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 FOR THE PURPOSE OF CONSIDERING:

CASE NO. 20313
ORDER NO. _____

CASE NO. 20314
ORDER NO. _____

APPLICATION OF MESQUITE SWD, INC. TO APPROVE PRODUCED WATER DISPOSAL WELL IN EDDY COUNTY, NEW MEXICO.

[PROPOSED] ORDER OF THE DIVISION

BY THE DIVISION:

These cases came on for hearing at 8:15 a.m. on May 31, 2019 and continued on June 28, 2019, at Santa Fe, New Mexico, before Examiners William V. Jones and Michael A. McMillan. Legal counsel for the Division was Mr. William Brancard.

NOW, on this ____ day of _____, 2019, the Division Director, having considered the testimony and the record,

FINDS THAT:

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

(2) Cases 20313, 20314, and 20472 were consolidated at hearing for testimony. One order is being issued for Cases 20313 and 20314, and a separate order is being issued for Case 20472.

(3) In Case No. 20313, ("Mesquite" or "Applicant") (OGRID No. 161968) seeks an order authorizing Mesquite to inject produced water into the Siluro-Devonian formation through the Laguna Salada 13 SWD #1 (API No. 30-025-___Pending) with a surface location 685 feet from the South line and 50 feet from the East line (Unit P) of Section 13, Township 23 South, Range 28 East, NMPM, Eddy County, New Mexico as an Underground Injection Control (UIC)

Class II well for commercial disposal of produced water through an open hole interval from approximately 14,500 feet to approximately 15,700 feet below the surface.

(4) In Case No. 20314, Mesquite seeks an order authorizing Mesquite to inject produced water into the Siluro-Devonian formation through the Laguna Salada 19 SWD #1 (API No. 30-025-___Pending) with a surface location 1752 feet from the South line and 1727 feet from the East line (Unit J) of Section 19, Township 23 South, Range 29 East, NMPM, Eddy County, New Mexico as an Underground Injection Control (UIC) Class II well for commercial disposal of produced water through an open hole interval from approximately 14,500 feet to approximately 15,700 feet below the surface.

(5) The Laguna Salada 13 and Laguna Salada 19 wells are referred to collectively herein as the Subject Wells.

(6) On or about July 25, 2018, Mesquite filed with the Division, two administrative applications for approval of the Subject Wells for produced water disposal.

(7) On December 13, 2018, Mesquite was notified by the Division that the applications were denied for administrative approval, and that the option to set the matter for hearing before a Division Examiner remained an option.

(8) On January 18, 2019, Mesquite submitted two hearing applications to the Division for approval of the Subject Wells for authority to inject produced water.

(9) On February 28, 2019, the Division entered its appearance in these cases.

(10) The Division protested the administrative applications. Apart from the Division's protest, there were no unresolved administrative protests and no party other than the Division objected to the granting of Mesquite's applications at the hearing. Transcript ("Trans.") Vol. 1 at 40, lines 16-25; 41, lines 1-7. Kaiser-Francis Oil Company entered an appearance in case number 20314, but did not appear at the hearing or oppose case number 20314 at the hearing.

(11) The hearing for Case Numbers 20313 and 20314 cases was originally set for March 7, 2019.

(12) After the Division continued these cases several times, the hearing was held over two days, May 31, 2019, and June 28, 2019.

(13) Solaris Water Midstream, LLC and Blackbuck Resources, LLC appeared at the hearing, but for the limited purpose of being able to incorporate the testimony from this hearing into their cases, Case No. 20465 and Case No. 20463, respectively.

(14) Mesquite appeared at the hearing through counsel and presented four witnesses: Riley Neatherlin, Dr. Kate Zeigler, Scott Wilson, and Todd Reynolds. Mesquite offered evidence demonstrating the following:

(a) Notice of the hearing and Mesquite's hearing examiner application was provided to all affected parties.

(b) Mesquite is not contesting the Division's decision to use a 1.5-mile screening tool for applications submitted after December 2018, but is contesting the use of the 1.5-mile screening tool to Mesquite's applications filed in July 2018 and September 2018, before the Division determined to use the 1.5-mile screening tool. Trans. Vol. 1 at 35, lines 23-25; *id.* at 36, lines 1-5.

(c) At the time it submitted its administrative applications, Mesquite complied with what it believed was the current spacing requirement, *i.e.*, one-mile separation between wells. Trans. Vol. 1 at 35, line 18; *id.* at 36, lines 14-15.

(d) Mesquite was not provided notice of the Divisions decision to use a 1.5-mile screening tool until Mesquite's Laguna Salada administrative applications were denied. Trans. Vol. 1 at 35, lines 19-22; *id.* at 57 to 58.

(e) Mesquite testified regarding the following information with respect to the construction, operation, and location of the Subject Wells.

- Mesquite submitted complete C-108s for the Subject Wells and received no information from OCD stating that the application was incomplete or deficient in any way. Trans. Vol. 1 at 41; *see also* Exhibit 1-A and 1-B.

