your understanding?
A. Yes.
Q. Okay. And I have a number of documents that have been produced on your behalf. I believe it's about 1,239 pages of documents and data files. Does that sound about right to you?
A. The number is not that meaningful to me. I would probably need to just look at them.
Q. I'm going to pull them up so we can go through them. I don't want to mark all of them as exhibits, certainly, but I wanted to find out from you exactly what the documents are and how you're

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APPLICATIONS OF GOODNIGHT MIDSTREAM PERMIAN LLC FOR APPROVAL OF SALTWATER DISPOSAL WELLS LEA COUNTY, NEW MEXICO, DIV. CASE NOS. 23614-23617
APPLICATION OF GOODNIGHT MIDSTREAM PERMIAN, LLC TO AMEND ORDER NO. R-22026/SWD-2403 TO INCREASE THE APPROVED INJECTION RATE IN ITS ANDRE DAWSON SWD #1, LEA COUNTY, NEW MEXICO. DIV. CASE NO. 23775

APPLICATIONS OF EMPIRE NEW MEXICO LLC TO REVOKE INJECTION AUTHORITY LEA COUNTY, NEW MEXICO.
DIV. CASE NOS. 24018-24020
24025

DEPOSITION OF DR. LARRY LAKE
November 12, 2024
9:00 a.m.
Via Zoom

PURSUANT TO THE FEDERAL RULES OF CIVIL PROCEDURE, this deposition was:

TAKEN BY: SHARON T. SHAHEEN, ESQ.
ATTORNEY FOR EMPIRE
REPORTED BY: KENDRA D. TELLEZ, RMR-CRR-RPR
Kendra Tellez Court Reporting, Inc.
A Veritext Company
Suite 105
500 4th Street, Northwest
Albuquerque, New Mexico 87102

Exhibit 5

McBeath's work; is that right?
A. Yes.
Q. And that you spoke with McBeath in preparation?
A. Yes.
Q. And what was the topic of your conversation with McBeath?
A. Well, let's see. It was all about this case. Basically, it was about the behavior of pressures in reservoirs. Basically, it was about the interpretation of logs. Other things would have been -- what else would we have talked about? Briefly about ROZ zones and things like that.
Q. And did you rely on his work in your report?
A. Well, that's a hard question to answer, because what I tried -- I'm sorry. I'll give you an "I don't know" on that because it's more complicated. I would try to form an opinion myself and then discuss it with him back and forth to where we came to an agreement.
Q. And I believe you were -- you were talking about some exhibits from Preston McGuire that you identify in your report. And did you rely on some of his work in your opinions?

A. Yes.
Q. Anyone else that you can recall that you relied on their work in your opinions?
A. Maybe. I don't recall beyond that.
Q. Okay. Well, as we go through your statement, your opinions, if you -- if something comes to mind about "Oh, yes, I remember now. I relied on this," feel free to speak up and let me know.
And now turning back to your Exhibit 1, did you personally prepare your report for this matter?
A. The testimony, yes, I did.
Q. Okay. And did you have any assistance in preparing that report?
A. Do you mean did I ask somebody to read it and give me comments? Yes, I did do that.
Q. Okay. And other than your attorneys -- or Goodnight's attorneys, who did you ask to review it for you?
A. McBeath and Kim Gordon.
(Exhibit 3 Referred to in Deposition.)
Q. Okay. I want to turn briefly now to a scheduling order that was entered in this case. And I will try to share my screen once again here.

So I'll represent to you, Dr. Lake, that this was an order that was entered in this case. And with respect to witnesses, I'll turn -- I'll direct you to paragraph 7 here.
Do you see that at the bottom of this page?
A. Your -- my CV is at the front of the screen. It's covering this up.
Q. What about now?
A. Still there.
Q. Let me stop and do this again.
A. I'm sorry, that was me. That was my document search. So just go back where you were.
Q. Okay. Do you see it now where it says Pre-Hearing Order?
A. Yes, I see that.
Q. Okay. Great. So I direct you to paragraph 7 because this is what pertains to the witnesses.
So here you'll see that the parties agree to provide copies of documents that their witnesses relied on and referenced in their testimony and exhibits. Did your attorneys ask you to provide those documents to them?
A. I believe they asked me through ATXCE. So

all the requests that went, went to ATXCE and then on to the attorneys.
Q. And then did you provide ATX -- I have it down as ACPE; is that right? Austin Consulting?
A. I think I may have written that down once myself, but it's ATXCE, it's Austin Texas Consulting Engineers.
Q. Okay. I think I'm going to refer to them as Austin Consulting Engineers. Will that work for you?
A. Yes.
Q. Okay. Did you provide Austin Consulting Engineers with documents to produce in this proceeding?
A. Are you referring to a specific document or to -- just in general?
Q. Just in general for now. We're going to come back to the documents that you did produce.
A. I did.
Q. Okay. And so is it your understanding that you provided them with everything you relied on to support your opinions in this matter?
MR. JURGENSEN: Objection, form.
Q. You can answer if you understand the question.

