

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

**APPLICATION OF FAE II OPERATING, LLC
FOR RE-INSTATEMENT OF INJECTION
AUTHORITY AND AUTHORIZATION TO
CONVERT A DISPOSAL WELL TO AN INJECTOR
FOR WATERFLOOD OPERATIONS,
LEA COUNTY, NEW MEXICO.**

**CASE NO. 22134
ORDER NO. R-21956**

ORDER OF THE DIVISION

The Director of the New Mexico Oil Conservation Division (“OCD”), having heard this matter through Hearing Examiner Baylen Lamkin on September 9, 2021, and after considering the testimony, the evidence, and the recommendations of the Hearing Examiner, issues the following Order.

FINDINGS OF FACT

1. Due public notice has been given, and the OCD has jurisdiction of this case and of the subject matter.
2. FAE II Operating, LLC’s (“FAE” or “Applicant”) application seeks an order reinstating injection authority for four injection wells in its proposed Blackbeard South Waterflood Project and authorizing FAE to convert a produced water disposal well to an injector for waterflood operations.
3. On July 9, 1974, the OCD issued Order No. R-4819 in Case No. 5258, which established two waterfloods within the same project area, the Texas Pacific Oil Company Jalmat State A Waterflood Project and the Texas Pacific Oil Company Langlie Mattix State A Waterflood Project, with injection into the Seven Rivers and Queen formations. This order by the Commission also approved the commingling of production in the same wellbore for the Jalmat and Langlie Mattix pools.
4. On June 17, 1975, the OCD entered Order No. R-4819-A in Case No. 5489 to expand the project area into Sections 3 and 23 of Township 23 South, Range 36 East, NMPM with the approval of three additional injection wells.
5. On January 2, 1984, the OCD approved administrative order WFX-522 to expand injection with the following wells: the State A A/C 1 No. 117, the State A A/C 1 No. 120, the State A A/C 3 No. 10 and the State A A/C 3 No. 11. Administrative order WFX-522 was amended on July 17, 1984, to include injection into the State A A/C 1 No. 116 well which was later converted to a produced water disposal well under administrative order SWD-932.

6. FAE acquired the project in June 2021 and became the designated operator of the waterflood projects.

7. The project area is comprised of the following described 5,760 acres (more or less) of State trust lands located in Lea County, New Mexico:

TOWNSHIP 23 SOUTH, RANGE 36 EAST, NMPM

- Section 3: S/2
- Section 4: W/2, NE/4
- Section 9: all
- Section 10: all
- Section 11: W/2, NE/4
- Section 13: W/2, NE/4
- Section 14: N/2
- Section 15: N/2
- Section 17: SE/4
- Section 20: E/2
- Section 21: W/2, SE/4
- Section 22: W/2
- Section 23: N/2
- Section 24: W/2, SE/4

8. The following wells authorized by the previously referenced orders are located within the Jalmat;Tan-Yates-7 RVRs (Oil) and the Langlie Mattix;7 RVRs-Q-Grayburg pools of the Seven Rivers and Queen formations:

	Well Name and Number	Location within T23S, R36E, NMPM	Injection Interval (ft.)
(a)	State A A/C 1 No. 116 (API 30-025-28396)	1260' FNL & 1310' FWL, Unit D, Sec. 10	3644 - 3845
(b)	State A A/C 1 No. 117 (API 30-025-28512)	1395' FSL & 1345' FWL, Unit K, Sec. 3	3640 - 3820
(c)	State A A/C 1 No. 120 (API 30-025-28515)	25' FNL & 1345' FWL, Unit C, Sec. 10	3650 - 3800
(d)	State A A/C 3 No. 10 (API 30-025-28509)	1345' FNL & 1480' FEL, Unit G, Sec. 10	3575 - 3705
(e)	State A A/C 3 No. 11 (API 30-025-28510)	1345' FNL & 2615' FEL, Unit G, Sec. 10	3575 - 3705

9. Four of the wells (State A A/C 1 Nos. 117 and 120 and State A A/C 3 Nos. 10 and 11) were originally drilled as injectors within the Queen formation. Though approved as an injection well for a waterflood project, the State A 1 A/C1 No. 116 was initially drilled as a test well of deeper formations and later re-entered and completed as a produced water disposal well.

