

**STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
SUPERVISOR OF WELLS**

THE PETITION OF SUMMIT PETROLEUM CORPORATION )  
FOR AN ORDER FROM THE SUPERVISOR OF WELLS )  
APPROVING A PLAN OF UNITIZATION FOR PRESSURE )  
MAINTENANCE AND ENHANCED AND/OR SECONDARY ) Order NO. 15-2007  
RECOVERY OF OIL, GAS, AND RELATED )  
HYDROCARBONS, AND ABROGATING EXISTING )  
SPACING ORDERS AND RULES IN THE WILLIAMS BEREA )  
FIELD. )

**OPINION AND ORDER**

This case involves the Petition of Summit Petroleum Corporation (Petitioner). The Petitioner is requesting (i) approval of an operation of a portion of the Williams Berea Field (proposed Unit Area), pursuant to Part 617, Unitization, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); (ii) approval of a secondary recovery or pressure maintenance operation pursuant to Section 61506(i), Part 615, Supervisor of Wells, of the NREPA and R 324.612; and (iii) approval to operate the proposed Unit Area as an exception to the applicable spacing provisions of Part 615 of the NREPA, and its administrative rules. The proposed Unit Area consists of approximately 2,080 acres, including the following:

Williams Township, Bay County, MI, T14N, R3E  
Section 5: NW 1/4, W 1/2 of NE 1/4, N 1/2 of SW 1/4, NW 1/4 of SE 1/4  
Section 6: N 1/2, N 1/2 of SW 1/4, N 1/2 of SE 1/4

Beaver Township, Bay County, MI, T15N, R3E  
Section 31: SW 1/4 of NW 1/4, S 1/2 of SW 1/4, NW 1/4 of SW 1/4, SW 1/4 of SE 1/4

Midland Township, Midland County, MI, T14N, R2E  
Section 1: E 1/2 of NE 1/4, N 1/2 of NW 1/4

East Larkin Township, Midland County, MI, T15N, R2E  
Section 26: SE 1/4 of SW 1/4  
Section 35: NE 1/4, E 1/2 of NW 1/4, N 1/2 of SE 1/4  
Section 36: NW 1/4 of NW 1/4, S 1/2 of NW 1/4, S 1/2 of NE 1/4, S 1/2.

### **JURISDICTION**

The development of oil and gas in this state is regulated under Part 615, Supervisor of Wells; and Part 617, Unitization; of the NREPA, MCL 324.61501, *et seq.* and MCL 324.61701, *et seq.*, respectively. The purpose of Parts 615 and 617 is to ensure the orderly development and production of the oil and gas resources of this state, with a view to the ultimate recovery of the maximum production of these natural resources. MCL 324.61502. To the end of maximizing recovery, the Supervisor of Wells (Supervisor) regulates secondary recovery methods for oil and gas, including the introduction of substances into producing formations, for purposes of enhancing production. MCL 324.61506(i). A person proposing secondary recovery by injection of a fluid into a producing formation must file a petition for a public evidentiary hearing. 1996 MR 9, R 324.612. The evidentiary hearing is governed by the applicable provisions of the Administrative Procedures Act, 1969 PA 306, as amended, MCL 24.201, *et seq.* See 1996 MR 9, R 324.1203. The evidentiary hearing in this matter was held on September 18, 2007.

### **FINDINGS OF FACT**

Petitioner specifically requests that the Supervisor issue an Order allowing Petitioner to inject gas, brine, and other approved substances into the Berea Sandstone Formation, the productive zone, for purposes of secondary recovery and/or pressure maintenance operations and exempt the proposed Unit Area from the applicable spacing and proration rules and orders.

In support of its case, the Petitioner offered the testimony of J. Scott Huber, petroleum engineer; and Michael Covington, land man. Mr. Huber was recognized as an expert in petroleum engineering.

The Administrative Law Judge determined the Notice of Hearing was properly served and published in the local newspaper. Publication in the Michigan Oil & Gas News was not timely under parts 615 and 617, however, Petitioner was found to be in substantial compliance with the overall notice requirements. R 324.1209. No answers were filed; however, a request for a change of venue was received. As there are no

provisions for change of venue under the secondary recovery and unitization regulations, the request was denied. Therefore, Petitioner is the only party in this case. The Supervisor designated the hearing to be an evidentiary hearing pursuant to R 324.1205(1)(b) and directed evidence be presented in the form of oral testimony.

