

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

IN THE MATTER OF THE HEARING CALLED
BY THE OIL CONSERVATION COMMISSION
FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF LINN OPERATING, INC. TO
AMEND COMMISSION ORDER NO. R-11980-A
REGARDING THE EAST HOBBS SAN ANDRES
UNIT, LEA COUNTY, NEW MEXICO.

Case No. 15284

AMENDED PRE-HEARING STATEMENT

This pre-hearing statement is submitted by Linn Operating, Inc. as required by the Oil Conservation Commission.

APPEARANCES

APPLICANT

Linn Operating, Inc.
Suite 4900
600 Travis
Houston, Texas 77002

APPLICANT'S ATTORNEY

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Attention: Debra J. Gordon
Regulatory Compliance Manager
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OPPONENT

OPPONENT'S ATTORNEY

STATEMENT OF THE CASE

APPLICANT

Commission Order No. R-11980-A approved the East Hobbs San Andres Unit, a statutory unit, for the purpose of instituting a pressure maintenance project within the East Hobbs-San Andres Pool. The unit covers portions of Sections 29-32, Township 18 South, Range 39 East, NMPM.

Applicant seeks an order amending Order No. R-11980-A to eliminate Ordering Paragraph 9, which required that no fresh water be used as make-up water or otherwise be injected. Applicant

intends to institute a carbon dioxide flood in the Unit at a future date, but to do so needs to re-pressurize or fill up the reservoir, and the best and possibly only way to do so is to use fresh water from the City of Hobbs water system.

This case was heard on May 7, 2015. After the hearing the Commission deliberated and made the following decision:

- (a) The case would be continued to the July 16, 2015 docket.
- (b) Certified notice of the continued hearing should be sent to the City of Hobbs and the Commissioner of Public Lands.
- (c) Applicant should submit and address the provisions of the Unit Agreement and Unit Operating Agreement.
- (c) Applicant should address the following alternatives to using fresh water: (a) produced water; (b) fresh water from the Glorieta formation; (c) carbon dioxide; and (d) grey water.

Applicant will submit evidence that it has reviewed water sources to re-pressurize or fill up the reservoir for well over a year, and that, technically and economically, the best way to make the CO₂ project economic is to use City of Hobbs fresh water.

Applicant will submit the following exhibits:

Exhibit 1. This exhibit is a map with all salt water disposal wells spotted as identified in the State's database with the current operator and the last 3 months daily injection rate in barrels of water per day.

A 600 square mile search area was established around the East Hobbs San Andres Unit for produced oilfield water source. Four potential sources were located which had the required volumes based on State records. Only one of these sources was within 10 miles of the project.

The Knowles South field was the closest candidate at 9.25 miles pipeline route or 13.75 miles truck route. The produced water is from the Devonian Formation and operated by Resolute Energy. An economic evaluation of this scenario demonstrated it was uneconomic and so more distant options were not evaluated.

Exhibit 2. This exhibit is the water analysis for three waters; Hobbs San Andres Unit, City of Hobbs and Knowles South Field Devonian. Scale tendencies were computed using the public domain DOE/NETL "Water Mixing and Scale Affinity Model". Seven different indexes are listed for each water analyzed.

The preferred scale indicator is circled in red. Both oilfield brines have scale tendencies. The City water does not. Mixing City water into the San Andres water is compatible. The mix of Devonian and San Andres waters however, increases the volume of scale precipitated. These waters are not compatible.

Exhibit 3. This exhibit is a summary of economic evaluations made on the six water source scenarios.

Column 1 is the scenario.

Column 2 is the total cost both capital and expenses assuming it takes two years to re-pressurize the Unit to miscible pressure.

Column 3 is the failure case. This is the total cost both capital and expense after injecting for 6 months and fill up progress is not met resulting in project abandonment. This is Tabula Rasa's capital exposure excluding overhead costs.

Column 4 is the project delay time from the base case of City water source.

Column 5 is an explanation of the results. Only the City water source case is economic. The remaining cases are uneconomic due to the high costs, delays or water availability and or compatibility.

The costs of these alternatives are two and a half to seventeen times more expensive than City water source with capital exposures three to twenty four more times expensive than City water source.

Exhibits 4 - 9. Back-up economic data.

Exhibit 4 is the base case economics for a CO2 flood using City water source. This and all subsequent evaluations were computed assuming flat \$70 crude prices by the year 2018. Crude production forecasts and recoveries are also the same. Linn's 25% interest is carried in capital and CO2 costs.