- For the Laguna Salada 13 well:

    - Mesquite proposed a commercial operation with a maximum daily injection rate of 40,000 barrels of water per day (BWPD) using a maximum surface injection pressure of 2,900 pounds per square inch (psi). Mesquite proposes an average anticipated daily injection rate of 30,000 BWPD. Mesquite is willing to, as a condition of this Order, reduce the maximum daily rate by 5,000 barrels, to 35,000 BWPD maximum daily injection rate.

    - Mesquite seeks to drill the Laguna Salada 13 to an approximate total depth of 15,700 feet below surface. The injection will occur through an

open borehole from approximately 14,500 feet to approximately 15,700 feet below surface.

- The Laguna Salada 13 will be constructed with the following four casing strings and liner system: 20-inch surface casing set at 350' feet; 13 3/8-inch intermediate casing set at 2650 feet; 9 5/8--inch intermediate casing set at 9900 feet; and a 7 5/8-inch liner (with a weight of 39 pounds per foot) set from 9400 feet to a total depth of 14500 feet.

- All three casings will have cement circulated to the surface while the liner will have cement circulated to the top of the liner.

- The Laguna Salada 13 will inject fluids through a tapered tubing set consisting of fiberglass lined, $5^1/_2$-inch outside diameter (OD) tubing within the liner and plastic-lined, 7-inch OD tubing above the liner. The tubing is attached to a packer set no shallower than 100 feet above the top of the open-hole interval.

- There are no production or disposal wells that penetrate the Devonian formation within the one-mile Area of Review of the surface location and the bottom-hole location for the Laguna Salada 13 well.

- Based on the records of the New Mexico Office of the State Engineer, there are 11 fresh water wells within one mile of the surface location of the Laguna Salada 13 well. Mesquite was able to obtain an analysis from well C-005000, which was included in the application.

- The use of a tapered string will decrease friction loss and provide increased disposal efficiency.

- The primary sources of produced water will be wells with production from the Bone Spring and the Wolfcamp formations.

- The analyses of produced water samples Mesquite provided showed the compatibility of the injection fluids with formation fluids in the proposed disposal interval.

- Mesquite selected the proposed location for the Laguna Salada 13 well because the proposed locations would be no closer than one mile from any other disposal wells that penetrate the Devonian formation, which was the spacing requirement the Division had notified the public it was using at the time Mesquite filed its application.

- For the Laguna Salada 19 well:

    - Mesquite proposed a commercial operation with a maximum daily injection rate of 40,000 barrels of water per day (BWPD) using a maximum surface injection pressure of 2,900 pounds per square inch (psi). Mesquite proposes an average anticipated daily injection rate of 30,000 BWPD. Mesquite is willing to, as a condition of this Order, reduce the maximum daily rate by 5,000 barrels, to 35,000 BWPD maximum daily injection rate.

    - Mesquite seeks to drill the Laguna Salada 19 to an approximate total depth of 15,700 feet below surface. The injection will occur through an open borehole from approximately 14,500 feet to approximately 15,700 feet below surface.

    - The Laguna Salada 19 will be constructed with the following four casing strings and liner system: 20-inch surface casing set at 350' feet; 13 3/8-inch intermediate casing set at 2650 feet; 9 5/8--inch intermediate casing set at 9900 feet; and a 7 5/8-inch liner (with a weight of 39 pounds per foot) set from 9400 feet to a total depth of 14500 feet.

    - All three casings will have cement circulated to the surface while the liner will have cement circulated to the top of the liner.

    - The Laguna Salada 19 will inject fluids through a tapered tubing set consisting of plastic-lined, $5^{1}/_{2}$-inch outside diameter (OD) tubing within the liner and fiberglass-lined, 7-inch OD tubing above the liner. The tubing is attached to a packer set no shallower than 100 feet above the top of the open-hole interval.

    - There are no production or disposal wells that penetrate the Devonian formation within the one-mile Area of Review of the surface location and the bottom-hole location for the Laguna Salada 19 well.

    - Based on the records of the New Mexico Office of the State Engineer, there are 3 fresh water wells within one mile of the surface location of the Laguna Salada 19 well. Mesquite was able to obtain an analysis from well C-005000, which was included in the application, although that well is not in the area of review.

    - The use of a tapered string will decrease friction loss and provide increased disposal efficiency.

    - The primary sources of produced water will be wells with production from the Bone Spring and the Wolfcamp formations.

- The analyses of produced water samples Mesquite provided showed the compatibility of the injection fluids with formation fluids in the proposed disposal interval.

- Mesquite selected the proposed location for the Laguna Salada 19 well because the proposed locations would be no closer than one mile from any other disposal wells that penetrate the Devonian formation, which was the spacing requirement the Division had notified the public it was using at the time Mesquite filed its application.