10. The injection authority for individual wells has expired at various times due to inactivity; however, injection and production did not lapse in the project area during this time period and the waterfloods remain intact as statutory units.

11. FAE now seeks an order to reactivate the injection authority for the above listed four wells and for the conversion of the produced water disposal well to injectors for purposes of enhanced recovery in the Blackbeard South Waterflood Project.

12. Applicant appeared at the hearing through counsel and presented evidence to the effect that:

(a) The project area will contain the original 5,760 acres of State trust land approved in Order No. R-4819 for the waterflood operation.

(b) The project area is within a single state lease where FAE owns the majority working interest.

(c) Exhibits presented in previous cases defined the "unitized interval" as the Jalmat and Langlie Mattix pools between the depths of 2,798 feet to 4,075 feet as found on Texas Pacific Coal and Oil Company State A A/C 3 No. 3 (API 30-025-09301) resistivity - spontaneous potential log.

(d) The perforated injection interval in the five wells ranges from 3575 to 3845 feet within the Seven Rivers and Queen formations. The four injector wells will inject fluids through a plastic-lined, 2.375-inch tubing set in a packer that is within 100 feet of the top perforation. The State A AC 1 No. 116 will inject fluids through a plastic-lined, 3.5-inch tubing set in a packer that is within 100 feet of the top perforation.

(e) The source of the water to be injected will be produced water from other Seven Rivers and Queen wells drilled on the lease and is not expected to cause compatibility issues.

(f) The waterflood will be injecting into the Seven River-Queen reservoir interval which consists primarily of sandstones interbedded with dolomites and anhydrites. The log shows the interval top at 3640 feet and the top is sealed by a low porosity/low permeability non-oil bearing Seven Rivers carbonate layer. The bottom of the interval is sealed by a low porosity/low permeability section of the Grayburg carbonate.

(g) Productive porosity typically ranges from 10% to 20% and averages around 16% throughout the interval.

(h) There is no evidence of open faults of hydrological connection between the proposed injection zone and underground sources of drinking water.

- (i) There is one active freshwater well within one mile of the proposed injection wells. Applicant provided analyses from two freshwater wells.
- (j) Applicant proposes a maximum daily injection rate of 1,000 barrels of water per day (“BWPD”) with an expected maximum injection pressure of 700 pounds per square inch-gauge.
- (k) The Applicant identified wells that penetrate the injection interval within the one-half mile Area of Review (“AOR”) for each of the proposed five injection wells and provided detailed wellbore information for the plugged and abandoned wells.
- (l) The Applicant states that the injection interval is confined by an upper and lower low porosity and permeability barriers which will keep the injected fluids from migrating out of the formation.
- (m) The proposed construction of the proposed injection wells will isolate and protect the underground sources of drinking water (“USDWs”).
- (n) The Applicant provided evidence of proper notification of this application to all "affected persons" and a notice of publication in a newspaper of general circulation in the county.

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

CONCLUSION OF LAW

14. The application has been duly filed under the provisions of 19.15.26.8 NMAC and FAE has presented satisfactory evidence that all requirements prescribed in 19.15.26.8 NMAC have been met.
15. The construction plans for four of the proposed injection wells provided in the application are protective of USDWs.
16. All wells that penetrate the proposed injection interval within a one-half mile AOR are adequately cased and cemented to isolate and confine the injected fluid within the permitted injection interval.
17. The OCD 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.
18. To prevent waste of oil and gas and protect correlative rights, the re-instatement of the injection authority of the waterflood project should be approved for the injection wells used in prior waterflood operations.

19. The OCD cannot approve the authority for inject for the State A A/C No. 116 for use in the waterflood project as proposed based on the following findings:

(a) The wellbore information provided in the application (FAE Exhibit A-5 for Case 22134; page 2 of Form C-108 dated September 8, 2021) for the well states a cement plug spotted at the shoe of the 8⁵/₈-inch production casing from 3950 feet to 4050 feet on January 13, 1984, after drilling the well to a total depth of 8400 feet.

(b) OCD records for this well contain a Form C-103 Subsequent Report [by Mission Resources Corporation and dated May 3, 2005] detailing the re-entry and conversion to a disposal well notes: “*Drilled soft cement to 4298’. Circ. hole clean. Tagged bottom @ 5805’. Acidized Openhole 4000’ to 5805 w/ 4000 gals. 15% NEFE HCL*”.