The box to the upper right is the cost estimate for the source water. The grand total of \$1,413,280 is both capital and expenses over 2 years which is an equivalent of \$0.23 per barrel. If the field did not re-pressure as planned and the project is abandoned after 6 months of injection \$710,449 will have been spent. The equivalent Capital and expenses put in the economic model was \$340,000 capital and \$0.17 per barrel operating expense.

Exhibit 5 is the economics for a CO2 flood using trucked Knowles South water source. The same base prices and performance predictions as the Exhibit 4 evaluation were assumed.

The box to the upper right is the cost estimate for the source water. The grand total of \$13,324,779 is both capital and expense over 2 years which is an equivalent of \$2.12 per barrel. If the field did not re-pressure as planned and the project is abandoned after 6 months of injection \$3,646,293 will have been spent. The equivalent Capital and expenses put in the economic model was \$598,153 capital and \$2.03 per barrel operating expense.

The Devonian water was found not to be compatible with San Andres water and in conversations with Resolute, the operator, has indicated that this water is not available for our use.

The cost and toll of over 100,000 truck trips through the City of Hobbs in both road damage and traffic safety is not known nor considered in the evaluation.

Exhibit 6 is the economics for a CO2 flood using pipelined Knowles South water source. The same base prices and performance predictions as the Exhibit 4 evaluation were assumed.

The box to the upper right is the cost estimate for the source water. The grand total of \$5,321,627 is both capital and expense over 2 years which is an equivalent of \$0.85 per barrel. If the field did not re-pressure as planned and the project is abandoned after 6 months of injection \$3,516,128 will have been spent. The equivalent Capital and expenses put in the economic model was \$1,942,117 capital and \$0.54 per barrel operating expense.

The Devonian water was found not to be compatible with San Andres water and in conversations with Resolute, the operator, has indicated that this water is not available for our use.

The exact pipeline right of way has not been negotiated, but was assumed. No pipeline abandonment costs or brine spill liabilities have been considered in this evaluation

Exhibit 7 is the economics for a CO2 flood using new Glorieta Formation South water source wells. The same base prices and performance predictions as the Exhibit 4 evaluation were assumed.

The box to the upper right is the cost estimate for the source water. The grand total of \$15,181,648 is both capital and expense over 2 years which is an equivalent of \$2.42 per barrel. If the field did not re-pressure as planned and the project is abandoned after 6 months of injection \$12,756,799 will have been spent. The equivalent Capital and expenses put in the economic model was \$10,736,091 capital and \$0.71 per barrel operating expense.

It was assumed Glorieta water is compatible with San Andres waters. Water rights within the Unit have not been examined and no costs were paid to the surface owners for Glorieta water.

Exhibit 8 is the economics for a CO2 flood using CO2 only for fill up. The same base prices and performance predictions as the Exhibit 4 evaluation were assumed.

The box to the upper right is the cost estimate for the source water. The grand total of \$25,170,477 is both capital and expense over 2 years which is an equivalent of \$4.01 per barrel. If the field did not re-pressure as planned and the project is abandoned after 6 months of injection \$17,073,084 will have been spent. The equivalent Capital and expenses put in the economic model was \$3,118,940 capital and \$3.51 per barrel operating expense.

Tabula Rasa Energy does not have access to an 18 mmscfd CO2 contract at this time but it was assumed it was available in the analysis. Acceleration of well work in preparation for CO2 injection and the loss of base oil production costs were considered. Loss of oil recovery due to immiscible injection and crude partitioning was not considered in the evaluation.

Exhibit 9 is the economics for a CO2 flood using piped City Greywater source. The same base prices and performance predictions as the Exhibit 4 evaluation were assumed.

The box to the upper right is the cost estimate for the source water. The grand total of \$3,494,420 is both capital and expense over 2 years which is an equivalent of \$0.56 per barrel. If the field did not re-pressure as planned and the project is abandoned after 6 months of injection \$2,098,069 will have been spent. The equivalent Capital and expenses put in the economic model was \$2,001,373 capital and \$0.24 per barrel operating expense.

Availability, City Master Plan, timing, chemical treatment and costs of greywater are still significant unknowns or risks in the evaluation.

Exhibit 10. Letter from the City of Hobbs.

