

**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:**

**APPLICATION OF BLACKBUCK RESOURCES, LLC FOR APPROVAL OF A  
SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.**

**CASE NO. 20463**

**APPLICATION OF SOLARIS WATER MIDSTREAM, LLC FOR APPROVAL OF A  
SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.**

**CASE NO. 20465**

**ORDER OF THE DIVISION**

**BY THE DIVISION:**

These cases came on for hearing at 8:15 a.m. at Santa Fe, New Mexico, before Examiners William Jones and Michael McMillan on May 31, June 28, and July 21, 2019.

NOW, on this \_\_\_\_ day of \_\_\_\_\_, 2019 the Division Director, having considered the testimony, the record, and the recommendations of Examiner

**FINDS THAT:**

- (1) Due public notice has been given, and the Division has jurisdiction of this case and the subject matter.
- (2) Blackbuck Resources, LLC (“Applicant” or “Blackbuck”) (OGRID No. 373619) seeks authority to utilize its Olive Branch SWD Fed 1 (the “Subject well”), to be located 979 feet from the South line and 2,620 from the East line (Unit N) of Section 17, Township 24 South, Range 32 East, NMPM, Lea County, New Mexico, as an Underground Injection Control (UIC) Class II well for disposal of produced water into the Devonian-Silurian formations at depths between 16,825 through 18, 290 open hole.
- (3) The Subject Well will be constructed with the following four casing strings: 20-inch surface casing set at a depth of 955 feet to protect the USDWs and cemented to surface; 13-3/8-inch intermediate casing set at a depth of 4,680 feet into the top of the Delaware Mountain Group and cemented to the surface; 9-5/8-inch second intermediate casing set at a depth of 13,845 feet through the Bone Springs and Wolfcamp formations and cemented to

surface; and a 7-5/8-inch liner set at a depth of 16,825 feet through the Morrow Formation and cemented back at least 200 feet into the second intermediate casing (Blackbuck Ex. 1).

- (4) The Subject Well will inject fluids through internally plastic coated (IPC) injection tubing that will be 5-1/2-inch from 0 to 13,635 feet and then tapered down to 4-1/2-inch inside the 7-5/8-inch liner to a depth of 16,805 feet, which is approximately 20 feet above the top of the proposed Devonian-Silurian injection interval (Blackbuck Ex. 1).
- (5) Applicant proposes a closed system operation with an average injection rate of 15,000 barrels of water per day (Blackbuck Ex. 1).
- (6) The primary source for disposal operations in the Subject Well would be produced water from area oil and gas wells and the applicant has submitted copies of produced water analysis which is compatible with native brines within the Devonian-Silurian injection interval (Blackbuck Ex. 1).
- (7) No active, fresh-water wells were identified within a one-mile radius of the Subject Well; therefore, no water well samples were collected (Blackbuck Ex. 1).
- (8) Applicant identified 24 permitted or active oil and gas wells within the 1-mile Area of Review (AOR), but none of the wells penetrated the proposed injection interval (Blackbuck Ex. 1).
- (9) Applicant reviewed historical oil and gas production in this area, and there no hydrocarbon production from either the Devonian or Silurian formations within 3 miles of the Subject Well (Blackbuck Ex. 1).
- (10) Notice of the application was provided to all affected parties (Blackbuck Ex. 1).
- (11) Solaris Water Midstream , LLC (“Solaris”) seeks an order approving disposal of produced water at depths of 16965-18149 feet subsurface into the proposed Predator 17 SWD Well No. 1 (Predator 17 well), located 1465 feet from the north line and 1893 feet from the east line of Section 17, Township 24 South, Range 32 East, NMPM.
- (12) On March 22, 2019, Blackbuck submitted an administrative application (Application No. pMAM1908153552) to the Division for approval of the Subject well for commercial disposal of produced water. After submittal of the application, the Division received notifications of protests by NGL Water Solutions Permian, LLC and OXY USA Inc., therefore, the matter had to go to hearing.
- (13) On March 4, 2019, Solaris submitted an administrative application (Application No. pMAM1906359525) to the Division for approval of the Predator 17 well for commercial disposal of produced water. After submittal of the application, the Division received notifications of protests by OXY USA Inc., therefore, the matter had to go to hearing.