(f) Mesquite showed through expert testimony that the injection zone is located within a reservoir with significant thickness which has significant primary and secondary porosity and permeability.

- Dr. Kate Zeigler testified on Mesquite's behalf and prepared a geologic study in support of her testimony based on location specific information. *See* Tab 2-A Exhibits.

- Dr. Zeigler's expert testimony established:

  - The target injection interval ("Injection Interval") for the Subject Wells is comprised of the Wristen Group and Fusselman formations. Each of these sub-formations or zones are located within what is commonly referred to by operators and the Division as the "Devonian" and "Devonian Silurian" formations. These zones consist of a very thick sequence of limestone and dolostone which has significant primary and secondary porosity and permeability. Trans. Vol. 1 at 92-93.

  - The Injection Interval for the Subject Wells is approximately 1,100 feet thick. Trans. Vol. 1 at 98.

  - The Injection Interval is bounded on the top and bottom by layers that act as permeability barriers. Trans. Vol. 1 at 92-93.

  - The Woodford Shale is the upper permeability barrier. It is an Upper Devonian unit which has low porosity and permeability. It is almost entirely shale and shales have low permeability. Given the thickness of the shale, it acts to restrict both upward and downward mobility of fluids. Trans. Vol. 1 at 94, lines 3-8.

- The Woodford Shale formation in the areas where the Subject Wells are proposed to be located is approximately 100 to 200 feet thick. Trans. Vol. 1, page 93, 98.

- Directly below the Injection Zone is the Montoya. The Montoya in the areas where the Subject Wells are proposed to be located is approximately 300 feet thick. Trans. Vol. 1, page 97. The

- The Montoya is a tight unit that will act as an additional lower permeability barrier. Trans. Vol. 1 at 116, lines 3-12.

- Below the Montoya is the Simpson Group which is greater than 50% shale and acts as a permeability boundary which prevents fluids from migrating downwards into deeper formations and the basement rock. Trans. Vol. 1 at 94, 20-24. In the area where the Subject Wells are proposed to be located, the Simpson Group is around 250 to 300 feet thick. Trans. Vol. 1 at 94, 97.

- Below the Simpson Group is the Ellenburger Formation, which is around 700 feet thick in the area of the Subject Wells. Trans. Vol. 1 at 97, lines 1-3.

- Dr. Ziegler concluded, based on her study, that there is a reasonably thick upper and lower permeability barrier above and below the Injection Interval that will prevent the migration of fluid from the proposed Injection Interval. She also concluded that there does not appear to be any evidence of faulting or pinch outs that would affect either the lower or upper permeability barrier. Trans. Vol. 1, at 103, lines 23-25, *id.* at 104, lines 1-4.

(g) Mesquite established through expert testimony that the Subject Wells will not impact underground sources of drinking water.

- Dr. Zeigler testified that, in her expert opinion, drilling and operation of the Subject Wells would not impact freshwater resources. Trans. Vol. 1 at 105.

- There is no risk to freshwater resources based on injection into the Siluro-Devonian because of the vertical offset between the injection zone and the shallow depth of USDWs, as well as the shale permeability barrier. Trans. Vol. 1 at 128, lines 9-25; *id.* at 129, lines 1-5.

(h) Mesquite established through expert testimony that the Subject Wells will not impact correlative rights.

- Dr. Zeigler testified that, in her expert opinion, drilling and operation of the Subject Wells would not impact correlative rights. Trans. Vol. 1 at 105.

- There are no currently recognized production shales within the Wristen Group, Fusselman, and Upper Montoya Group. While there may be some isolated traps located within these sub-formations, it takes significant ability with imaging to be able to locate these deposits in order to properly target them; and no operators appeared at the hearing indicating that correlative rights would be impacted by the wells. Trans. Vol. 1 at 104, lines 18-23.

(i) Mesquite showed through expert testimony that the Subject Wells will not result in induced seismicity.

- Mesquite's expert, Mr. Scott Wilson, testified that wellhead pressures are set at a maximum that is below the formation fracture pressure and, as a result, it is impossible to get above the formation fracture pressure. Consequently, Mesquite showed that it is highly unlikely that approving the Subject Wells would result in fractures to the formation. or confining shale barriers. Trans. Vol. 1 at 213, lines 6-13.

- Dr. Zeigler testified that her studies did not identify any evidence of significant fault offsets in the area of the wells. Trans. Vol. 1 at 99.

- Dr. Zeigler testified that the closest faults to the Subject Wells would be 10 to 15 miles. Trans. Vol. 1 at 99.

- Mr. Todd Reynolds, an expert geologist and geophysicist, prepared and reviewed several studies as part of his testimony. *See* Tab 3-A Exhibits.

    - Mr. Reynolds found no mapped faults in his review area, which was a 100 square mile area. Trans. Vol. 1 at 135, lines 8-14; *id*. at 137, lines 17-23; Trans. Vol. 2 at 231, lines 6-9; *id*. at 233, lines 15-25.

