

**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:**

CASE NO. 13041

**APPLICATION OF ENERQUEST RESOURCES, L.L.C. FOR APPROVAL OF A
WATERFLOOD PROJECT AND QUALIFICATION OF THE PROJECT AREA
FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE ENHANCED
OIL RECOVERY ACT, LEA COUNTY, NEW MEXICO.**

CASE NO. 13042

**APPLICATION OF ENERQUEST RESOURCES, L.L.C. FOR STATUTORY
UNITIZATION, LEA COUNTY, NEW MEXICO.**

ORDER NO. R-11980-A

ORDER OF THE OIL CONSERVATION COMMISSION

BY THE COMMISSION:

These cases came on for hearing before the Oil Conservation Commission on September 12, 2003, at Santa Fe, New Mexico, and the Commission having carefully considered the applications and the evidence and arguments of counsel both in support thereof and in opposition thereto; now, on this 14th day of November, 2003,

FINDS:

1. Due public notice has been given, and the Commission has jurisdiction of these cases and the **subject** matter.
2. In Case No. 13042, EnerQuest seeks (a) **statutorily unitization**, pursuant to NMSA 1978 Sections 70-7-1 through 70-7-21, as amended ("the Statutory Unitization Act"), of 920 acres, more or less, located in portions of Sections 29 through 32, Township 18 South, Range 39 East, **NMPM**, Lea County, New Mexico ("the Unit Area"), for the purpose of instituting a pressure maintenance project within the East **Hobbs-San Andres** Pool, to be called the East Hobbs San Andres Unit, and (b) approval of the Unit Agreement and the Unit Operating Agreement, which were submitted as applicant's Exhibits 4 and 5, respectively, in this case.

3. In Case No. 13041, EnerQuest seeks approval to institute a pressure maintenance project by the injection of water into the San Andres formation, East Hobbs-San Andres Pool, initially through four injection wells shown on Exhibit "A" attached to this order. EnerQuest further seeks provisions allowing for the administrative approval of additional injection wells in succeeding phases of operation. EnerQuest further seeks to qualify the proposed project as an "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (NMSA 1978 Sections 7-29A-1 through 7-29A-5, as amended).

4. Cases No. 13041 and 13042 were consolidated at the hearing for the purpose of testimony. Because the cases involve the same property and subject matter, a single order is being entered disposing of both cases.

5. EnerQuest initially filed applications for statutory unitization of the proposed Unit Area and for a secondary recovery project on February 26, 2002. On April 12, 2002, the "Key Family Group" and on April 29, 2002, "Lynx Operating Company," both being or representing working interest owners of properties in the Unit Area, filed motions to dismiss based on EnerQuest's failure to make a good faith effort to secure voluntary participation in the proposed unitization.

6. By Order No. R-11781 issued June 7, 2002, in Cases No. 12845 and 12846, the Division found that EnerQuest had not made a good faith effort to secure voluntary unitization as required by the Statutory Unitization Act, and the Division dismissed both cases.

7. By Order No. R-11980, entered on July 9, 2003, the Division denied both applications. These cases are now before the Commission pursuant to the application of EnerQuest Resources, L.L.C. ("EnerQuest") for *de novo* review.

8. The proposed Unit Area consists of 920 acres, more or less, in Lea County, New Mexico, described as follows:

TOWNSHIP 18 SOUTH, RANGE 39 EAST, NMPM

Section 29: SW/4, SW/4 NW/4
Section 30: S/2, S/2 N/2
Section 31: N/2 N/2
Section 32: N/2 NW/4

9. The proposed vertical extent ("Unitized Formation") of the unit is that interval extending from 50 feet above the top of the San Andres formation to a point 50 feet below the base of the P-5 marker in the San Andres formation. This interval specifically occurs between 4441 feet and 4687 feet in the density-neutron log dated June 26, 1997, for the Carrie O. Davis Well No. 5 (API No. 30-025-34013) located 1310 feet from the South line and 330 feet from the West line (Unit L) of Section 29, Township 18 South, Range 39 East, NMPM, Lea County, New Mexico.