- (14) Solaris published an erroneous notice of its administrative application in the Hobbs News Sun newspaper listing the location of the Predator 17 well as being 1465 FNL and 1893 FWL instead of the correct 1465 FNL and 1893 FEL as shown in the C-108 filed by Solaris with the Division. Other inconsistencies in the Solaris C-108 administrative application process included the injection interval and packer depth, and omission of a well within the area of review.
- (15) On April 2, 2019, the Division received a request from both Blackbuck and Solaris to place their respective applications for the Subject well and the Predator 17 well on a hearing docket.
- (16) Thereafter, the application was opposed by:
- (a) NGL Water Solutions Permian, LLC;
  - (b) Solaris Water Midstream, LLC;
  - (c) the Oil Conservation Division of the Energy, Minerals, and Natural Resources Department;
  - (d) Mesquite SWD, Inc.
- (17) The Oil Conservation Division entered appearances and intervened in both of the captioned cases and the Mesquite SWD, Inc Cases Nos. 20472, 20313, and 20314, and the basis of its intervention was that the parties' respective wells were within a 1.5 miles between injection sources (based on a ¾-mile radius from the surface location of the respective wells).
- (18) The captioned cases were consolidated for hearing so that the Oil Conservation Division would not have to present evidence in each case since its opposition in each of the cases applied to each of the captioned cases. Also consolidated for hearing were the applications of Mesquite SWD, Inc in Cases Nos. 20472, 20313, and 20314.
- (19) NMAC 19.15.26.8 (B)(1) and (2) states:
- B. Method of making application.**
- (1) The operator shall apply for authority to construct and operate an injection well by submitting form C-108 complete with all attachments to the division.
  - (2) The applicant shall furnish, by certified or registered mail, a copy of the application to each owner of the land surface on which each injection or disposal well is to be located and to each leasehold operator and other affected persons, as defined in Subsection A of 19.15.2.7 NMAC, within any tract wholly or partially contained within one-half mile of the well. (emphasis added.)
- (20) The Division form C-108 requires an area of review (AOR) of one-half mile from a proposes SWD well consistent with NMAC 19.15.26.8 (B) (2).
- (21) The Division Exhibit 9-E, a SWD guideline for SWD wells, which calls for 1.5 miles between injection sources, was not adopted as a rule or regulation, nor was the Division's Form C-108 amended to include Exhibit 9-E, after notice and hearing. V2--168 TR 23-25, 169, 170 1-16.
- (22) Before the Division may adopt UIC rule and regulation changes and amendments notice and hearing are required. V2--172 TR 4-16.