    - Mr. Reynolds prepared site specific cross-sections for the locations of the Subject Wells to confirm whether there is faulting in the area. Trans. Vol. 1 at 132, lines 19-25; *id.* at 133, lines 1-8. His cross sections were based

on 50 data points. Trans. Vol. 2 at 244, lines 16-18. He found no evidence of faulting in the area.

- Mr. Reynolds found no historical earthquake events within the 100 square mile review area. *See* Exhibits page 137.

- Mr. Reynolds prepared a fault slip potential analysis using the Stanford University Fault Slip Potential ("FSP") analysis tool. *See* Exhibits pages 134-138.

- For the Subject Wells' FSP, Mr. Reynolds included approximately 25 wells in the model. [See Exhibit page 136.] For wells in operation, Mr. Reynolds used the last reported injection rate. For proposed wells, Mr. Reynolds used 30,000 BWPD or 40,000 BWPD. Trans. Vol. 1 at 156-157; *see also* Exhibit page 135.

- Because there are no mapped faults within the 100 square mile review area, Mr. Reynolds concluded that there is no chance of fault slip caused by the Subject Wells. Trans. Vol. 2 at 234, lines 11-17; *see also* Exhibits page 145.

- He ran the model again using hypothetical faults and found no chance of slip. Trans. Vol. 1 at 137, lines 11-23; Exhibits pages 146-148.

- Mr. Reynolds concluded that the area where the Subject Wells are proposed "presents a low risk for induced seismicity related to SWD injection." *See* Exhibits page 137.

- Mr. Reynolds concluded: "At this time there is no evidence to support rate reduction for any of the existing or proposed wells." Exhibits page 137.

- Dr. Steven Taylor, one of Mesquite's expert seismology witnesses, presented site specific seismic monitoring data in areas near where the Subject Wells are proposed to be located. This seismic data, along with data compiled from other sources, including USGS, shows there has not been significant seismic activity, *i.e.*, no events greater than magnitude 2.0, within the areas where the wells are proposed to be located. *See* Exhibit pages 125, 130.

(j) Mesquite showed through expert testimony that operation of the Subject Wells will result in very little increase in pore pressure and will not create fracturing.

- Mesquite's reservoir engineer, Mr. Scott Wilson, prepared a reservoir engineering analysis. *See* Tab 4 Exhibits.

- Mr. Wilson included the Subject Wells as well as close offsets in his study. *See* Exhibits page 176.

- He modeled the wells at a constant injection rate of 40,000 BWPD, which is a conservative approach. Trans. Vol. 1 at 204, lines 4-8.

- Mr. Wilson's expert testimony established:

    - Because of the thickness and composition of the Injection Interval, there would be very small increases in pore pressure over a 20-year period even at the rate of 40,000 BWPD. Trans. Vol. 1 at 194-195.

    - He testified that at twenty years the Subject Wells begin to "slightly interfere with each other." Trans. Vol. 1 at 205, lines 21-23.

    - Assuming the maximum proposed injection rates (which is a conservative approach), for the Subject Wells, the area of influence around each of the wells extends a mile after 20 years depending on the thickness of the Injection Interval. Trans. Vol. 1 at 194, lines 17-25.

    - He testified that he "would not see any problems with" the Subject Wells, because, in general, it would not affect a well near it for 20 years or even longer. Trans. Vol. 1 at 216, lines 1-7.

- Mr. Wilson further testified that the interference is a reduction in injection volumes, or an operational interference, not a structural or geologic interference. Trans. Vol. 1 at 206-207. The impact is slight, at the end of twenty years a well could lose 3000 BWPD capacity out of the projected 40000. *Id.*; *see also* Exhibits page 183.

- He testified that he did not see any issues with fracturing, even with all wells in model injection 40000 BWPD for 20 years. Trans. Vol. 1 at 231, lines 6-21.

(k) Mesquite's experts testified that there is no geologic basis for a 1.5-mile spacing requirement generally and that no such spacing requirement was appropriate in this particular circumstance.

- Mesquite's expert, Mr. Reynolds, testified that a proper screening tool would be based on geology, not simply an arbitrary surface well to well distance screening tool. Trans. Vol. 2 at 217, line 1-8.

- Mesquite's expert, Mr. Reynolds, testified that a 1.5-mile screening tool does not protect against induced seismicity if wells are located too close to faults of concern, *i.e.*, faults optimally suited for slip. Trans. Vol. 2 at 240-241; *see also* Mesquite Rebuttal Exhibits.

- Mesquite's expert, Mr., Wilson, testified that a 1.5-mile spacing requirement only minimally reduces operational interference as compared to a 1-mile spacing requirement. Trans. Vol. 1 at 231, lines 6-15.

(l) Mesquite agreed to the following conditions of approval:

- Installing a seismic monitoring system. Trans. Vol. 1 at 85, lines 7-13.