10. EnerQuest presented the testimony of land specialist, M. Craig Clark, as follows:

(a) EnerQuest has been purchasing interests in this proposed unit area since 1996 and prepared a **waterflood** feasibility study in the fall of 2000. In early 2002, a proposed unit agreement and unit operating agreement were prepared and circulated to the owners in the proposed Unit Area. Following the Division order signed on June 7, 2002 dismissing the first application, EnerQuest continued to purchase working interests, conducted three working interest owner meetings and seven technical committee meetings, negotiated with other working interest owners and formulated a new plan pursuant to the recommendation of the working interest owners' technical committee.

(b) The proposed Unit contains twelve separate tracts owned by numerous parties. Eleven of the tracts, comprising 840 acres, are in private ownership. One tract, comprising 80 acres, is State of New Mexico public land currently under lease. EnerQuest is the operator of all but one of the tracts and owns approximately 45% of the combined working interest in the Unit Area. Approximately 88% of the working interest and 69% of the royalty interest were committed to the Unit at the time of the hearing.

11. EnerQuest presented the testimony of petroleum engineer, Roy C. Williamson, as follows:

(a) The San Andres formation consists of five geologically distinct zones, identified as **P-1** through P-5. The best San Andres intervals for secondary recovery would be the P2 through P4 zones. As depicted on a net thickness isopach map (Exhibit 10), this interval is quite thick in the center of the field, especially in Tracts 5 through 8 (as identified on ownership map admitted as Exhibit 3), and portions of Tracts 1 and 12, and feathers out to the north, south, east and west.

(b) The tracts with greater net thickness should contribute relatively more reserves and present a better target for secondary recovery than the edge tracts. However, even though the edge tracts are thinner, all tracts within the unit area will probably contribute to secondary production.

(c) The proposed secondary recovery operation is feasible, and the proposed Unit Area can be efficiently and effectively operated under the proposed unit plan of development.

(d) The secondary recovery operation would be initiated with four injection wells and be implemented rapidly in phases until the entire **unitized** area is swept by injection wells.

(e) The estimated remaining primary gross production from the Unit Area amounts to approximately 921,000 barrels of oil and 1.2 billion cubic feet (**bcf**) of gas, having a total discounted present value of approximately \$7 million.

(f) The estimated future gross production from the Unitized Formation of the Unit Area if the proposed secondary recovery operation is implemented is approximately 9.7 million barrels of oil and 3 bcf of gas, having a total discounted present value of approximately \$81 million dollars; resulting in additional gross production of 8.8 million barrels of oil and 1.8 bcf of gas, having a discounted present value of approximately \$74 million dollars.

(g) The **P-1** zone has been affected by natural water encroachment such that it has, to a large extent, already become water saturated, and minimal additional production can be expected from water injection into this zone. The **P-5** zone is wet and therefore unproductive.

(h) The conclusion that the **P-1** has already been, in effect, **waterflooded** is based on the much higher rate of recovery evidenced by historical production from the **P-1** zone (24.9% versus 2.8% for the **P-2** through **P-4** zones), and on observed water-oil ratios from **P-1** production, which have increased dramatically and progressively since 1991.

(i) Because of the water saturation that has already occurred in the **P-1** zone, historical production prior to 1997, which was almost entirely from the **P-1** zone, is not a valid indicator of the extent of reserves remaining under particular tracts that can be economically recovered by water injection operations.

(j) As part of the **waterflood** feasibility study, a complete rock study was prepared by an independent consultant, all logs and cores were analyzed, and composite projections of water saturation and relative permeability were developed for the **P1** zone and for the **P2** through **P4** zones. The resulting projections support the conclusion that minimal additional oil can be recovered from the **P1** zone by water injection operations, and that significant additional production from the **P2** through **P4** zones is probable.

