

**OIL & GAS DOCKET NO. 8A-0263135**

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**THE APPLICATION OF WARREN AMERICAN OIL COMPANY TO CONSIDER  
UNITIZATION AND SECONDARY RECOVERY AUTHORITY FOR THE NORTH  
WASSON UNIT IN THE WASSON FIELD AND CONSOLIDATION OF THE WASSON,  
NORTH (SAN ANDRES) AND WASSON FIELDS , YOAKUM COUNTY, TEXAS**

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**HEARD BY:** Andres J. Trevino P.E., Technical Examiner  
Mark Helmueller, Hearings Examiner

**DATE OF HEARING:** October 12, 2009

**APPEARANCES:**

James Bostic  
Doug Norton  
Tom Turmelle  
Cheryl Dixon

**REPRESENTING:**

Warren American Oil Company

**EXAMINERS' REPORT AND RECOMMENDATION**

**STATEMENT OF THE CASE**

Warren American Oil Company requests Commission authority for unitization of the North Wasson Unit and approval of secondary recovery operations on the Unit in the Wasson Field. Additionally, Warren request approval to convert to injection the last or only producing wells on certain tracts in the Unit and to transfer certain wells from the Wasson, North (San Andres) Field to the Wasson Field or alternatively consolidate the Wasson, North (San Andres) Field into the Wasson Field.

This application was unopposed and the examiners recommend approval.

**DISCUSSION OF THE EVIDENCE**

The Wasson Field was discovered in 1937 at an approximate depth of 4,900 feet. The Wasson Field has over 2,000 wells which have produced over two billion barrels of oil. The North Wasson Unit is located in the far northeast edge of the Wasson Field. Development in the North Wasson Unit began in 1979 thru 1986. Production peaked in 1984 with a monthly production rate of 7,900 BO per month. Current production is

approximately 1,824 BO per month from 16 wells in the Unit area.

The area proposed for the subject unitization covers acreage that includes the majority of the productive reservoir under the unit boundary. The reservoir limits are defined by a decrease in net pay to the south and east and by an oil-water contact to the north and west. The reservoir is believed to include both drained and undrained areas. Leaseholders of productive areas not in the unit were offered to participate in the unit. The area is in the late stage of primary production. Cumulative primary production from the 23 wells is 1,165,320 BO, or 8% of original oil in place. Remaining primary production from wells on the unit is estimated to be 408,680 BO.

The unitized formation is the San Andres formation which is a shelf margin deposit composed of dolomitized carbonate forming a localized small anticline that plunges to the northeast. The proposed San Andres interval contains four separate distinct porosity zones and a possible Transition Zone in the field. The zones are identified as Zones 1, 2, 3 and 4. The zones exist in most wellbores but contain varying oil productivity in each zone from well to well. The Transition Zone was included as other operators are injecting CO<sub>2</sub> into the zone and are producing commercial quantities of oil. The formation is described as the dolomitized carbonate formation encountered in the interval from 5,120 feet to 5,550 feet on the log of the Warren American Oil Company Sullivan No. 1, (API No. 42-501-31606) located in the J. H. Gibson Survey, Section 567, Block D, Yoakum County, Texas.

Average porosity is 10.3% and average water saturation is 26%. The initial reservoir pressure was 2,100 psi and current pressure beneath the unit area is estimated at 800 psi. Warren American performed extensive waterflood studies of other analogous San Andres reservoirs nearby to predict the waterflood's performance. The waterflood program will consist of 17 producing wells and 17 injection wells. Initially make up water will be supplied from two reactivated producing wells completed in the lower San Andres formation that is not productive of oil. Warren America will convert 9 existing wells to injection wells and will drill 8 new injection wells and 6 new producing wells. Warren America has requested that the last or only producing wells on certain tracts be converted to injection. Warren America will only convert the last or only producing well on tracts it has 100% royalty sign up or has drilled and completed a new producing well on tracts it does not have 100% royalty sign up. Tracts 2, 9 and 11 have or will have 100% royalty sign up and will convert existing wells to injectors. Tracts 7, 8 and 11 will have new wells drilled and completed prior to converting existing wells to injectors.

The proposed North Wasson Unit consists of 12 tracts which contain a total of 880 acres. There are approximately 30,018 acre-feet of San Andres net-pay in the proposed unit area. The participation formula is based on equal 25% weights to current producing rate, estimated ultimate recovery, useable wells and porosity-acre-feet. The Unit Agreement has been ratified by over 88% of the royalty interest ownership and 100% of the working interest ownership. There are no state lands in the Unit Area.

It is estimated that the total cost to implement the project will be \$22,164,000.

Secondary reserves are estimated to be 1,574,000 BO. Estimated revenue from the secondary recovery project is \$78.4 million at \$70/bbl after royalty and taxes.

Warren America requests that its wells in the Wasson, North (San Andres) Field be transferred into the Wasson Field or in the alternative to consolidate the Wasson, North (San Andres) Field into the Wasson Field. It was determined by Commission Staff that it is preferable to consolidate the fields rather than transferring all wells, leaving two wells in the Wasson, North (San Andres) Field. The Wasson, North (San Andres) Field was discovered in 1974 at a depth of 5,265 feet. The field has produced 401,960 BO. There are seven wells in the field, three producing wells, two injection wells and two shut-in wells. Five of the wells are located within the North Wasson waterflood Unit. Cross section data indicates the wells in the Wasson and Wasson, North (San Andres) Field produce from the identical productive interval, the San Andres Formation. Wells from both fields produce adjacent to each other and there is no geographic separation between the wells.