Exhibit 11. Letter to the Commissioner of Public Lands requesting approval to use fresh water, pursuant to Section 18 of the Unit Agreement (attached hereto as Exhibit A.)

Exhibit 12. Unit Agreement.

Exhibit 13. Unit Operating Agreement.

Exhibit 14. Notice affidavit.

OPPONENT

PROPOSED EVIDENCE

APPLICANT

<u>WITNESSES</u>	<u>EST. TIME</u>	<u>EXHIBITS</u>
Robert B. Sutherland (engineer)	45 min.	Approx. 14

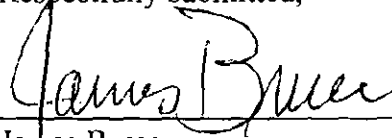
OPPONENT

<u>WITNESSES</u>	<u>EST. TIME</u>	<u>EXHIBITS</u>
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PROCEDURAL MATTERS

-None-

Respectfully submitted,

A handwritten signature in cursive script, reading "James Bruce", written over a horizontal line.

James Bruce
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(505) 982-2043

Attorney for Linn Operating, Inc.

recovery, which shall be in conformance with a plan first approved by the Commissioner and Division; part or all of such liquefied petroleum gases may be withdrawn royalty free pursuant to such conditions and formula as may be prescribed or approved by the Commissioner and Division.

Royalty due on account of State lands shall be computed and paid on the basis of all Unitized Substances allocated to such lands.

SECTION 17. RENTAL SETTLEMENT: Rentals or minimum royalties due on leases committed hereto shall be paid by Working Interest Owners responsible therefore under existing contracts, laws and regulations, provided that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for payment of any rental or minimum royalty in lieu thereof due under their leases. Rental for lands of the State of New Mexico subject to this agreement shall be paid at the rate specified in the respective leases from the State of New Mexico, or may be paid at the rate specified in the respective leases from the State of New Mexico, or may be reduced or suspended under order of the Commissioner pursuant to applicable laws and regulations.

SECTION 18. CONSERVATION: Operations hereunder and production of Unitized Substances shall be conducted to provide for the most economical and efficient recovery of said substances without waste, as defined by State laws and regulations. The use of fresh water in waterflood operations is prohibited unless expressly approved by the Commissioner of Public Lands on the basis of excessive technological or financial burden.

SECTION 19. DRAINAGE: The Unit Operator shall take appropriate and adequate measures to prevent drainage of Unitized Substances from unitized lands by wells on land not subject to this agreement, or, with consent of the Commissioner and pursuant to applicable regulations, pay a fair and reasonable compensatory royalty as determined by the Commissioner.

SECTION 20. LEASES AND CONTRACTS CONFORMED AND EXTENDED: The terms, conditions and provision of all leases, subleases and other contracts relating to exploration, drilling, development or operation for oil or gas on lands committed to this agreement are hereby expressly modified and amended to the extent necessary to make the same conform to the provisions hereof, but otherwise to remain in full force and effect, and the parties hereto hereby consent that the Commissioner, as to State leases, shall by his approval hereof or by the approval hereof by his duly authorized representative, does hereby establish, alter, change or revoke the drilling, producing, rental minimum royalty and royalty requirements of State leases committed hereto and the regulations in respect thereto to conform said requirements to the provisions of this agreement. Without limiting the generality of the foregoing, all leases, subleases and contracts are particularly modified in accordance with the following:

- (a) The development and operation of lands subject to this agreement under the terms hereof shall be deemed full performance of all obligations for development and operation with respect to each and every part or separately owned Tract subject to this agreement, regardless of whether there is any development of any particular part or Tract of the Unit Area, notwithstanding anything to the contrary in the lease, operating agreement or other contract by and between the parties hereto, or their respective predecessors in interest, or any of them.
- (b) Drilling, producing secondary recovery or enhanced oil operations performed hereunder upon any Tract of unitized lands shall be accepted and deemed to be performed upon and for the benefit of each and every Tract of unitized land, and no lease shall be deemed to expire by reason of failure to drill or produce wells situated on land therein embraced.
- (c) Suspension of drilling or producing operations on all unitized land pursuant to direction or consent of the Division and Commissioner or their duly authorized representatives, shall be deemed to constitute such suspension pursuant to such direction or consent as to each and every Tract of unitized lands.
- (d) Each lease, sublease, or contract relating to the exploration, drilling, development or operation for oil and gas which by its terms might expire prior to the termination of this