#### I. Unitization

Mr. Covington testified all mineral interests in the proposed Unit Area are subject to valid Oil and Gas Leases and all Oil and Gas Leases are owned by Petitioner. Mr. Covington stated Petitioner's Plan of Unitization (Exhibit R) constitutes a plan of unit operations containing all of the required terms and conditions as set forth in subsections 61705(a)-(j) of Part 617 of the NREPA, and expressly provides for the unitized operation of the proposed Unit Area for purposes of secondary recovery and pressure maintenance operations. The Plan of Unitization has been ratified by owners whose interests total in excess of 90 percent of all production from the proposed Unit Area.

Petitioner made diligent attempts to contact owners, including mailing of the Plan of Unitization. No objections to the Petition or Plan or Unitization were received by the Supervisor from owners within the proposed Unit Area.

I find that Petitioner qualifies to be named Unit Operator and has obtained sufficient approval to support entry of a final order approving unit operations pursuant to Part 617 of the NREPA.

#### II. Unit Area

Based on available well control, Mr. Huber prepared Exhibit H, a Berea structure contour map that also depicted the reservoir quality of the field. Mr. Huber testified the North Williams Berea Field is entirely contained within the proposed Unit Area and indicated there may be a stratigraphic element to the trapping mechanism.

Mr. Huber testified Petitioner plans to conduct unitized operations within a Unitized Formation described as the stratigraphic equivalent of that portion of the Berea Sandstone Formation encountered in the interval from 2,373 feet measured depth to 2,460 feet measured depth in the Eva Mieske 2-36 well (Permit No. 36046) located in Larkins Township, Section 36, T15N, R2E, Midland County Michigan.

I find the Unitized Formation as proposed by Petitioner is reasonable and appropriate and should be approved. I find the boundaries of the proposed Unit Area are appropriate. Productive portions of the reservoir underlie each tract within the proposed Unit Area, and all productive portions of the reservoir are within the proposed Unit Area.

### III. Secondary Recovery

Mr. Huber testified 68 wells were originally drilled in the proposed Unit Area, of which 43 are producing and 17 were plugged. Total primary recovery is 0.941 million stock tank barrels of oil (MMSTB) (Exhibit E). Mr. Huber testified that a few thousand barrels of oil remain to be recovered with primary production operations. Petitioner believes significantly more oil will be recovered as a result of water injection. Mr. Huber's opinion was based upon studies conducted by Petitioner and prior operators in the field, along with the positive results of a water flood at the nearby Williams Berea Unit operated by Muskegon Development Company. Petitioner initially proposes to convert and inject Marshall Sandstone Formation water into nine wells for the Phase I project and convert and inject into eight additional wells for Phase II. Petitioner expects to inject between 100 and 150 barrels of water per day per injection well during a period of 6 to 12 months. After the field stabilizes and oil production increases, then each well will be maximized to the greatest injectivity but not beyond formation fracture pressure. Mr. Huber estimated that water injection in the proposed Unit Area would result in incremental oil recovery of 0.871 MMSTB. Mr. Huber's secondary recovery production forecast and estimated economics indicate the project will be profitable (Exhibit Q). He estimated the profit after taxes at \$15.0 million (discounted at 10%) for both phases of the project.

Mr. Huber indicated no natural gas will be produced for sale from the unitized operations. All gas recovered in the production operation will be utilized for artificial lift, fluid separations, and fuel for fired-vessels. Mr. Huber stated that the source of water for injection was the Marshall Sandstone Formation. Oil production from the proposed

Unit Area will initially be handled at the Oil Handling Facility (OHF) located in Larkins Township, Section 35, T15N, R2E, Midland County, Michigan.