- Willing to and has been following the Division's 1.5-mile spacing requirement for all of its wells proposed after the Division gave notice of this new requirement.

- Willing to reduce its injection volume to a maximum of 35,000 BWPD.

(15) The Division appeared at the hearing through counsel and presented one witness, Mr. Phillip Goetze.

(a) Mr. Goetze was admitted as an expert in geology and geohydrology and not seismology.

(b) **Mr. Goetze acknowledged that he had not prepared any site-specific analysis or studies either at the time he recommended denial of Mesquite's application or in advance of or during the hearing.** Trans. Vol. 2 at 87, lines 13-22.

(c) Mr. Goetze agreed that the Subject Wells will not impact Underground Sources of Drinking Water (USDWs).

- Mr. Goetze confirmed that EPA "is unaware of any underground source of drinking water contamination resulting from seismic events related to injection-induced seismicity." Trans. Vol. 2 at 31, lines 10-13. He testified that he agreed with this statement. Trans. Vol. 2 at 163, lines 6-10.

- Mr. Goetze acknowledged that he did not identify a freshwater supply that would be impacted or potentially impacted by the Subject Wells, either at the time of the denial or at the hearing. Trans. Vol. 2 at 145, lines 19-24.

- Mr. Goetze admitted that OCD does not have an issue with whether the Subject Wells would impact freshwater resources based on well construction. Trans. Vol. 2 at 149 at 20-23.

- He testified that he agreed that there is no risk to freshwater resources. Trans. Vol. 2 at 163, line 5.

(d) **Mr. Goetze agreed that the Subject Wells will not impact on correlative rights.**

- Mr. Goetze testified that Mesquite's application was adequate with respect to protecting correlative rights. Trans. Vol. 2 at 147.

(e) Mr. Goetze's testimony did not refute Mesquite's testimony establishing that the Subject Wells will not result in induced seismicity.

- Mr. Goetze acknowledged that the Division did not prepare any site specific induced seismicity analyses or studies at the time the Division denied the administrative applications or for the hearing. *See, e.g.*, Trans. Vol. 2 at 117-120; *id.* at 125-126 (Mr. Goetze testifying that he reviewed the testimony of Mesquite's witnesses but he has "offered nothing," including nothing site or location specific).

- Mr. Goetze testified that one of the sources he cited stated that "disposal of wastewater by injection into UIC Class II wells more often than not *results in no detectable seismic response*." Trans. Vol. 2 at 40, lines 3-10 (emphasis added).

- Mr. Goetze presented studies and testimony regarding induced seismicity in Texas, Oklahoma, Colorado, and other areas of New Mexico, as well as general EPA studies. *See generally* OCD exhibits.

- Mr. Goetze testified that the sources upon which he relied recommended a case-by-case, site specific approach to analyze the potential for induced seismicity. *See, e.g.*, Trans. Vol. 2 at 125-126, 157, lines 17-25.

- Mr. Goetze testified that EPA and other studies had identified three conditions that must be present to induce seismicity: 1) a preexisting fault must be present; 2) the

fault must be oriented suitably to slip; and 3) the pore-pressure perturbation must be sufficient to overcome the frictional strength of the fault. Trans. Vol. 2 at 40, lines 22-25; *id.* at 41 lines 1-2; Trans. Vol. 2 at 117, lines 13-24; Trans. Vol. 2 at 42, lines 5-10 (Mr. Goetze testified that "'sufficient pressure buildup from disposal activities…a fault of concern…pathway allowing the increased pressure to communicate from the disposal well to the fault' are a prime outline and effort for any program to deal with induced seismicity should look at."); Trans. Vol. 2 at 45, lines 24-25 (Mr. Goetze testified that "it is thought that pore pressure perturbations have the potential to migrate toward critically stressed, permeable faults in the crystalline basement.").

- Mr. Goetze admitted that h e did not analyze whether there was a preexisting fault near the Subject Wells, whether the fault, if one exists, was oriented suitably to slip, or whether the pore pressure was sufficient to overcome the frictional strength of the fault before he recommended denial of the Subject Wells. Trans. Vol. 2 at 118-119; Trans. Vol. 2 at 125-126; *id.* at 125, lines 10-13 (noting that he had reviewed Mesquite's testimony but "I've offered nothing" site specific.).

- Mr. Goetze did not dispute Mesquite's testimony that there was no fault of concern in the area of the Subject Wells. Trans. Vol. 2 at 118, lines 13-24.

- Mr. Goetze testified that the Stanford Fault Slip Potential analysis is a reliable tool that the Division has accepted. Trans. Vol. 2 at 148, lines 18-19.

- Mr. Goetze acknowledged that Mr. Reynolds "provides a good demonstration of information using the fault slip model. He provided an accurate depiction of what we asked for, as well as the information currently being required on many applications." Trans. Vol. 2 at 149, lines 3-7.

