

THE APPLICATION OF CHI OPERATING, INC. TO CONSIDER UNITIZATION AND SECONDARY RECOVERY AUTHORITY FOR THE POST MONTGOMERY LOWER CLEARFORK WATERFLOOD UNIT, LINKER (CLEAR FORK) FIELD, HOCKLEY COUNTY, TEXAS

HEARD BY: Richard D. Atkins, P.E. - Technical Examiner
Gene Montes - Legal Examiner

DATE OF HEARING: August 11, 2011

APPEARANCES:

REPRESENTING:

APPLICANT:

Clark Jobe
Gary Womack
John Qualls
David Shatzer

Chi Operating, Inc.

PROTESTANT:

Jim Cowden
Horace S. Wallace, Jr.
Kay Wallace Sanders

Horace S. Wallace, Jr. and
Kay Wallace Sanders

EXAMINERS' REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Chi Operating, Inc. ("Chi") requests Commission authority for unitization of the Post Montgomery Lower Clearfork Waterflood Unit and approval of secondary recovery operations on the Unit. Since there were several returned hearing notices, Chi published notice of the subject application in the *Levelland & Hockley County News-Press*, a newspaper of general circulation in Hockley County, for four consecutive weeks beginning on July 13, 2011.

The application was protested by several mineral owners in Tract No. 9, who believed that unit participation based solely on surface acres was not reasonable. After the call of the hearing, the protestants reached an agreement with Chi and the protests

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were withdrawn. The application was then unopposed and the examiners recommend approval.

DISCUSSION OF THE EVIDENCE

The Linker (Clear Fork) Field was discovered in April 1961 at an average depth of 7,200 feet. There are 69 producing oil wells and eight operators carried on the proration schedule. Field Rules provide for 440'-880' well spacing, 42.5 acre oil units with optional 21.25 acre density. The top allowable is a MER allowable of 250 BOPD with an allowable gas-oil ratio of 2,000 cubic feet per barrel and a casinghead gas limit of 500 MCFGPD. Cumulative production from the field through July 2011 is 5.7 MMBO and 1.5 BCFG.

The unitized formation is the subsurface portion of the Unit Area commonly known as the Lower Clearfork formation between the subsurface depths of 6,838 feet and 7,776 feet as shown on the log of the Chi Operating, Inc. - Et Al "6" Lease, Well No. 1 (API No. 42-219-36961), Labor 6, League 27, Hood County School Land Survey, A-149, Hockley County, Texas.

The proposed Post Montgomery Lower Clearfork Waterflood Unit consists of 15 tracts which contain 1,378 acres. The productive interval is located on the Permian Clearfork Shelf Margin which is a dolomitic stratigraphic trap that has a solution gas drive as the primary drive mechanism. The proposed unit contains a part of the productive portions of the Lower Clearfork formation, as demonstrated by a cross section, structure map and net pay isopach map submitted by Chi.

Chi proposes to initially implement a waterflood by converting three producing wells to injection and drilling one additional injection well on the unit. Chi plans to inject 2,000 BPD of produced saltwater and additional makeup saltwater from a Santa Rosa formation water source well to be drilled at a later date. The Santa Rosa formation is located at an average depth of 1,500 feet and contains brackish water.

Chi estimates that secondary recovery will be equal to 100% of primary recovery or approximately 1.7 MMBO. The total cost to implement the secondary recovery project is expected to be \$6.8 million. The projected net 10% discounted working interest income is \$30.4 million, resulting in a return on investment of 4.5 to 1. This calculation is based on an oil price of \$94 per barrel.

The participation formula for each tract is based on 100% surface acres. At the time of the hearing, 100% of the working interest ownership and 90% of the mineral interest ownership had signed the unit agreement. Since there are 46% of the mineral interest that is unsigned in Tract 9, to avoid a protest, Chi has agreed to measure the production from Tract 9 with a separate tank battery or positive displacement meter. In addition, Chi has agreed that the existing four producing wells on Tract 9 will not be converted to injection until after August 11, 2016. There are no state owned lands in the proposed unit.

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FINDINGS OF FACT

1. Notice of this hearing was sent to all operators and royalty interest owners within and adjacent to the proposed unit. The subject application was published in the *Levelland & Hockley County News-Press*, a newspaper of general circulation in Hockley County, for four consecutive weeks beginning on July 13, 2011.
2. The proposed Post Montgomery Lower Clearfork Waterflood Unit consists of 15 tracts which contain 1,378 acres.
3. The unitized formation is the subsurface portion of the Unit Area commonly known as the Lower Clearfork formation between the subsurface depths of 6,838 feet and 7,776 feet as shown on the log of the Chi Operating, Inc. - Et Al "6" Lease, Well No. 1.
4. The productive interval is located on the Permian Clearfork Shelf Margin which is a dolomitic stratigraphic trap that has a solution gas drive as the primary drive mechanism.
5. At the time of the hearing, 100% of the working interest ownership and 90% of the mineral interest ownership had signed the unit agreement.
6. Secondary recovery operations are expected to result in the recovery of an estimated 1.7 MMBO which would otherwise go unrecovered.
7. The total cost to implement the secondary recovery project is expected to be \$6.8 million. The projected net 10% discounted working interest income is \$30.4 million, resulting in a return on investment of 4.5 to 1. The cost does not exceed the value of additional reserves to be recovered.
8. The participation formula for each tract is based on 100% surface acres.
9. The secondary recovery project will not be successful unless the area is unitized.
10. Chi proposes to initially implement a waterflood by converting three producing wells to injection and drilling one additional injection well on the unit. Chi plans to inject 2,000 BPD of produced saltwater and additional makeup saltwater from a Santa Rosa formation water source well to be drilled at a later date.
11. The agreement was voluntarily executed by all parties affixing their signatures thereto and no person has been compelled or required to enter

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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.

12. 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.
13. 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.
14. The unitization agreement is necessary to accomplish the purposes of establishing a unit to effect secondary recovery operations for water injection and to operate cooperative facilities necessary thereto. Other available or existing methods or facilities for secondary recovery operations are inadequate for the purpose of secondary recovery.
15. 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.
16. The unit agreement is subject to all valid orders, rules and regulations of the Railroad Commission.
17. 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.
18. The unit agreement is a voluntary agreement entered into for the purpose of conducting secondary recovery operations.
19. The unit agreement does not provide for the location of wells.
20. There are no state owned lands in the proposed unit.
21. The unit agreement is in the interest of public welfare as being reasonably necessary to prevent waste and to promote conservation.
22. The reservoir described in the unit agreement is identified as a single reservoir for Commission purposes and is a suitable reservoir for a water

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injection secondary recovery operation.

23. The unit agreement contains only the acreage reasonably necessary to accomplish the proposed secondary recovery project.
24. Since there are 46% of the mineral interest that is unsigned in Tract 9, to avoid a protest, Chi has agreed to measure the production from Tract 9 with a separate tank battery or positive displacement meter. In addition, Chi has agreed that the existing four producing wells on Tract 9 will not be converted to injection until after August 11, 2016.

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.
4. Approval of the proposed unit agreement for 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 Post Montgomery Lower Clearfork Waterflood Unit and secondary recovery operations, as set out in the attached order.

Respectfully submitted,

Gene Montes
Legal Examiner

Richard D. Atkins, P.E.
Technical Examiner