Based on Petitioner's analysis, there is evidence of significant amounts of oil remaining in the reservoir. I find the testimony indicates the proposed Unit Area contains accumulations of hydrocarbons that have not been recovered by primary production of the wells in the field, but may be recovered by secondary recovery operations conducted as a part of a unitized operation. I find the estimated additional cost of unitized operations will not exceed the value of the additional hydrocarbons recovered, and the unitization requested is reasonably necessary to substantially increase recovery of oil from the proposed Unit Area. The Petitioner requests permission to inject at pressures up to formations fracture gradient. I find that it is premature to authorize injection at the requested pressure without first demonstrating to the Supervisor the wells in the field have been properly plugged and that the confining zone fracture gradient exceeds the producing zone fracture gradient.

The Plan of Unitization allocates unit production among the various tracts comprising the proposed Unit Area based on the percentage of each tract's mineral acres in the unit in proportion to the total number of mineral acres in the Unit Area. It was Mr. Huber's opinion that the reservoir is fairly uniform in terms of reservoir quality throughout the field and that allocation by net mineral acreage represents a reasonable and equitable method of unit production.

I find the allocation of production to the separately owned tracts is fair, reasonable, and equitable as required by Section 61705 of Part 617 of the NREPA.

I find the type of operations contemplated by Petitioner are feasible, will prevent underground waste by recovering oil not otherwise recoverable, and will protect correlative rights. I find abrogation of the existing well location and proration requirements is necessary to implement the Plan of Unitization and proceed with unitized operations, except no well shall be completed in the Unitized Formation at a location closer than 330 feet from the outside boundary of the proposed Unit Area.

### CONCLUSIONS OF LAW

Based on the findings of fact, I conclude, as a matter of law:

1. The applicable spacing and well location requirements for the proposed Unit Area are established by existing administrative rules under Part 615 or its predecessor statute.

2. The Supervisor shall issue an order providing for the unit operation of a unit area if he or she finds all of the following:

(a) That the unitization requested is reasonably necessary to substantially increase the ultimate recovery of oil and gas from the unit area;

(b) That the type of operations contemplated by the plan are feasible, will prevent waste, and will protect correlative rights.

(c) That the estimated additional cost of conducting such operations will not exceed the value of the additional oil and gas so recovered. MCL 324.61704(4).

3. The Supervisor's Order may be declared effective if the plan of unitization has been approved by those persons who under the Supervisor's Order will be entitled to at least 90% of all production from the unit area or the proceeds of that production. MCL 324.61706.

4. The Supervisor may regulate the secondary recovery methods of oil and gas, including pulling or creating a vacuum and the introduction of gas, air, water, and other substances into the producing formations. MCL 324.61506(i).

5. A person desiring to inject water, gas, or other fluid into a producing formation or use other technology for the purpose of increasing the ultimate recovery of hydrocarbons from a reservoir shall file a petition for hearing. 1996 MR 9, R 324.612(1).

6. The operator of a secondary recovery project shall keep accurate records of all oil, gas, and brine produced, volumes of fluids injected, and injection pressures. The operator shall file reports of the data and other data as may be required with the Supervisor at regular intervals, as specified. 1996 MR 9, R 324.612(2).

7. The Supervisor has jurisdiction over the subject matter and the persons interested therein.

8. Due notice of the time, place, and purpose of the hearing was given as required by law, and all interested persons were afforded an opportunity to be heard. 1996 MR 9, R 324.1204.

#### **DETERMINATION AND ORDER**

Based on the Findings of Fact and Conclusions of Law, the Supervisor determines the proposed unitization is necessary to prevent waste and to maximize the recovery of hydrocarbons from the proposed Unit Area.

NOW, THEREFORE, IT IS ORDERED:

1. The Petition of Summit Petroleum Corporation is granted, and the proposed Unit Area is created in accordance with, and subject to, this Order and the provisions of the Plan of Unitization, which is hereby incorporated by reference. The proposed Unit Area shall hereafter be known as the North Williams Berea Unit.

2. Summit Petroleum Corporation is appointed Unit Operator. Summit Petroleum Corporation is a proper applicant, as an interested lessee within the North Williams Berea Unit Area, for an Order of Unitization.