(c) Neither the well file nor the proposed well design in the Form C-108 exhibit submitted at hearing addresses the replacement of the plug to isolate the San Andres formation (correlated as the stratigraphic equivalent of the lower Capitan Reef aquifer) which is not within the unitized interval and potentially hydrologically connected to an USDW.

(d) Therefore, based on the evidence of record, the approval of the injection authority for this well shall require remedial action.

ORDER

1. The application of FAE II Operating, LLC (“FAE” or “Operator”; OGRID No. 329326) to authorize injection wells for enhanced oil recovery within the existing waterflood projects comprised of the above described 5,760 acres (more or less) of State trust lands located in Lea County, New Mexico, **is hereby approved**.

2. The project area shall remain unchanged as approved in Order No. R-4819 (as amended) and as described in Findings Paragraph 7.

3. For efficiency of operation, the two waterflood units are consolidated into the **Blackbeard South Waterflood Project** (“Project”) with the same authority for enhanced recovery in the Seven Rivers and Queen formations as approved in Order No. R-4819 (as amended).

4. The application of FAE to inject produced water into the Seven Rivers and Queen formations [Langlie Mattix;7 RVRS-Q-Grayburg pool (code 37240) and Jalmat;Tan-Yates-7RVRS (Oil) pool (code 33820)] **is hereby approved** for the following wells:

	Well Name and Number	Location within T23S, R36E, NMPM	Injection Interval (ft.)	MSIP (PSI)
(b)	State A A/C 1 No. 117 (API 30-025-28512)	1395' FSL & 1345' FWL, Unit K, Sec. 3	3640 - 3820	728
(c)	State A A/C 1 No. 120 (API 30-025-28515)	25' FNL & 1345' FWL, Unit C, Sec. 10	3650 - 3800	730
(d)	State A A/C 3 No. 10 (API 30-025-28509)	1345' FNL & 1480' FEL, Unit G, Sec. 10	3575 - 3705	715
(e)	State A A/C 3 No. 11 (API 30-025-28510)	1345' FNL & 2615' FEL, Unit G, Sec. 10	3575 - 3705	715

5. The application of FAE to convert the State A A/C No. 116 (API 30-025-28396) to an injection well within the unitized interval **is hereby approved with the following conditions.** FAE shall be required to complete the following activities prior to the commencing injection:

- (a) FAE shall confirm the total depth of the well by wireline verification. The Operator shall submit a Form C-103 Notice of Intent with opportunity for witness by OCD then submit a Form C-103 Subsequent Report with a copy to the OCD Engineering Bureau detailing the results of the wireline test.
- (b) If the wireline results adequately demonstrate the cement plug at the depth from 3950 feet to 4050 feet (above the shoe of the 8⁵/₈-inch production casing at 4000 feet), the Operator shall submit the results and receive approval to proceed with the conversion to an injection well.
- (c) If the wireline results demonstrate the total depth to be greater than the casing setting depth of 4000 feet, the Operator shall submit a Form C-103 Notice of Intent for approval of the placement of a cast-iron bridge plug with a 35-foot cement cap no farther than 75 feet above the shoe of the 8⁵/₈-inch production casing.

Failure to comply with this condition prior to the commencement of injection shall be determined to be a Significant Non-compliance under the Environmental Protection Agency Underground Injection Control Program guidance. The approved injection interval for this well shall also be for the Seven Rivers and Queen formations [Langlie Mattix;7 RVRS-Q-Grayburg pool and Jalmat;Tan-Yates-7 RVRS (Oil) pool].

6. The Operator shall take all steps necessary to ensure that the injected fluid enters only the injection interval and is not permitted to escape to other formations including the Capitan Reef aquifer or onto the surface from injection, production, or plugged and abandoned wells.

7. The injection wells shall be equipped with a pressure control device or acceptable substitute that will limit the maximum surface injection pressure (“MSIP”) for produced water **not to exceed pressures listed in Ordering Paragraph 4 and a daily injection rate not to exceed 1000 barrels of water.** The MSIP for State A A/C No. 116 (API 30-025-28396) shall not exceed 729 pounds per square inch (“PSI”) and a daily injection rate not to exceed 1000 barrels of water.

8. The Director shall have the authority to administratively authorize an increase in MSIP upon a showing supported by an approved Step-Rate Test that such higher pressure will not result in fracturing of the injection formation or confining strata. This test may also be used to administratively increase the daily injection volumes along with a demonstration that the increase volume shall benefit the waterflood operation.

