

**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. 14178
ORDER NO. R-13043**

**APPLICATION OF MESQUITE SWD, INC. FOR AUTHORIZATION TO
INJECT AND TO OBTAIN AN AMENDMENT TO PERMIT NO. SWD-180,
EDDY COUNTY, NEW MEXICO.**

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 9:00 a.m. on October 15, 2008, at Santa Fe, New Mexico, before Examiners Richard Ezeanyim, Terry Warnell, and David Brooks.

NOW, on this 7th day of November, 2008, 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 its subject matter.
- (2) On December 31, 1976, the Oil Conservation Commission issued Order No. SWD-180 which authorized the Exxon State Well No. 8 to inject produced water into the Yates formation from approximately 570 feet to 600 feet.
- (3) On February 18, 1977, the operator of the Exxon State Well No. 8 obtained approval for Application for Permit to Drill (APD) to deepen the well. The operator deepened the well from 600 feet to 694 feet and continued to inject produced water to 694 feet as if it had been approved for salt water disposal to this depth. Approval of an APD to deepen the well to 694 feet does not constitute approval to inject produced water to this depth.
- (4) The Division records indicate that injection of produced water into this well to 694 feet continued until October 1994. Injection of produced water into the well ceased from November 1994 to May 1997. The injection authority for this well

expired as a result of one year of non-injection activity into this well. However, the operator resumed injection of produced water into this well from June 1997 until May 2008.

(5) On May 9, 2008, the Division Director issued an Emergency Order No. E-37 shutting down the Exxon State Well No. 8 on the grounds that it has failed to confine injected fluids to the authorized injection zone in violation of Order No. SWD-180, and 19.15.9.703.A and B NMAC.

(6) The applicant, Mesquite SWD, Inc. ("Mesquite" or "applicant"), now seeks amendment of Order No. SWD-180 authorizing it to utilize its Exxon State Well No. 8 (API No. 30-015-22055) located in Unit O of Section 15, Township 21 South, Range 27 East, NMPM, Eddy County, New Mexico, to dispose of produced water into the Yates formation through open-hole interval from a depth of 570 feet to 694 feet.

(7) The Oil Conservation Division ("Division") appeared through legal counsel to oppose the application and presented the following testimony.

(a) The Exxon State Well No. 8 is injecting large volumes of produced water through open hole into the Yates formation at very low pressures. The injected water may not be confined to the injection interval, and it is not clear where the injected water is going.

(b) The current operator acquired the well on December 1, 2005, and since January 2006 to May 2008, approximately 4.4 million barrels of water have been injected into this well.

(c) The high permeability in the injection zone is probably attributable to the fact that the well is very close to the Capitan Reef Complex.

(d) From the log analysis in the wells in the general area, the top of the Capitan Reef appears to be between 700 feet to 900 feet. The total depth of the Exxon State Well No. 8 is 694 feet. At this depth, the well may be located at the top of the Capitan Reef.

(e) The well may be injecting produced water into the Capitan Reef, or the water may be moving to wells not properly plugged and abandoned in the area. Some of the wells in the area of review (AOR) were drilled in the 1950's and most of these wells may not have been properly plugged and abandoned.

(f) The Division is charged with protecting fresh water by the implementation of the Underground Injection Control (UIC) Program, under a primacy obtained from the United States Environmental Protection Agency (USEPA). The Division is concerned about protecting the fresh water upon which the city of Carlsbad and surrounding

communities depend. For the above reasons, the Division is opposed to granting the permit sought by Mesquite SWD, Inc. in this case.

(8) The applicant acquired the services of a Certified Professional Geologist who testified to the following.

(i) The Exxon State Well No. 8 at a total depth of 694 feet is injecting produced water into the Yates formation only, and not into the Capitan Reef Complex. From a rigorous assessment of the geological structures and stratigraphy in the general area, the base of the Yates formation is believed to be at a depth of 744 feet, and probably deeper in the Exxon State Well No. 8.

(ii) The New Mexico State Engineer well records indicate that no water wells are present within the two-mile radius of the Exxon State Well No. 8, and not even livestock watering wells are reported within this two-mile radius of the well. No known potable water aquifers were found within the two-mile radius of this well.

(iii) Thorough examination of available geologic, hydrogeologic, and engineering data found no evidence of open faults, or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

(iv) The Capitan Reef Complex consists of three main geologic structures, namely the Back Reef Facies, the Reef itself, and the Capitan Reef Aquifers. The vast majority of the beds in the Back Reef environment have very limited porosity and permeability. The Exxon State Well No. 8 is located in the Back Reef Facies environment, however, the well is not hydrologically connected to the Back Reef Facies of the Capitan Reef Complex.

(v) The total dissolved solids (TDS) concentration of the waters that will be injected into the Exxon State Well No. 8 is considerably less than the TDS concentration of the native waters in the formation receiving the disposal.

(vi) Barriers to the vertical movement of water from the disposal well are clearly demonstrated by the examination of the pay production from the four wells that surround the Exxon State Well No. 8. The pay zone is water driven. From a hydrogeochemical evaluation of produced water from the surrounding four wells and comparison to a detailed chemical analysis of typical waters disposed into the Exxon State Well No. 8, it is clear that no waters from the zone have moved upward as a result of the disposal.

(vii) The Exxon State Well No. 8 has been approved for salt water disposal for over thirty-one (31) years. During this time period, the quantity of water injected into the well has had no significant effect on the area of review wells, and no impact can be seen for the adjacent area for the foreseeable future.