- Mr. Goetze did not refute Mr. Reynolds' testimony regarding induced seismicity nor did Mr. Goetze offer any contrary, site specific testimony.

- Mr. Goetz did not refute Mr. Wilson's or Dr. Ziegler's testimony, nor did Mr. Goetze offer any contrary, site specific testimony.

- In fact, Mr. Goetze testified that Mesquite's experts "provide[d] an evaluation which addresses many of the concerns." Trans. Vol. 2 at 194, lines 8-15.

- Mr. Goetze acknowledged that there was no evidence of seismic events near the Subject Wells. Trans. Vol. 2 at 140, lines 1-6.

- Mr. Goetze raised concerns with respect to induced seismicity and the Waste Isolation Pilot Project (WIPP), but did not present any evidence or testimony demonstrating or tending to demonstrate that operation of the Subject Wells would impact WIPP. *See, e.g.*, Trans. Vol. 2 at 45, lines 1-2, *id.* at 77, lines 17-18.

- Mr. Goetze testified that the Subject Wells are approximately 13 miles from the WIPP perimeter. Trans. Vol. 2 at 141, lines 3-4.

(f) Mr. Goetze's testimony did not refute Mesquite's testimony establishing that the 1.5-mile spacing requirement was not appropriate for the Subject Wells.

- The OCD recognizes, as stated by its legal counsel, that "Since the 1.5 mile distance is not a rule provision, it does not control unless the propriety of its application in a particular case is shown." Further, to warrant application of a spacing requirement, including the 1.5-mile requirement, a party opposing an application must "demonstrate by technical evidence that both wells now proposed cannot be operated consistently with environmental protection." Exhibit E.

- Mr. Goetze, the OCD's only witness, did not offer any evidence or testimony showing that the 1.5-mile screening tool was appropriately applied to the Subject Wells.

- Mr. Goetze only testified generally as to the Division's decision to impose the 1.5-mile screening tool, not whether the facts and circumstances of these particular cases warranted a 1.5-mile separation between wells to protect the environment.

(g) Mr. Goetze's testimony established that the 1.5-mile screening tool was not in place when Mesquite submitted its applications and that OCD has not uniformly applied the 1.5-mile screening tool.

- Mr. Goetze testified that as of June 2018 the Division had not imposed or decided upon the 1.5-mile screening tool. Trans. Vol. 2 at 152.

- In fact, Mr. Goetze testified that in June 2018, the Division approved a SWD permit for a well that was closer than 1.5 miles to a Mesquite well. Trans. Vol. 2 at 111, lines 19-21.

- Mr. Goetze testified that the 1.5-mile screening tool was decided upon in December 2018. Trans. Vol. 2 at 155, lines 4-17.

- Mr. Goetze testified that the 1.5-mile screening tool had never been made publicly available. He testified it was "offered individually" to applicants, apparently at the time the application was denied. Trans. Vol. 2 at 116, lines 6-11.

- Mr. Goetze testified that there was "no notice to operators" that OCD was imposing a 1.5 spacing requirement. Trans. Vol. 2 at 130, line 19.

- He further testified that the only way an operator would know about the requirement was through "individual contacts and discussion with [OCD]." Trans. Vol. 2 at 131, lines 23-24.

- Mr. Goetze admitted that the Division does not uniformly apply the 1.5-mile screening tool. Trans. Vol. 2 at 128 (Division decided to apply the rule "quasi-uniformly and temporarily").

- Mr. Goetze admitted that the Division has not opposed wells proposed to be closer than 1.5 miles from other wells, even after December 2018, and that the Division considers approving wells closer than 1.5 miles on a case-by-case basis. Trans. Vol. 2 at 111, lines 9-21; page 186, lines 1-6; Vol. 2 at 210, lines 6-25.

- Mr. Goetze testified that he "would take a different approach." Trans. Vol. 2 at 129, lines 13-15.

- Mr. Goetze testified that, in his opinion, OCD "should be doing a rulemaking" on the spacing requirement. Trans. Vol. 2 at 171, lines 4-9.

- Mr. Goetze testified that the Division used the 1.5-mile screening tool "based on the pressures of work" and as a screening tool to determine whether an application "could be administratively approved or not." Trans. Vol. 2 at 120-121.

- Mr. Goetze testified that he now agrees that a regulatory program would be most effective if it is site specific and depending upon a risk assessment, rather than fixed for all circumstances. Trans. Vol. 2 at 157, lines 17-25.

(h) Although raising questions about the viability of the lower confining layers, Mr. Goetze testified that he still supports using the Siluro-Devonian formation for injection. Trans. Vol. 2 at 151, lines 10-15.

The Division concludes as follows:

(1) The applications for the Subject Wells have been duly filed under the provisions of Division Rule 19.15.26.8 NMAC.

(2) Mesquite has presented satisfactory evidence that all requirements prescribed in Division Rule 19.15.26.8 NMAC have been met.