- (23) Based on data provided by the Oil Conservation Division (OCD), the application for the Subject Well was received and determined to be administratively complete by OCD on March 22, 2019 (Blackbuck Ex.2).
- (24) Based on data provided by OCD, the application for Solaris's Predator Federal 17 SWD #1, which is located approximately 0.6 miles north-northeast was received and deemed to be administratively complete by OCD on April 2, 2019.
- (25) There are no active Devonian-Silurian Saltwater Disposal (SWD) wells located within 1.5 miles of the Subject Well's proposed surface hole location.
- (26) There are two (2) active Devonian-Silurian SWDs located within 1.5 miles of the surface hole location of Solaris's Predator Federal 17 SWD #1. The injection interval (Devonian-Silurian formations) is confined above by the Woodford Shale, which ranges from approximately 105 to 193 feet thick in this area with low porosity and permeability. The Woodford Shale serves as the upper confining zone barrier (Blackbuck Ex. 3 and Ex. 4).
- (27) The lower confining zones are the Montoya Formation and Simpson Group, which consist of shales, cherts, and carbonate rocks of low porosity and low permeability zones that will act as barrier to fluid migration downward below the permitted injection interval (Blackbuck Ex. 1 and Ex. 3).
- (28) Blackbuck's expert testified that review of Devonian-Silurian geophysical logs show that the lower section of carbonate rocks within the Lower Silurian Fusselman Formation are very tight with low porosity and low permeability and will further act as a lower confining zone.
- (29) Blackbuck's expert testified that based on geophysical log analysis in the area of the Subject Well, there is approximately 1,000 to 1,200 feet of rock between the top of the injection interval and the top of the Precambrian basement at the proposed SWD location that will serve as a lower confining zone.
- (30) The closest known fault to the Subject Well is located approximately 11 miles to the east (Blackbuck Ex. 7).
- (31) The closest recorded seismic event to the Subject Well is an M2.9 event located approximately nine miles to the northeast that occurred on December 4, 1984, (Blackbuck Ex. 7).
- (32) Blackbuck's expert performed a fault slip probability (FSP) analysis that showed no risk of fault slip in the area after 25 years under a worst case scenario (i.e. randomly generated faults and low geologic conditions). The FSP models demonstrate that this area presents little to no risk for injection induced seismicity (Blackbuck Ex. 9).

- (33) Blackbuck's expert conducted a volumetric fill-up analysis demonstrating that the operation of the Subject Well will result in minimal injection interference over 30 years (Blackbuck Ex. 5).
- (34) Blackbuck's expert volumetric fill-up analysis demonstrated that under average injection rates, Solaris's Predator Federal 17 SWD #1 would interfere with the volumetric fill-up of nearby Devonian-Silurian SWDs in 20-25 years, whereas the Subject Well's volumetric fill-up would not interfere with the volumetric fill-up of nearby active Devonian-Silurian SWDs for more than 30 years (Blackbuck Ex. 5).
- (35) Blackbuck's experts further testified to the use of multiple tools including seismic monitoring and mitigation, annual pressure testing, radioactivity tracer and spinner surveys, and continuous monitoring of injection rates and pressures to alleviate the risks of injection induced seismicity and proposes to implement such testing and monitoring as a part of the operation of the Subject Well.
- (36) **The Division appeared at the hearings through counsel and presented the following evidence and testimony.**
- (37) The Division testified that the probability of oil and gas being present in the Devonian-Silurian formations in the area of the Subject Well is low.
- (38) The Division testified that there is little data to confirm that the Montoya-Simpson rocks underlying the injection interval will act as a barrier to downward migration of injected fluids throughout the Delaware Basin.
- (39) The Division testified that it is difficult to know whether faults are present within a certain area.
- (40) The Division testified that a 1.5 mile setback for Devonian-Silurian SWDs is being used as a guidance and is based on U.S. EPA's Class II Induced Seismicity report, as opposed to being based on site-specific investigation and data. The EPA report, however, lists a number of different operational approaches a regulatory agency can take to address the potential for injection induced seismicity.
- (41) On cross-examination the Division's expert witness testified that a proper analysis for reservoir characteristics for determination of well spacing for salt water disposal into the Devonian Formation should be site specific. V2—172 TR 17-15, 173, 174 1-16.
- (42) **Solaris appeared at the hearings through counsel and made a geological presentation consistent with geological presentations made by Blackbuck and Mesquite.**
- (43) **Mesquite appeared at the hearings through counsel but did not present evidence against the Blackbuck case.**