(k) **EnerQuest's** proposed tract participation formula consists of: Acreage (2.5%) + Recent 12 Months (December 2001 through

November 2002) Production (97.5%). In the witness's opinion, this formula allocates unit production on a fair, reasonable and equitable basis.

(l) Unitized management of this pool is necessary to effectively implement and carry on the proposed secondary recovery operations.

(m) EnerQuest is proposing a 200% **nonparticipation** penalty, to apply to parties unitized by order who elect not to participate in subsequent operations.

(n) Each of the four proposed injection wells will inject an average of 500 barrels (maximum of 750 barrels) of produced water per day. No fresh makeup water will be used.

(o) The average injection pressure is expected to be 600 psig, and will not exceed a maximum of 890 pounds psig or 0.2 psig per foot of depth to the depth of the uppermost perforation in each injection well, whichever is less.

(p) The fresh water interval in this area consists of the Ogallala fresh water sands located from 50 to 200 feet deep. Active and plugged and abandoned wells within the area of review (1/2 mile) of each proposed initial injection well have adequate cement to isolate the injection interval and to protect fresh water, and no remedial work is required on these wells to enable EnerQuest to safely operate the project. The proposed injection operation will not pose a threat to any freshwater supplies.

(q) The estimated additional costs of operation of the unit pursuant to the proposed secondary recovery plan are \$7.1 million in project costs and an additional \$17.9 million in additional operating costs, to generate additional production of 8.8 million barrels of oil, together with associated gas, having a total discounted present value of approximately \$74 million.

(r) Although the projected 7 to 1 ratio of secondary reserves to primary reserves from the P2 through P4 zones may be unusually high, it reflects the extremely low rate of recovery (2.8%) experienced with primary production from those zones.

12. Lowe Partners, LP ("**Lowe**"), owner of a 4.25% overriding royalty interest in Tract 10, and Rocket Oil and Gas Company, L.P., appeared through counsel in opposition to the application.

13. Lowe presented the testimony of petroleum engineer, Richard A. Gill, as follows:

(a) Lowe does not oppose the proposed secondary recovery operation, but objects to the participation formula proposed by EnerQuest as not being fair, reasonable and equitable.

(b) Lowe proposes a two-phase allocation formula, as follows:

Phase I: Last 12 Months Production (97.5%) + Acreage (2.5%)
(Phase I would last until total remaining primary reserves are produced.)

Phase II: Estimated Ultimate Recovery (97.5%) + Acreage (2.5%)

(c) Most of the wells in the Unit Area were drilled and have produced since the 1950's, or were drilled subsequent to 1997. The wells drilled after 1997 are basically all P2 through P4 producers. Everything prior to that time was P1 production.

(d) Production to date from the P1 zone has been over 5.5 million barrels of oil, and there are maybe 100,000 to 150,000 barrels of primary reserves remaining in the P1 zone.

(e) The future secondary performance under unitized operations can be predicted by the total primary production from the entire San Andres interval. The overall secondary to primary recovery ratio if P1 primary production is included, based on EnerQuest's estimates of secondary production, is 1.2 to 1.3 to 1, a ratio that is reasonable to expect based on other San Andres waterflood operations, as distinguished from the 7 to 1 ratio predicted by EnerQuest for the P2 through P4 zones only.

(f) Almost all of the past production from Tract 10 is from the P1 interval.

(f) The only well remaining on Tract 10 may be below the limit of economic production, so that Lowe will likely receive no more income from its overriding royalty if secondary recovery operations are not implemented. Lowe will likely receive ultimate revenues of \$12,000 to \$14,000 from unit production under the formula proposed by EnerQuest.

14. Lowe also presented a letter from James R. Small of Small GeoServices, Inc. to the Division written March 25, 2003. In this letter, Mr. Small objected to the proposed formula for tract participation, in particular the 97.5% emphasis on current production levels. Mr. Small pointed out that the wells on his minerals are approximately 40 years old and currently at low production levels but have significant cumulative production. Mr. Small did not specify in his letter the acreage or tracts his minerals are under, but the schedule of ownership supplied by EnerQuest shows James R. Small to own an overriding royalty in Tracts 1, 2, 9, 10, and 11, all "edge" tracts on which are located only older wells that, according to Mr. Gill's testimony, produced primarily from the P1 zone. Mr. Small did not appear at the hearing or offer any evidence.