(3) Division records indicate Mesquite SWD, LLC is, as of the date of this order, in compliance with Division Rule 19.15.5.9 NMAC.

(4) 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.

(5) The Division supports the use of Devonian and Silurian formations as suitable disposal intervals to lessen the potential impact upon production of hydrocarbon resources and associated correlative rights that occur in shallower Permian formations. The Division recognizes the necessity to increase the efficiency of these deeper disposal wells with their increased cost associated with the deeper disposal interval.

(6) Mesquite's applications for the Subject Wells were filed before the Division determined to use the 1.5-mile screening tool and the 1.5-mile screening tool should not have been applied to the applications. Instead, the applications should have been granted administratively.

(7) Because the 1.5-mile spacing requirement is not a rule, it does not control these cases unless the propriety of its application has been demonstrated by technical evidence in this particular case. Mesquite's expert testimony in these cases demonstrated that application of the 1.5-mile screening tool is inappropriate under the circumstances because Mesquite's experts demonstrated by technical evidence, which the Division did not refute, that the Subject Wells could be operated consistently with environmental protection.

(8) The evidence presented in this case indicated that the approved injection zone for the Subject Wells is below the base of the Woodford Shale and above the Simpson Group formation, which consists of significant shale deposits. Evidence indicates that the shale formations located above and below the approved injection zone will likely restrict fluids from migrating above or below the injection zones.

(9) Mesquite presented sufficient evidence and testimony to demonstrate that operation of the Subject Wells will not impact USDW or freshwater resources due to the well construction and the permeability barriers and vertical offset distance between the injection interval and the water bearing zones.

(10) Mesquite presented sufficient evidence and testimony to demonstrate that operation of the Subject Wells will not impact correlative rights due to the lack of hydrocarbons in the

injection interval, the well design, and the permeability barriers and vertical offset distance between the injection interval and the hydrocarbon bearing zones

(11) Mesquite's expert testimony established that there are no faults of concern in the area of the Subject Wells, much less faults of concern that are optimally oriented to slip. The Precambrian basement faults are 10 to 20 miles away from the proposed locations and are not optimally oriented for slip.

(12) Mesquite's expert testimony established that there have been no historical or contemporary significant earthquake events within the 100 square mile review area.

(13) Mesquite presented sufficient evidence and testimony to demonstrate that operation of the Subject Wells is unlikely to create fault slip or induced seismicity, which the Division did not refute.

(14) Mesquite presented sufficient evidence and testimony to demonstrate that operation of the Subject Wells is unlikely to create induced seismicity, which in turn means that operation of the Subject Wells will not impact WIPP, which the Division did not refute.

(15) Mesquite presented evidence demonstrating that fishing operations could be successfully performed on the Subject Wells.

(16) There are no wells that penetrate the proposed injection interval within the one-mile AOR for the Subject Wells.

(17) To avoid the drilling of additional disposal wells, protect correlative rights, and prevent waste while affording Mesquite the opportunity to fully utilize the disposal potential of the Subject Wells in a manner that safeguards the public health and the environment, this application should be approved.

IT IS THEREFORE ORDERED THAT:

(1) Mesquite SWD, Inc. (the "Operator" or "Mesquite") is hereby authorized to utilize its Laguna Salada 13 SWD #1 (API No. 30-025-___Pending; the 'Laguna Salada 13") with a surface location 685 feet from the South line and 50 feet from the East line (Unit P) of Section 13, Township 23 South, Range 28 East, NMPM, Eddy County, New Mexico as a commercial disposal well for UIC Class II fluids. Disposal shall be through open hole in the Devonian and Silurian formations (below the lower contact of the Woodford Shale) from **14500 feet** to approximately **15700 feet** below surface (the "permitted disposal interval"). Injection is to be through a plastic-lined, tapered tubing set and a packer placed within 100 feet above the top of the permitted interval. This order shall approve the use of a tapered tubing set consisting of $5^1/_2$-inch (OD) or smaller tubing placed within the 7 5/8-inch liner (with a weight of 39 pounds per foot) and 7-inch (OD) or smaller tubing placed in the 9 5/8-inch intermediate casing above the 7 5/8-inch liner.

(2) Mesquite SWD, Inc. (the "Operator" or "Mesquite") is hereby authorized to utilize its Laguna Salada 19 SWD #1 (API No. 30-025___Pending; the 'Laguna Salada 19") with a surface location 1752 feet from the South line and 1727 feet from the East line (Unit J) of Section 19, Township 23 South, Range 29 East, NMPM, Eddy County, New Mexico as a commercial disposal well for UIC Class II fluids. Disposal shall be through open hole in the Devonian and Silurian formations (below the lower contact of the Woodford Shale) from **14500 feet** to approximately **15700 feet** below surface (the "permitted disposal interval"). Injection is to be through a plastic-lined, tapered tubing set and a packer placed within 100 feet above the top of the permitted interval. This order shall approve the use of a tapered tubing set consisting of $5^1/_2$-inch (OD) or smaller tubing placed within the 7 5/8-inch liner (with a weight of 39 pounds per foot) and 7-inch (OD) or smaller tubing placed in the 9 5/8-inch intermediate casing above the 7 5/8-inch liner.