9. The Operator shall provide written notice on Form C-103 to OCD E-Permitting and notify the OCD Engineering Bureau by email of the submittal at least 72 hours in advance of the date and time that any mechanical integrity pressure test will be conducted.

10. Injection shall be accomplished through tubing installed in a packer set in the production casing so as to provide a proper seal while being as close as practical to the uppermost injection perforations. The limit for the upper placement of the packer in the production casing shall be no greater than 100 feet above the true vertical depth of the uppermost perforation.

11. The casing-tubing annulus shall be filled with an inert fluid. Operator shall continuously monitor the annulus including a gauge attached to the annulus in order to detect leakage in the casing, tubing or packer.

12. Any existing well (active or plugged) approved for injection under this order or succeeding administrative expansion order shall complete the following requirements prior to the installation of the tubing and packer set:

- (a) Conduct a successful pressure test of the production casing following procedures provided in 19.15.16.10(I) NMAC; and
- (b) Obtain a new cement bond log (CBL) from surface to the top of the top perforation (or top of open hole) of the approved injection interval. A copy of the CBL shall be submitted electronically to the OCD Engineering Bureau email attached to a Form C-103.

13. If either the pressure test fails or the CBL demonstrates inadequate cement to protect shallow USDW, the operator shall be required to conduct corrective action on the well until the integrity issue is addressed and approved by the OCD.

14. The injection wells shall pass a mechanical integrity test prior to recommencement of injection under this order and prior to resumption of injection each time the packer is unseated. All testing procedures and schedules shall conform to the requirements of Rule 19.15.26.11(A) NMAC. The OCD Director retains the right to require at any time wireline verification of completion and packer setting depths.

15. The Operator shall immediately notify the appropriate OCD Inspections Supervisor and OCD Engineering Bureau by email of the failure of the tubing, casing or packer in either injection well, or the leakage of water, oil, gas or other fluid from or around any producing or abandoned well within one-half mile of an injection well and shall take all steps as may be timely and necessary to correct such failure or leakage. If the monitoring system indicates communication of the tubing with the annulus due to loss of mechanical integrity, the operator shall immediately proceed to shut-in the injection well and notify the appropriate OCD Inspections Supervisor and OCD Engineering Bureau by email.

16. The Operator shall provide written notice using Form C-103 to OCD E-Permitting and notify the OCD Engineering Bureau by email of the submittal no later than two (2) business days following the date on which injection commenced into the wells.

17. The Project shall be governed by Rules 19.15.26.8 through 19.15.26.15 NMAC. The operator shall submit monthly reports of the injection operations on Form C-115, in accordance with Rules 19.15.26.13 and 19.15.7.28 NMAC.

18. The injection authority granted herein shall terminate one year after the effective date of this order if the operator has not commenced injection operations; provided, however, the OCD, upon written request by the Operator filed prior to the expiration of the one-year time period, may grant an extension for good cause.

19. The injection authority granted herein shall be subject to 19.15.26.12(C)(1) NMAC [Abandonment of injection authority]. If necessary due to operational requirements that all injection wells in the Project are simultaneously not injecting for a continuous one-year period, the Operator shall maintain the injection authority of the order by requesting an extension as provided in 19.15.26.12(C)(2) NMAC.

20. The OCD Director may administratively authorize alternative or additional injection wells within the project area as provided in 19.15.26.8 NMAC.

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

22. The Operator shall provide written notice to the OCD upon permanent cessation of injection into the Project.

23. 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 OCD rules or other state, federal or local laws or regulations.

24. Upon failure of the operator to conduct operations (1) in such manner as will protect fresh water or (2) in a manner consistent with the requirements in this order, the OCD may, after notice and hearing (or without notice and hearing in event of an emergency, subject to the provisions of NMSA 1978 Section 70-2-23), terminate the injection authority granted herein.

25. Jurisdiction of this case is retained for the entry of such further orders as the OCD may deem necessary.

DONE at Santa Fe, New Mexico, on this 22nd of March 2022.

**STATE OF NEW MEXICO
OIL CONSERVATION DIVISION**

A handwritten signature in black ink, appearing to read 'Adrienne', written in a cursive style.

**ADRIENNE SANDOVAL
DIRECTOR**