15. The unitized management, operation and further development of the East Hobbs-San Andres Pool in the proposed Unit Area is reasonably necessary in order to effectively carry on the proposed secondary recovery project, which will substantially increase the ultimate recovery of oil and gas from this pool, and delays in implementing this project are detrimental to ultimate recovery from this reservoir. No party opposes the implementation of the secondary recovery project or the unitization of the Unit Area.

16. The exclusion of past production from the P1 San Andres zone as a factor in the unit allocation formula is the only point of disagreement between the applicant and the owners who have appeared or presented objections to the applications in these cases.

17. Based on the relatively high percentage of recovery achieved in the P1 zone compared to the other San Andres zones in the Unit Area, and the extremely high water/oil ratios encountered in recent P1 production, it is reasonable to conclude that the P1 zone has been subjected to natural **waterflooding** already, and that water injection will result in minimal incremental production from that zone.

18. The vast majority of historical production from the Unit Area was from the P1 zone. Since that zone contains very little recoverable secondary reserves, a unit allocation formula such as that proposed by Lowe, based principally on historical primary production, would not be fair, reasonable and equitable.

19. Since production in the P2 through P4 zones was recently established, current production, as reflected in the allocation formula proposed by EnerQuest, is a reasonable indicator of the extent of P2 through P4 reserves underlying the respective tracts in the Unit Area. Such formula will also take account of remaining P1 reserves, since the formula includes recent P1 production.

20. There is a general correlation between recent production from the respective tracts and the net thickness of the P2 through P4 production interval, as reflected in the isopach map prepared by EnerQuest's engineering witness (Exhibit 10).

21. Since production from the P1 zone and production from the P2 through P4 zones have not been separately measured, a more accurate estimate of recoverable P2

through P4 reserves underlying each of the separate tracts in the Unit Area cannot practicably be made at this time.

22. Accordingly, the Commission concludes that the participation formula proposed by EnerQuest and contained in the proposed Unit Agreement allocates the produced and saved, unitized hydrocarbons to the separately owned tracts in the Unit Area on a fair, reasonable and equitable basis.

23. The other provisions of the proposed Unit Agreement and Unit Operating Agreement, including but not limited to the provision for a 200% risk charge to be recovered out of the interest of working interest owners who decline to participate in subsequent operations and providing for overhead charges of \$3,500 per month while drilling and \$350 per month while producing, are likewise fair and reasonable.

24. The statutory unitization of the Unitized Formation within the Unit Area in accordance with the plan embodied in the Unit Agreement and the Unit Operating Agreement will prevent waste and protect correlative rights.

25. The proposed unitized method of secondary recovery operations within the Unit Area is feasible and will result with reasonable probability in the recovery of substantially more oil and gas from the unitized portion of the pool than would otherwise be recovered.

26. The estimated additional costs of the proposed operations will not exceed the estimated value of the additional oil and gas recovered plus a reasonable profit.

27. Statutory unitization and adoption of applicant's proposed unitized method of operation will benefit the working interest and royalty interest owners within the proposed Unit Area, and will prevent waste and protect correlative rights of all parties.

28. EnerQuest has made a good faith effort to secure voluntary unitization of the Unitized Formation within the Unit Area.

29. The proposed Unit Agreement and Unit Operating Agreement contain satisfactory provisions with respect to all of the matters required by NMSA 1978 Section 70-7-7, as amended.

30. EnerQuest has obtained preliminary approval of the proposed unit from the Commissioner of Public Lands for the **State** of New Mexico.

31. The proposed plan for unit operations set forth in the Unit Agreement and the Unit Operating Agreement have been approved in writing by persons who, under this order, will be required initially to pay at least **seventy-five** percent (75%) of the costs of the unit operations.