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APPLICATIONS OF EMPIRE NEW MEXICO LLC TO REVOKE INJECTION AUTHORITY, LEA COUNTY, NEW MEXICO.	DIV. CASE NOS. 24018-2420, 24025

REMOTE ORAL DEPOSITION OF

JAMES A. DAVIDSON

November 22, 2024

REMOTE ORAL DEPOSITION OF JAMES A. DAVIDSON, located in Dallas, Texas, produced as a witness at the instance of Empire New Mexico LLC, and duly sworn, taken in the above-styled and numbered cases on November 22, 2024, from 10:03 a.m. to 3:26 p.m., before Joseph D. Hendrick, Certified Shorthand Reporter in and for the State of Texas, reported by machine shorthand, pursuant to subpoena issued by the New Mexico Oil Conservation Commission, and any provisions stated on the record or attached hereto.

Exhibit 6

-- in the Seminole San Andres unit wells, we ran the model and then compared it to some of the core work that Hess had published and see if we were coming up with reasonable matches to the core measurements.
Q. I think we're about ready to jump to your report. And I am going to share my screen again.
MS. SHAHEEN: Does everyone see Dr. Davidson's statement here? I'm on page 3.
MR. MOANDER: Yes.
THE WITNESS: Yeah, I can see it.
Q. (BY MS. SHAHEEN) And, Dr. Davidson, can you read it?
A. I can read a copy of my hard copy. I can't see it on the screen, but I can probably get it on the hard copy I have.
Q. Okay. Well, if you'll just let me know if -- if you need Jonathan's assistance, we'd like to have him on camera when he's helping you. And we can take some time to make that happen.
A. I can move over and he can help. Not quite. You can almost see him. Let me move over more. And now I'm not in. All right. Now we're both in.
Q. Thank you so much.
So, here on pages 3 and 4, you have provided a summary of your opinions.

A. Mm-hmm.
Q. And taking a look first at this bullet three here where my hand is on the screen, it says, "A residual oil zone analogous to those where CO2 enhanced oil recovery operations have been employed exists only in the Grayburg formation in the EMSU."
A. Okay.
Q. Is that correct?
A. Yes.
Q. Would you agree that this opinion is dependent on where the top of the San Andres is picked?
A. Would be.
Q. And how was the top defined?
A. I was given the tops. I don't make any effort to pick the tops. Those were provided by Goodnight.
Q. And do you know who picked the tops that were provided?
A. I do not. I suspect -- the geologist from Goodnight is Preston McGuire. I assume that Preston picked them, but I don't know that to be the case. Just an assumption on my part.
Q. So, you didn't make any effort to verify the tops that you were provided?
A. No. That's -- I don't know that anybody

can -- to be honest with you, I don't know that anybody can reliably pick that unless we get paleontological data of some type.
Q. I'm sorry, you said what kind of data?
A. Like paleo data, critters, bugs, you know, fossils. That sort of thing maybe could be used. I don't know. Again, I'm not a geologist. I don't make zone picks.
Q. Did you see any distinct demarker on logs indicating that -- the top of the San Andres?
A. No.
Q. Turning now to bullet four. And we're going to actually switch back and forth between bullet four and figure 4.
A. Okay.
Q. At the top of page 4, "The intervals of residual oil in the San Andres aquifer are too thin, too widely spaced, and are not likely areally continuous enough to support efficient enhanced recovery operations." Is that correct?
A. Yes.
Q. Can you provide some clarification on why you are stating that the potential San Andres ROZ is too thin and too widely spaced, when you are showing continuous oil saturation on the EMSU 746 log

interpretation, which is figure 4? And I can jump to that now. Let me see if I can get the right page.
So, this is figure 4, and I believe this relates to that opinion that we just were reviewing. It's the EMSU -- well, actually, this might be figure -- yeah, this is it -- the EMSU 746 interpretation?
THE WITNESS: Is that in the appendix? That doesn't look like a complete figure...
(Indiscernible discussion between Dr. Davidson and Jonathan.)
THE REPORTER: I'm sorry, I'm not hearing what Dr. Davidson is saying.
THE WITNESS: Okay. Well, we're just trying to -- I'm just trying to find the figure she's pointing to.
A. This is -- the figure you're pointing to is just a gamma ray log, not an interpretation -- not the interpreted response. What you see in the left-hand track is just a gamma ray readings. The actual interpretation of this well is in the appendix, I believe.
THE WITNESS: Actually, does this one not show up on the one where we show the comparison with the Seminole San Andres. Let's refer to the one that's

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QUESTIONS

Action 430339

QUESTIONS

Operator: Empire New Mexico LLC 2200 S. Utica Place Tulsa, OK 74114	OGRID: 330679
	Action Number: 430339
	Action Type: [HEAR] Prehearing Statement (PREHEARING)

QUESTIONS

Testimony

Please assist us by provide the following information about your testimony.

Number of witnesses	11
Testimony time (in minutes)	180