

THE APPLICATION OF SUNDOWN ENERGY LP TO CONSIDER UNITIZATION AND SECONDARY RECOVERY AUTHORITY FOR THE SHANNON WATERFLOOD UNIT IN THE SHANNON (SAN ANDRES) FIELD, CROCKETT COUNTY, TEXAS

HEARD BY: Andres J. Trevino P.E., Technical Examiner
James M. Doherty, Hearings Examiner

DATE OF HEARING: April 15, 2011

APPEARANCES:

George Neale
Rick Johnston
Ross Pearson
Cameron Rice

REPRESENTING:

Sundown Energy LP

EXAMINERS' REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Sundown Energy LP requests Commission authority for unitization of the Shannon Waterflood Unit and approval of secondary recovery operations on the Unit in the Shannon (San Andres) Field.

This application was unopposed and the examiners recommend approval.

DISCUSSION OF THE EVIDENCE

The Shannon (San Andres) Field was discovered in 1943 at an approximate depth of 2,406 feet. Production peaked in 1962 with a monthly production rate of 28,000 BO per month. At the time there were approximately 58 producing wells in the Unit area. Current production is approximately 200 BO per month from the 2 remaining active wells in the Unit area. The vast majority of the wells are shut-in with 14(b)(2) extensions. Sundown hopes to re-establish production by waterflooding the Unit.

The area proposed for the subject unitization covers acreage in a distinct but separate porosity development and oil accumulation located in the northeast corner of the field. The majority of the productive reservoir in this isolated portion of the field is located within the Unit boundary. The reservoir limits of the isolated portion under the Unit are well defined and are 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 wells is 2,841,540 BO. Remaining primary production from wells on the unit is estimated to be 188,000 BO.

The unitized formation is the Grayburg San Andres formation that has a gentle structure with a slight high in the center of the Unit. The proposed Grayburg San Andres interval contains several separate porosity zones within the interval. The formation is described as a dolomitized carbonate formation encountered in the interval from 2,109 feet to 2,550 feet on the Schlumberger Sonic-Gamma Ray log of the Pennzoil Shannon No. 7, (API No. 42-105-10249) located in the J. Edwards Survey, Block FF, Section 6, Crockett County, Texas.

Average porosity is 14% and average water saturation is 15%. The initial reservoir pressure was 800 psi and current pressure beneath the unit area is less than 100 psi. The oil had an initial GOR of 200 cuft/bbl causing reservoir pressure to drop rapidly after production began. Sundown will use a line drive waterflood pattern to recover the remaining reserves. Sundown anticipates a 1:1 secondary to primary recovery, however due to heterogeneity in the reservoir the secondary to primary recovery could be lower at a ratio of .75:1. The anticipated waterflood program will consist of 44 producing wells and 36 injection wells. Water will be supplied from existing saltwater production. The majority of the injection wells will be converted oil wells. Two plugged wells will be reentered and converted to injection wells and one new injection well may be drilled.

The proposed Shannon Waterflood Unit consists of 11 tracts which contain a total of 2,199 acres. The tract participation formula is based on the sum of 80% of the Tract's actual cumulative oil production prior to 2009, plus 5% of the Tract's actual oil produced during 2008, plus 5% of the Tract's ratio of surface acres, plus 10% of the Tract's ratio of the useable wellbore(s). The Unit Agreement has been ratified by over 77.4% 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 \$2,750,000. Secondary reserves are estimated to be 2,730,000 BO. Estimated revenue from the secondary recovery project is \$150 million at \$71/bbl.

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 *Ozona Stockman*, a newspaper of general circulation in Crockett County, for four consecutive weeks beginning March 9, 2011. There were no protests to the application.
2. The proposed unit consists of 11 tracts which contain a total of 2,199 acres.
3. The unitized formation is the subsurface portion of the Unit Area commonly

known as the Grayburg San Andres reservoir. The formation is described as the interval from 2,109 feet to 2,550 feet on the Schlumberger Sonic-Gamma Ray log of the Pennzoil Shannon No. 7, (API No. 42-105-10249) located in the J. Edwards Survey, Block FF, Section 6, Crockett County, Texas.

4. Secondary recovery operations will result in the recovery of an estimated 2.7 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 the sum of 80% of the Tract's actual cumulative oil production prior to 2009, plus 5% of the Tract's actual oil produced during 2008, plus 5% of the Tract's ratio of surface acres, plus 10% of the Tract's ratio of the useable wellbore(s).
7. The secondary recovery project will not be successful unless the area is unitized.
8. The secondary recovery program will use produced saltwater from the Grayburg 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 77.4% 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.

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 Shannon Waterflood Unit and secondary recovery operations project as set out in the attached order.

Respectfully submitted,

Andres J. Trevino
Technical Examiner

James M. Doherty
Hearings Examiner