32. The proposed pressure maintenance project should be approved, and the project should be governed by Division Rules No. 701 through 708.

33. The evidence presented demonstrates that:

- (a) the application for approval of the proposed secondary recovery project has not been prematurely filed either for economic or technical reasons;
- (b) the area affected by the proposed project has been so depleted by primary operations that it is prudent to apply secondary recovery techniques to maximize the ultimate recovery of crude oil from the East Hobbs-San Andres Pool; and
- (c) the proposed secondary recovery project meets all the criteria for certification by the Division as a qualified "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (NMSA 1978 Sections 7-29A-1 through 7-29A-5).

IT IS THEREFORE ORDERED THAT:

1. The application of EnerQuest for the statutory unitization of the Unitized formation within the Unit Area, to be known as the East Hobbs San Andres Unit, is hereby approved pursuant to the Statutory Unitization Act, NMSA 1978, Sections 70-7-1 through 70-7-21, as amended.

2. The Unit Area shall consist of 920 acres, more or less, in Lea County, New Mexico, described as follows:

TOWNSHIP 18 SOUTH. RANGE 39 EAST. NMPM

Section 29: SW/4, SW/4 NW/4
Section 30: S/2, S/2 N/2
Section 31: N/2 N/2
Section 32: N/2 NW/4

3. The Unitized Formation shall be that interval extending from 50 feet above the top of the San Andres formation to a point 50 feet below the base of the P-5 marker in the San Andres formation. This interval specifically occurs between 4441 feet and 4687 feet in the density-neutron log dated June 26, 1997, for the Carrie O. Davis Well No. 5 (API No. 30-025-34013) located 1310 feet from the South line and 330 feet

from the West line (Unit L) of Section 29, Township 18 South, Range 39 East, NMPM, Lea County, New Mexico.

4. The Unit Agreement and the Unit Operating Agreement, which were admitted in evidence at the hearing as Exhibits 4 and 5, respectively, are hereby incorporated by reference into this order.

5. This order shall not become effective unless and until the plan for unit operations prescribed hereby has been approved in writing by the owners of at least seventy-five percent of the production or proceeds thereof that will be credited to interests which are free of costs, such as royalties, overriding royalties and productions payments, and the Division has made a finding in a supplemental order that the plan for unit operations has been so approved. When persons owning the required percentage of interest in the Unit Area have approved the plan for unit operations, the interests of all persons in the Unitized Formation as to the Unit Area are unitized whether or not such persons have approved the plan of unitization.

6. The applicant shall notify the Division Director in writing of any removal of the applicant as unit operator or substitution as unit operator of any other working interest owner within the Unit Area. In the event a person other than EnerQuest assumes operation of the unit established hereby, such person shall comply with all the terms and provision of this order.

7. The unit established hereby shall terminate upon the plugging and abandonment of the last well in the Unit Area completed in the Unitized Formation.

8. EnerQuest is hereby authorized to institute a pressure maintenance **project** within the Unit Area by the injection of produced water into the Unitized Formation of the East **Hobbs-San** Andres Pool through the four wells shown on Exhibit "A" attached to this order located in Section 30, Township 18 South, Range 39 East, NMPM, Lea County, New Mexico.

9. No fresh water shall be used as make-up water or otherwise injected.

10. EnerQuest 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 or onto the surface from injection, production, or plugged and abandoned wells.

11. Injection into each of the wells shown on Exhibit "A" shall be accomplished through 2 3/8 inch internally plastic-lined tubing installed in a packer located within 100 feet of the uppermost injection perforations or casing shoe. The casing-tubing **annulus** shall be filled with an inert fluid, and a gauge or approved leak-detection device shall be attached to the annulus in order to determine leakage in the casing, tubing, or packer.

12. The injection wells or **pressurization** system shall be equipped with a pressure control device or acceptable substitute that will limit the surface injection pressure to no more than 890 pounds psig or 0.2 psig per foot of depth to the depth of the uppermost perforation in the injection well, whichever is less.

