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

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

CASE NO. 20406
ORDER NO. R-20655

APPLICATION OF WISHBONE TEXAS OPERATING COMPANY, LLC FOR REINSTATEMENT OF INJECTION WELL PERMITS TO ENHANCE OIL RECOVERY IN THE DENTON DEVONIAN WATERFLOOD PROJECT, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on April 4, 2019, at Santa Fe, New Mexico, before Examiners Phillip R. Goetze, Michael A. McMillan, and Terry Warnell.

NOW, on this 24th day of June 2019, the Division Director, having considered the testimony, the record and the recommendations of the Examiners,

FINDS THAT:

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

(2) By Order No. R-13387 issued in Case No. 14612 on May 5, 2011, the Division authorized Celero Energy II, LP ("Celero") to institute a cooperative waterflood project, designated as the **Denton Devonian Waterflood Project**, in the Denton-Devonian Pool (Pool Code 16910) comprised of the following described 320 acres (more or less) of fee lands located in Lea County, New Mexico:

TOWNSHIP 14 SOUTH, RANGE 37 EAST, NMPM

Section 25:	S/2 SW/4	(Buckley Lease)
Section 36:	W/2 NE/4	(W.T. Mann Lease)
Section 36:	NW/4	(T.D. Pope 36 Lease)

(3) The Division further authorized Celero to inject produced Devonian water into the Devonian formation through the following two "Wells", in Lea County, New Mexico:

Well Name & Number	API No.	Well Location	Inject. Zone
W T Mann A Well No. 2	30-025-05204	Section 36, T14S, R37E	12376-12900
T D Pope 36 Well No. 10	30-025-39999	Section 36, T14S, R37E	12175-12720

(4) Injection into the "Mann" well began in July of 2011 with Celero as the operator. Celero transferred the project (both wells) to Resolute Natural Resources Co., LLC ("Resolute") in March of 2013. The "Pope" well was converted from production to injection in January of 2011 and the last month of injection was October of 2011. The last month of reported injection into the Mann well was November of 2013; therefore, the injection authority into the project terminated *ipso-facto* in December of 2014. Resolute transferred the project to Wishbone Texas Operating Company, LLC (the "Applicant" or "Wishbone") in March of 2017.

(5) Wishbone now seeks an order to reactivate the permits allowing injection into the same two wells, for purposes of waterflooding into the Denton Devonian Waterflood Project.

(6) Wishbone further requested in the application that the Division affirm the Denton Devonian Waterflood Project as effective and qualified for the recovered oil tax rate ("recovered oil tax rate") pursuant to the Enhanced Oil Recovery Act and Division regulations since approval of the project by Division Order No. R-13387, issued on May 5, 2011.

(7) Applicant appeared at the hearing through counsel and presented evidence to the effect that:

(a) For the Mann well, the Devonian formation top is at 12371 feet. The proposed perforated injection interval is from 12370 feet to 12900 feet and it will inject fluids through a plastic-lined, 4½-inch (OD) tubing set in a packer at 12251 feet.

(b) The Mann well is 170 feet lower in structure than the Pope well and has never produced oil or gas as has the Pope well.

(c) The Mann well was permitted for salt water disposal in December of 2010 with administrative order SWD-1257, but never used under that permit.

(d) The Mann well has been constructed with the following three casing strings and liner system: 13⅜ surface casing set at 320 feet; 9⅝-inch intermediate casing set at 4788 feet - cemented to 1310 feet; 7-inch intermediate casing set at 12629 feet - cemented to 11175 feet; and a 4-1/2-inch liner set from 12258 feet to 12971 feet - circulated with cement.

(e) For the Pope well, the Devonian formation top is at 12201 feet. The proposed perforated injection interval is from 12227 feet to 12504 feet and it will inject fluids through a plastic-lined, 3-1/2-inch (OD) tubing set in a packer inside the liner at 12040 feet.

(f) The Pope Well has been constructed with the following three casing strings and liner system: 13⅜ surface casing set at 335 feet; 9⅝-inch intermediate casing set at 4790 feet; 7-inch intermediate casing set at 12185 feet - cemented to 9250 feet; and a 4-1/2-inch liner is set from 12038 feet to 12760 feet - circulated with cement.

(g) Wishbone operates several Devonian wells, so the primary sources of produced water will be wells with production from the Devonian and the Wolfcamp formations. Produced water from the San Andres formation may also be used as make-up water.