(9) A Bureau of Land Management (BLM) geologist reviewed the report of the applicant's geologist regarding the assessment of the geological structure and stratigraphy, and the hydrogeological setting of the Mesquite Exxon State Well No. 8 salt water disposal, and agreed with its findings as discussed above. As a result, BLM does not object to the amendment of SWD-180, and granting of injection authority for the Exxon State Well No. 8. as requested by applicant.

(10) No other party appeared at the hearing to oppose the application.

(11) **The Division concludes the following.**

(a) The production interval in the Yates formation is from 540 feet to 560 feet which is shallower than the injection interval of 570 feet to 694 feet in the Exxon State Well No. 8. As a result, injecting produced water at low pressures into this interval will not cause waste.

(b) The construction of the Exxon State Well No. 8 is adequate to receive produced water under vacuum for disposal purposes in the Yates formation through the open-hole interval from 570 feet to 694 feet.

(c) There are twenty (20) wells within the area of review (AOR) of the injection well. Five (5) of these wells are active producing wells. Fifteen (15) of these wells are plugged and abandoned. A review of these fifteen wells indicates that four of the wells are not properly plugged and abandoned. Mesquite SWD, Inc. should plug and abandon the following four wells before commencing injection operations into the Exxon State Well No. 8.

Well Name	API No.	Location
Magnolia State # 3	30-015-01087	2310 FSL, 330 FEL Sec 15, T21S, R27E
Pure State #6	30-015-01099	330 FSL, 1650 FEL, Sec. 15, T21S, R27E
Exxon State	30-015-01092	1650 FSL, 2310 FEL, Sec. 15, T21S, R27E
Exxon State	30-015-01100	990 FSL, 2310 FEL, Sec. 15, T21S, R27E

(d) The total dissolved solids (TDS) concentration of the water to be disposed into the well is less than the TDS concentration of the native waters receiving the disposal.

(e) Evidence presented by both parties indicates that there is high porosity and permeability in the injection interval. However, the Exxon State Well No. 8 is not hydrologically connected to the Capitan Reef or any other underground sources of drinking water.

(12) This application should be approved.

IT IS THEREFORE ORDERED THAT:

(1) The application of Mesquite SWD, Inc. seeking amendment of Order No. SWD-180 authorizing it to utilize its Exxon State Well No. 8 (**API No. 30-015-22055**) located in Unit O of Section 15, Township 21 South, Range 27 East, NMPM, Eddy County, New Mexico, to dispose of produced water into the Yates formations through open-hole interval from a depth of 570 feet to 694 feet is hereby approved.

(2) The Division Order No. SWD-180 is hereby amended and placed in abeyance, and shall be superseded by this order.

(3) The injection of produced water into the Exxon State Well No. 8 shall be under vacuum, and shall be accomplished through a 2-7/8 inch plastic coated tubing set in a packer at 550 feet.

(4) The operator shall plug and abandon the following four wells before commencing injection operations into the Exxon State Well No. 8. **Evidence of completion of this work shall be sent to the Engineering Bureau in the Santa Fe office of the Division.**

Well Name	API No.	Location
Magnolia State # 3	30-015-01087	2310 FSL, 330 FEL Sec 15, T21S, R27E
Pure State #6	30-015-01099	330 FSL, 1650 FEL, Sec. 15, T21S, R27E
Exxon State	30-015-01092	1650 FSL, 2310 FEL, Sec. 15, T21S, R27E
Exxon State	30-015-01100	990 FSL, 2310 FEL, Sec. 15, T21S, R27E

(5) The operator shall take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations.

(6) In accordance with Rule No. 705.B, the operator shall provide written notice of the date of commencement of injection operations to the Artesia district office of the Division.

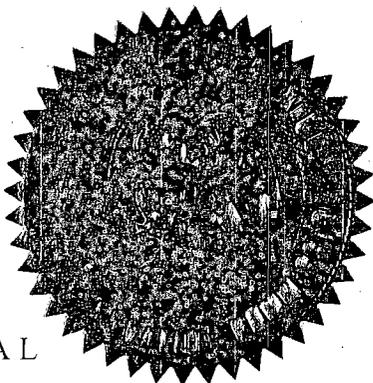
(7) In accordance with Rule No 705.C, the injection authority granted herein shall terminate one year after the effective date of this order if the operator has not commenced injection operations into the well, and will terminate *ipso facto*, one year after injection operations have ceased. The Division Director may grant an extension of time for commencement of injection operations if the request is made within the expiration of the time period.

(8) In accordance with Rule Nos. 706 and 1120, the operator shall submit monthly reports of the disposal operations on Division Form C-115.

(9) This order does not relieve the operator of responsibility should its operations cause any actual damage or threat of damage to protectable fresh water, human health, or the environment; nor does it relieve the operator of responsibility for complying with applicable Division rules or other state, federal, or local laws or regulations.

(10) 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 water or (2) consistent with the requirements in this order, whereupon the Division may, after notice and hearing, or without notice and hearing in the event of an emergency, subject to NMSA 1978, Section 70-2-25, terminate the injection authority granted herein.

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



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STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

A handwritten signature in black ink, appearing to read "Mark E. Fesmire". The signature is fluid and cursive, written over the printed name.

MARK E. FESMIRE, P.E.
Director