13. The Division Director may administratively authorize a pressure limitation in excess of the above upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

14. The Division Director may administratively authorize additional injection wells within the Unit Area as provided in Division Rule 701.F(3).

15. Prior to commencing injection operations, the casing in each well shall be pressure tested throughout the interval from the surface down to the proposed packer setting depth to assure the integrity of such casing.

16. The unit operator shall give advance notice to the supervisor of the Division's Hobbs District Office of the date and time (i) injection equipment will be installed, and (ii) the mechanical integrity pressure test will be conducted on the proposed injection wells, so that these operations may be witnessed.

17. The unit operator shall immediately notify the supervisor of the Division's Hobbs District Office of any failure of the tubing, casing or packer in any of the injection wells or the leakage of water, oil or gas from or around any producing or plugged and abandoned well within the project area, and shall promptly take all steps necessary to correct such failure or leakage.

18. The unit operator shall conduct injection operations in accordance with Division Rules No. 701 through 708, and shall submit monthly progress reports in accordance with Division Rules No. 706 and 1115.

19. The injection authority granted herein for each well shown on Exhibit "A" shall terminate one year after the date of this order if the unit operator has not commenced injection operations into the well; provided, however, the Division, upon written request, may grant an extension for good cause.

20. The pressure maintenance project authorized by this order shall be known as the East Hobbs San Andres Unit Pressure Maintenance Project.

21. The East Hobbs San Andres Unit Pressure Maintenance Project is hereby certified as an "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (NMSA 1978 Sections 7-29A-1 through 7-29A-5). The project area shall initially comprise the entire East Hobbs San Andres Unit, described in Ordering Paragraph No. (1); provided however, the project area **and/or** the producing wells eligible for the

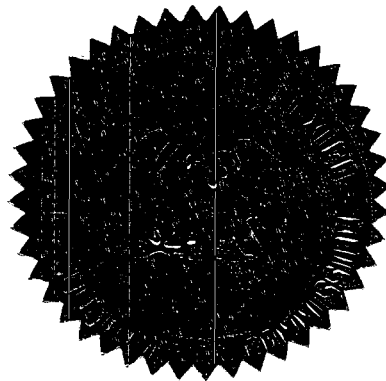
enhanced oil recovery (EOR) tax rate may be contracted and reduced based upon the evidence presented by the unit operator in its demonstration of a positive production response.

22. To be eligible for the EOR tax rate, the unit operator shall advise the Division of the date and time water injection commences within the secondary recovery project. At that time, the Division will certify the project to the New Mexico Taxation and Revenue Department.

23. At such time as a positive production response occurs, and within five years from the date the project was certified to the New Mexico Taxation and Revenue Department, the unit operator must apply to the Division for certification of a positive production response. This application shall identify the area benefiting from enhanced oil recovery operations and the specific wells eligible for the EOR tax rate. The Division may review the application administratively or set it for hearing. Based upon the evidence presented, the Division will certify to the New Mexico Taxation and Revenue Department those wells that are eligible for the EOR tax rate.

24. Jurisdiction is hereby retained for the entry of such further orders as the Division may deem necessary.

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



STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Lori Wrotenbery
LORI WROTENBERY, CHAIR

Jami Bailey
JAMI BAILEY, MEMBER

Robert Lee
ROBERT LEE, MEMBER

SEAL

East Hobbs San Andres Unit Pressure Maintenance Project
Approved Injection Wells

<u>Well Name and Number</u>	<u>API Number</u>	<u>Location</u>
East Hobbs Unit No. 604W	not yet assigned	Unit O - Section 30-1 8S-39E
East Hobbs Unit No. 605W	not yet assigned	Unit O - Section 30-1 8S-39E
East Hobbs Unit No. 606W	not yet assigned	Unit P - Section 30-1 8S-39E
East Hobbs Unit No. 607W	not yet assigned	Unit P - Section 30-1 8S-39E