(h) The Devonian formation within the proposed waterflood is a dolomite of low porosity. It is continuous and approximately 600 feet thick.

(i) The recovery drive mechanism appears to be a combination of gas expansion and water drive. The limited injection to date coincides with increased oil and gas recovery.

(j) The analyses of produced water samples provided by Applicant showed the compatibility of the injection fluids with formation fluids in the proposed disposal interval.

(k) The maximum surface pressure for the Mann Well will be 2474 pounds per square inch (psi). The maximum surface pressure for the Pope Well will be 2445 pounds per square inch (psi).

(l) Applicant stated 27 wells penetrated the Devonian formation within the one-half mile Area of Review and six of these are plugged and abandoned.

(m) The Applicant states that approximately 150 feet of Woodford Shale provides an upper confining layer for the proposed disposal interval while approximately 500 feet of the remainder of the Simpson group (excluding the Ellenburger formation) provide a lower confining layer.

(n) The proposed construction of the subject wells will isolate and protect the underground sources of drinking water (USDWs) identified as the Ogallala Aquifer Area from any disposal activities by the subject wells.

(o) Based on the records of the New Mexico Office of the State Engineer, there are 142 fresh water wells within one mile of the surface location of the subject wells. The Applicant stated that inspections by a consultant to obtain water samples found each of these wells to be plugged and abandoned.

(p) Based on the application of a risk assessment model (the *Fault Slip Potential* software tool; Stanford Center for Induced and Trigger Seismicity; 2017) with publicly-available data, there was an extremely low probability of any induced-seismic event occurring during the operational lifespan of injection activity for the Subject Well.

(q) The project is comprised of three leases, each of which are currently Held by Production (HBP) and each are majority owned by Wishbone. The cooperative agreement between the owners within the three leases is still in effect.

(r) Applicant agreed to provide an annual plan of operation for the Project.

(s) Applicant withdrew its request in this application for certification for the recovered oil tax rate, by a Motion to Dismiss submitted to the Division on April 12, 2019.

(t) The Applicant provided evidence of notification of this application to all "*affected persons*" within a one-mile radius of both the surface and bottom-hole locations of the Subject Well and with publication in a newspaper of general circulation in the county.

(8) No other party appeared at the hearing, or otherwise opposed the granting of this application.

(9) Subsequent to the hearing on October 18, 2018, Wishbone provided a produced water sample from the San Andres formation.

The Division concludes as follows:

(10) The application has been duly filed under the provisions of Division Rule 19.15.26.8 NMAC and Wishbone has presented satisfactory evidence that all requirements prescribed in Division Rule 19.15.26.8 NMAC have been met.

(11) The construction plans for the Wells provided in the application are protective of USDWs.

(12) All wells that penetrate the proposed injection interval within a one-half mile AOR of the Wells are adequately cased and cemented to isolate and confine the injected fluid within the permitted injection interval.

(13) The Division is responsible for the orderly development and production of hydrocarbon resources including the authority to regulate the disposition of produced water as described in NMSA 1978, Section 70-2-12(B)(15). It is obligated to prevent waste, to protect correlative rights, and to protect human health and the environment.

(14) Under Division Order No. R-14392 (Case No. 15654), the Division determined that the increase in tubing size and the corresponding increase in injection rates necessitated additional information not previously incorporated into an administrative application for disposal wells with injection capacities greater than 20000 BWPD. This included, but was not limited to, the following specific subjects:

(a) the potential cumulative impacts to a common injection interval utilized by multiple disposal wells in proximity;

(b) the consideration that the area of review for penetrating wells based on a one-mile radius from the disposal well's surface location was adequate;

(c) the consideration that the notification of affected persons based on a one-half mile radius from the disposal well's surface location was protective of correlative rights; and

(d) addressing the induced-seismicity issue, especially with regards to the potential impacts of increased injection volumes into reservoirs with faulting and the determination of a lower confining layer to ensure injection fluids do not migrate out the permitted disposal interval.

(15) The Applicant offered evidence and testimony to sufficiently respond to the items of concerns brought forth by the Division in the findings of Division Order No. R-14392 as listed previously and later addressed in Commission Order No. R-14392-A (*de novo*).

(16) Applicant's motion to dismiss the portion of the application asking for certification of the project for use of the Recovered Oil Tax Rate should be granted.

(17) Subsequent to the Hearing, the Applicant provided a produced water sample from the San Andres formation in the near vicinity. Based on the water analysis, no compatibility issues exist with the San Andres formation and the Devonian formation.