#### **FINDINGS OF FACT**

1. Notice of this hearing was sent to all operators and royalty interest owners within the proposed unit and to offset operators and mineral owners of unleased tracts. Notice was also published in *The Denver City Press*, a newspaper of general circulation in Yoakum County, for four consecutive weeks beginning October 11, 2009. There were no protests to the application.
2. The proposed unit consists of 12 tracts which contain a total of 880 acres.
3. The unitized formation is the subsurface portion of the Unit Area commonly known as the San Andres reservoir. The formation is described as the interval from 5,120 feet to 5,550 feet on the log of the Warren American Oil Company Sullivan No. 1, (API No. 42-501-31606) located in the J. H. Gibson Survey, Section 567, Block D, Yoakum County, Texas.
4. Secondary recovery operations will result in the recovery of an estimated 1.57 MMBO which would otherwise go unrecovered.
5. The cost to implement the project does not exceed the value of additional reserves to be recovered.
6. The participation formula is based on equal 25% weights to current producing rate, estimated ultimate recovery, useable wells and porosity-acre-feet.
7. The secondary recovery project will not be successful unless the area is unitized.

8. The secondary recovery program will use produced salt water from two reactivated producing wells completed in the Lower San Andres formation.
9. The agreement was voluntarily executed by all parties affixing their signatures thereto and no person has been compelled or required to enter into the agreement. The unit agreement binds only those persons who have executed it, their heirs, successors, assigns and legal representatives. The rights of all owners of interests in the field will be protected under the operation of the unit, regardless of whether an owner signed the unit agreement.
10. The owners of interest in the oil and gas under each tract of land within the area reasonably defined by development have been given an opportunity to enter into the unit on the same yardstick basis as owners of interest in the oil and gas under the other tracts in the unit.
11. The proposed injection program will move hydrocarbons across lease lines, and unitization is necessary in order to protect the correlative rights of the various interest owners.
12. The unitization agreement is necessary to accomplish the purposes of establishing a unit to effect secondary recovery operations and to operate the necessary cooperative facilities. Other available or existing methods or facilities for secondary recovery operations are inadequate for the purpose of secondary recovery.
13. The unit agreement does not provide, either directly or indirectly, for the cooperative refining or marketing of crude petroleum, distillate, condensate, or gas, or any by-product thereof.
14. The unit agreement is subject to all valid orders, rules and regulations of the Railroad Commission.
15. The unit agreement contains no provision regarding field rules, nor does it limit the amount of production of oil or gas from the unitized area. The unit agreement does not release the operator from his obligation to reasonably develop lands or leases as a whole.
16. The unit agreement is a voluntary agreement entered into for the purpose of conducting secondary recovery operations.
17. The unit agreement does not provide for the location of wells.
18. There are no State lands in the unit.

19. The reservoir described in the unit agreement is a suitable reservoir for the proposed secondary recovery operation.
20. The unit agreement contains only the acreage reasonably necessary to accomplish the proposed secondary recovery project.
21. The unit agreement has been ratified by 100% of the working interest ownership and over 88% of the royalty interest ownership.
22. On tracts where 100% sign-up is not attained, the applicant will continue to use existing lease production facilities to account for production from that tract.
23. Warren America will only convert the last or only producing well on tracts it has 100% royalty sign up or has drilled and completed a new producing well on tracts it does not have 100% royalty sign up.
  1. Tracts 2, 9 and 11 have or will have 100% royalty sign up and will convert existing wells to injectors.
  2. Tracts 7, 8 and 11 will have new wells drilled and completed prior to converting existing wells to injectors.
24. The Wasson, North (San Andres) Field should be consolidated into the Wasson Field.
  - a. The Wasson, North (San Andres) Field was discovered in 1974 at a depth of 5,265 feet. The field has produced 401,960 BO.
  - b. There are seven wells in the Wasson, North (San Andres) Field, three producing wells, two injection wells and two shut-in wells. Five of the wells are located within the North Wasson waterflood Unit.
  - c. Cross section data indicates the wells in the Wasson and Wasson, North (San Andres) Field produce from the identical productive interval, the San Andres Formation. Wells from both fields produce adjacent to each other and there is no geographic separation between the wells.

**CONCLUSIONS OF LAW**

1. Proper notice was given to all persons legally entitled to notice.
2. All things have occurred or have been accomplished that are necessary to give the Commission jurisdiction in this matter.
3. Applicant's proposed secondary recovery project satisfies all of the requirements set out in TEX. NAT. RES. CODE ANN. §§101.001 et seq. (Vernon 1993).
4. Approval of the proposed unit agreement and secondary recovery operations is in the public interest and is necessary to prevent waste and to promote the conservation of oil or gas or both.

**EXAMINERS' RECOMMENDATION**

Based on the above findings of fact and conclusions of law, the examiners recommend approval of the proposed North Wasson Unit and secondary recovery operations project as set out in the attached order and the consolidation of the Wasson, North (San Andres) Field into the Wasson Field.

Respectfully submitted,

Andres J. Trevino  
Technical Examiner

Mark Helmueller  
Hearings Examiner