3. The North Williams Berea Unit Area is described as:

Williams Township, Bay County, MI, T14N, R3E

Section 5: NW 1/4, W 1/2 of NE 1/4, N 1/2 of SW 1/4, NW 1/4 of SE 1/4

Section 6: N 1/2, N 1/2 of SW 1/4, N 1/2 of SE 1/4

Beaver Township, Bay County, MI, T15N, R3E

Section 31: SW 1/4 of NW 1/4, S 1/2 of SW 1/4, NW 1/4 of SW 1/4, SW 1/4 of SE 1/4

Midland Township, Midland County, MI, T14N, R2E

Section 1: E 1/2 of NE 1/4, N 1/2 of NW 1/4

East Larkin Township, Midland County, MI, T15N, R2E

Section 26: SE 1/4 of SW 1/4

Section 35: NE 1/4, E 1/2 of NW 1/4, N 1/2 of SE 1/4

Section 36: NW 1/4 of NW 1/4, S 1/2 of NW 1/4, S 1/2 of NE 1/4, S 1/2.

4. The Unitized Formation is described as:

The stratigraphic equivalent of that portion of the Berea Sandstone Formation encountered in the interval from 2,373 feet measured depth to 2,460 feet measured depth in the Eva Mieske 2-36 well (Permit No. 36046) located in Larkins Township, Section 36, T15N, R2E, Midland County Michigan.

5. Summit Petroleum Corporation shall notify the Supervisor at least 30 days prior to the commencement of injection operations, and at least 30 days prior to the anticipated date of abandonment of injection operations. Petitioner shall comply with the filing requirements of R 324.610, R 324.612, and R 324.806 of the administrative rules of Part 615 of the NREPA and shall obtain such approvals as are necessary from the Department of Environmental Quality.

6. Each tract within the North Williams Berea Unit Area shall participate in the unit production and other benefits and burdens of unit operations in accordance with the Plan of Unitization.

7. Operation of the North Williams Berea Unit Area shall be conducted exclusive of and as an exception to all applicable spacing and proration orders and rules, except no well may be completed in the Unitized Formation at a location closer than 330 feet from the outside boundaries of the North Williams Berea Unit Area. Summit Petroleum Corporation is authorized to produce wells on the Unit Area at rates that result in the maximum efficient recovery of hydrocarbons. All other parts of the administrative rules of Part 615 of the NREPA shall be adhered to.

8. The unitized operations shall initially be accomplished by the injection of water from the Marshall Sandstone Formation or produced brine. Other substances may only be injected with written approval from the Supervisor.

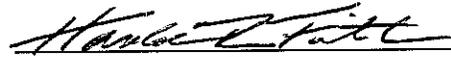
9. Surface injection pressure shall not exceed 688 psig unless written approval is obtained from the Supervisor.

10. The Plan of Unitization, which constitutes the plan for unit operations, is hereby approved; and unit operations thereunder may be commenced as of the effective date determined by the Unit Operator consistent with Article 16 of the Plan of Unitization. Cessation of the unit operations shall be in accordance with the Plan of Unitization and only with the written approval of the Supervisor.

11. The Supervisor retains continuing jurisdiction over the North Williams Berea Unit Area in order that the Supervisor may exercise such administrative control as is consistent with the powers and duties of the Supervisor, as established by Part 615 and Part 617 of the NREPA.

12. This Order shall be effective immediately.

Dated: Nov. 27, 2007



HAROLD R. FITCH  
ASSISTANT SUPERVISOR OF WELLS  
Office of Geological Survey  
P. O. Box 30256  
Lansing, MI 48909

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
SUPERVISOR OF WELLS

IN THE MATTER OF

THE PETITION OF SUMMIT PETROLEUM CORPORATION )  
FOR AN ORDER FROM THE SUPERVISOR OF WELLS )  
APPROVING A PLAN OF UNITIZATION FOR PRESSURE )  
MAINTENANCE AND ENHANCED AND/OR SECONDARY ) CAUSE NO. 15-2007  
RECOVERY OF OIL, GAS, AND RELATED HYDROCARBONS, )  
AND ABROGATING EXISTING SPACING AND PRORATION )  
ORDERS AND RULES IN THE WILLIAMS BEREA FIELD. )