**IT IS THEREFORE ORDERED THAT:**

- A. The Division’s application of a policy adopted under its Exhibit 9-E, without appropriate rule changes and amendments after notice and hearing, is arbitrary and capricious and an abuse of discretion contrary to law.
- B. Blackbuck Resources LLC (“Blackbuck” or “operator”) is hereby authorized to utilize the Olive Branch SWD Fed #1 (API No. 30-025-XXXXX; the “Subject Well”), located 979 feet from the South line and 2,620 feet from the West line (Unit N) of Section 17, Township 24 South, Range 32 East, NMPM , Lea County, New Mexico, for disposal of oil field produced water (UIC Class II only) into the Devonian and Silurian formations through an open-hole interval from 16825 to 18290 feet. Disposal shall occur through 5.5x4.5 inch internally-coated tubing and a packer set no more than 100 feet above the permitted disposal interval.
- C. This permit does not allow disposal into formation 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.
- D. Within two years of the approval date of this order, the operator shall conduct an injection survey, consisting of a temperature log or equivalent, over the entire injection interval using representative disposal rates. Copies of the survey results shall be provided to the Divisions’ District II office and Santa Fe Engineering Bureau office.
- E. 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.

**IT IS FURTHER ORDERED THAT:**

(HIGHLIGHTED PARAGRAPHS F-J CONSTITUTE CONDITIONS FOR APPROVAL)

- F. Prior to commencing disposal, the Operator shall submit mudlog and geophysical log information, to the Division’s District 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. Specifically, open-hole logging shall include a gamma ray, compensated density-neutron, caliper, and resistivity log, run across the open-hole of the Devonian-Silurian injection interval.
- G. Prior to commencing disposal, the Operator shall run an initial spinner survey and radioactive tracer survey to profile injection fluids into the injection interval and confirm that injected fluids are not traveling through the lower confining interval.
- H. The Operator shall install a Supervisory Control and Data Acquisition (SCADA) system to continuously monitor injection and annulus pressures and injection rate.
- I. The Operator shall install a seismic monitor and accelerometer at the well-site to detect seismicity. The seismic monitor system shall be compatible with existing seismic monitoring

systems operated by New Mexico Tech and the USGS. Seismic monitoring data will be sent directly to the Incorporated Research Institutions for Seismology system (IRIS), so the data will be compatible with and available to New Mexico Tech and the USGS. A mitigation and monitoring plan will be prepared and submitted to the Division outlining the mitigation, measures that will be taken, including reduction or cessation of injection, if seismic events of certain magnitudes are detected and attributed to injection of the Subject Well.

- J. The operator shall perform an annual 6-hour static shut-in pressure test and copies of the tests shall be provided to the Division's District II office and Santa Fe Engineering Bureau office.
- K. 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 to determine leakage in the case, tubing, or packer. The casing shall be pressure tested from the surface to the packer setting depth to assure casing integrity.
- L. The well shall pass a mechanical integrity test ("MIT") prior to initially commencing disposal and prior to resuming 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.
- M. The operator shall notify the supervisor of the Division's District office of the date and time of the installation of disposal equipment and of any MIT 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 office. The operator shall submit monthly reports of the disposal operations on Division Form C-115, in accordance with Division Rules 19.15.26.13 and 19.15.7.24 NMAC.
- N. The well head injection pressure shall be limited to no more than 3365 psi. The disposal well shall be equipped with a pressure limiting device in workable condition which shall always limit surface tubing pressure to the maximum allowable pressure for this well.
- O. 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 and not exceed the limitation in Ordering Paragraph (3). Such proper showing shall be demonstrated by sufficient evidence including but not limited to an acceptable Step-Rate Test.
- P. The operator shall notify the supervisor of the Division's Hobbs District 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 Hobbs District office. The operator shall submit monthly reports of the disposal operations on Division Form C-115, in accordance with Division Rules 19.15.26.13 NMAC and 19.15.7.24 NMAC.
- Q. Without limitation on the duties of the operator as provided in Rules 19.15.29 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.

- R. 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 or disposal well that will be transferred prior to approving transfer of authority to inject.
- S. The disposal authority granted herein shall terminate one (1) year after the effective date of this order if the operator has not commenced injection operations into the Subject Well. One year after the last date of reported disposal into this well, the Division shall consider the well abandoned, and the authority to dispose will terminate *ipso facto*. The Division, upon written request mailed by the operator prior to the termination date, may grant an extension thereof for good cause.
- T. 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.
- U. 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.

[ Signature Block ]