(18) The evidence presented indicates that injection into this Devonian reservoir through these two initial "pilot" wells, will not harm oil and gas reserves. Undoubtedly, utilizing the Wells for injection will benefit by enabling Wishbone to activate production of surrounding producers, increase production rates, and thereby recover additional oil and gas that would not otherwise be recovered.

(19) Wishbone did not present a copy of the lease agreement but testified that the cooperative lease agreement was still in effect.

(20) To prevent waste of oil and gas and protect correlative rights, the proposed project should be approved.

(21) Subsequent to the hearing in this case, as of May 23, 2019, Wishbone has transferred the wells in this proposed waterflood to Ring Energy, Inc. ("Ring", OGRID 328599). Ring has an agreement covering inactive wells with the Compliance and Enforcement bureau of the Division and has posted bonding as needed.

IT IS THEREFORE ORDERED THAT:

(1) Wishbone Texas Operating Company, LLC as Applicant or its successor, Ring Energy, Inc. ("Ring" or "Operator") [OGRID 328599] is hereby authorized to implement enhanced oil recovery operations in the Devonian formation within an existing cooperative lease project, designated herein as the **Denton Devonian Waterflood Project** in the Denton-Devonian Pool (Pool Code 16910) comprised of the following described 320 acres (more or less) of fee lands located in Lea County, New Mexico:

TOWNSHIP 14 SOUTH, RANGE 37 EAST, NMPM

Section 25:	S/2 SW/4	(Buckley Lease)
Section 36:	W/2 NE/4	(W.T. Mann Lease)
Section 36:	NW/4	(T.D. Pope 36 Lease)

(2) Ring is further authorized to inject for purposes of enhanced oil recovery (only UIC Class II) produced waters into the Devonian formation, through the following two wells:

Well Name & Number	API No.	Well Location	Permitted Interval
W T Mann A Well No. 2	30-025-05204	B-36-T14S-R37E	12370-12900
T D Pope 36 Well No. 10	30-025-39999	D-36-T14S-R37E	12227-12504

(3) Injection shall be through internally plastic-coated tubing set in a packer. The permitted perforated depth interval, the tubing size, the packer setting depths, and the surface injection pressure limit shall be as follows:

Well Name & Number	Permitted Interval	Tubing	Packer	Pressure Limit
W T Mann A Well No. 2	12370-12900	4-1/2"	12251	2474
T D Pope 36 Well No. 10	12227-12504	3-1/2"	12040	2445

(4) Each of these wells is hereby limited to a maximum injection rate of no more than 20000 barrels of water per day. This order does not allow injection into formations below the Silurian including the Montoya formation and the Ellenburger formation (lower Ordovician) or lost circulation intervals directly on top and obviously connected to these formations.

(5) The portion of the application asking for certification of the project to the New Mexico Taxation and Revenue Department as an Enhanced Oil Recovery Project" **is dismissed**.

(6) Additional injection wells within this waterflood project may be approved only after notice and an examiner hearing.

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

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

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

(10) The Division Director may administratively authorize a pressure limitation in excess of the above, upon a showing supported by approved Step Rate Tests that such higher pressure will not result in the fracturing of the injection formation or confining strata or damage to the reservoir. Such proper showing shall also be demonstrated by evidence including but not limited to an amended assessment of induced-seismicity risks and calculation of a radius of influence representative of the proposed injection rate.

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

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

(13) The operator shall provide written notice of the date of commencement of injection to the Division's district office. The Operator shall submit monthly reports of the injection operations (maximum surface injection pressure, injection volume and days of operation) using the online version of Division Form C-115, in accordance with Division Rules 19.15.26.13 and 19.15.7.24 NMAC.

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

(15) The Division further stipulates the following "best management practices", included herein as additional requirements:

(a) The Wells shall be included in a Supervisory Control and Data Acquisition (SCADA) system for operation as an injection well.

(b) The Operator shall first contact the Division's District supervisor for approval of proposed remedial actions prior to initiating any recovery attempts should a failure of tubing occur with a loss of a tubing section within the Well(s).

(c) The Operator shall submit all well tests and performance reports to Division's District (attached to a Form C-103) and made part of the well file for future availability.

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

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

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

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

(20) The operator of this waterflood shall appear before the Division in the year 2024 (five years from the order date) and update the Division on the progress, production results, and expected plans of this waterflood. The progress report shall include an engineering analysis of the state of the waterflood.

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

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

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

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

ADRIENNE SANDOVAL
Director

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