(3) The Operator shall take all steps necessary to ensure that the disposed water enters only the permitted disposal interval and is not permitted to escape to other formations or onto the surface. This order does not allow disposal into formations below the Silurian formations including the Montoya formation and the Ellenburger formation (lower Ordovician) or lost circulation intervals directly on top and obviously connected to these formations.

(4) The Operator shall complete a mudlog over the permitted disposal interval sufficient to demonstrate the hydrocarbon potential. The Operator shall notify the Division's District II office and the Santa Fe engineering bureau office of significant hydrocarbon shows that are observed during drilling of the permitted disposal interval. The Operator shall provide the District office with copies of the log.

(5) Prior to commencing disposal, the Operator shall submit mudlog and geophysical logs information to the Division's District II geologist and Santa Fe engineering bureau office, showing evidence agreeable that only the permitted formation is open for disposal including a summary of depths (picks) for contacts of the formations which the Division shall use to amend this order for a final description of the depth for the injection interval.

(6) Prior to commencing disposal, the Operator shall obtain a bottom-hole pressure measurement representative of the injection interval and submit this data with the information required in Ordering Paragraph (__).

(7) As provided in the C-108s, the Operator shall circulate to surface the cement for all casings and to the top of liner for the 7 5/8-inch liner. The tie-in of the 7 5/8-inch liner with the 9 5/8-inch casing shall be equal to or greater than 200 feet. The Operator shall run a cement bond log ("CBL" or equivalent) across the 7 5/8-inch liner from 500 feet above the liner to the bottom of the liner to demonstrate placement cement across the length of the liner and the cement bond with the tie-in with the 9 5/8-inch casing. Copies of the CBL shall be provided to the Division's District II office.

(8) After installation of tubing, the casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge or an approved leak detection device in order to determine

leakage in the casing, tubing, or packer. The casing shall be pressure tested from the surface to the packer setting depth to assure casing integrity.

(9) The well shall pass an initial mechanical integrity test ("MIT") prior to commencement of disposal and prior to resumption of disposal each time the disposal packer is unseated. All MIT procedures and schedules shall follow the requirements in Division Rule 19.15.26.11(A) NMAC.

(10) The wellhead injection pressure for the Laguna Salada 13 shall be limited to no more than 2900 psi.

(11) The wellhead injection pressure for the Laguna Salada 19 shall be limited to no more than 2900 psi.

(12) In addition, the Subject Wells shall be equipped with a pressure limiting device in workable condition which shall, at all times, limit surface tubing pressure to the maximum allowable pressure for this well.

(11) The Director of the Division may authorize an increase in tubing pressure upon a proper showing by the Operator of said well that such higher pressure will not result in migration of the disposed fluid from the approved injection interval. Such proper showing shall be demonstrated by sufficient evidence including but not limited to an acceptable Step-Rate Test.

(12) Further, the Subject Wells shall be limited to a maximum injection rate of no more than 35,000 barrels of water per day.

(13) Mesquite agrees to install seismic monitors or conduct seismic monitoring with respect to the Subject Wells.

(14) The Director of the Division may authorize an increase in the injection rate upon a proper showing by the Operator of said well that such increase in injection rate will not result in migration of the disposed fluid from the approved injection interval. Such proper showing shall be demonstrated by sufficient 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.

(15) The Operator shall notify the supervisor of the Division's District II office of the date and time of the installation of disposal equipment and of any MIT test so that the same may be inspected and witnessed. The Operator shall provide written notice of the date of commencement of disposal to the Division's District II office. The Operator shall submit monthly reports of the disposal 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.

(16) Without limitation on the duties of the Operator as provided in Division Rules 19.15.29 and 19.15.30 NMAC, 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.

(17) If a Subject Well fails a MIT or if there is evidence that the mechanical integrity of said well is impacting correlative rights, the public health, any underground sources of fresh water, or the environment, the Division Director shall require the well to be shut-in within 24 hours of discovery and the operator shall redirect all disposal waters to another facility. The operator shall take the necessary actions to address the impacts resulting from the mechanical integrity issues in accordance with Division Rule 19.15.26.10 NMAC, and the well shall be tested pursuant to Rule 19.15.26.11 NMAC prior to returning to injection.

(18) The Division further stipulates the following "best management practices" shall be included as conditions of the approved application:

(a) The Subject 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 II 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 Subject Wells.

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

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

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

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

(22) One year after disposal into a Subject Well has ceased, said well will be considered abandoned and the authority to dispose will terminate *ipso facto*.

(23) 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.

(24) 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 prior to notice and hearing in event of an emergency, terminate the disposal authority granted herein.