**NOTICE OF HEARING**

Take notice that a hearing will be held before the Supervisor of Wells (Supervisor) in the city of Lansing, Michigan, on the EIGHTEENTH DAY OF SEPTEMBER (SEPTEMBER 18), 2007, BEGINNING AT 9:00 A.M., AT THE DEPARTMENT OF ENVIRONMENTAL QUALITY STEPHEN NISBET HEARING ROOM, ATRIUM LEVEL, SOUTH TOWER, CONSTITUTION HALL, 525 WEST ALLEGAN STREET, LANSING, MICHIGAN. The hearing will be conducted pursuant to Part 615, Supervisor of Wells; and Part 617, Unitization; of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), MCL 324.61501 et seq. and MCL 324.61701 et seq., respectively; the administrative rules, 1996 AACRS, 2001 MR 2, 2002 MR 23, R 324.101 et seq.; and the Administrative Procedures Act, 1969 PA 306, as amended, MCL 24.201 et seq.; MSA 3.560(101) et seq.

The purpose of this hearing is to consider the petition of Summit Petroleum Corporation (Petitioner), 1315 South Mission Road, Mt. Pleasant, Michigan 48858, requesting an order approving:

(A) A unitized operation and the adoption of a plan for unit operations pursuant to Section 61704(4), Part 617 of the NREPA, for the stratigraphic equivalent of that portion of the Berea Formation encountered in the interval from 2,373 feet to 2,460 feet in the Mieske 2-36 well (Permit No. 36046) located in the SE 1/4 of NE 1/4 of SE 1/4 of Section 36, T15N, R2E, Larkin Township, Midland County, Michigan. The proposed unit area for the Williams Berea Field is described as:

T14N, R3E, Williams Township, Bay County, Michigan  
Section 5: NW 1/4; W 1/2 of NE 1/4; N 1/2 of SW 1/4; NW 1/4 of SE 1/4  
Section 6: N 1/2; N 1/2 of SW 1/4; N 1/2 of SE 1/4

T15N, R3E, Beaver Township, Bay County, Michigan  
Section 31: SW 1/4 of NW 1/4; S 1/2 of SW 1/4; NW 1/4 of SW 1/4; SW 1/4 of SE 1/4

T14N, R2E, Midland Township, Midland County, Michigan  
Section 1: E 1/2 of NE 1/4; N 1/2 of NW 1/4

T15N, R2E, Larkin Township, Midland County, Michigan  
Section 26: SE 1/4 of SW 1/4  
Section 35: NE 1/4; E 1/2 of NW 1/4; N 1/2 of SE 1/4  
Section 36: NW 1/4 of NW 1/4; S 1/2 of NW 1/4; S 1/2 of NE 1/4; S 1/2

(B) A enhanced and/or secondary recovery or pressure maintenance operation pursuant to Section 61506(i), Part 615 of the NREPA and R 324.612. Petitioner proposes to conduct enhanced and/or secondary recovery and/or pressure maintenance operations by injecting gas, brine and other suitable substances into the described reservoir within the Williams Berea Field described in (A).

(C) The operation of the Williams Berea Field as an exception to the applicable spacing and proration provisions of Part 615 of the NREPA, and its administrative rules.

You can obtain a copy of the written petition by requesting one in writing from Mr. Michael Covington, 1315 South Mission Road, Mt. Pleasant, Michigan 48858, telephone number 989-513-1404.

Take note that if you wish to participate as a party in the hearing by presenting evidence or cross-examining witnesses, you shall prepare and mail or otherwise deliver to the Petitioner and Supervisor, not less than 5 days before the hearing date, an answer to the petition in the manner set forth in R 324.1204(6), or a protest as set forth in MCL 324.61704. Proof of mailing or delivering the answer or protest shall be filed with the Supervisor on or before the date of the hearing. The answer or protest shall state with specificity the interested person's position with regard to the petition. Failure to prepare and serve an answer or protest in a timely manner shall preclude you from presenting evidence or cross-examining witnesses at the hearing. If an answer or protest to the petition is not filed, the Supervisor may elect to consider the petition and enter an order without oral hearing. Mail the answer or protest to the petition to Mr. Michael Covington at the above address, and to the Supervisor in care of the Assistant Supervisor of Wells, Mr. Harold R. Fitch, OGS, P.O. Box 30256, Lansing, Michigan 48909-7756

Questions regarding this Notice of Hearing should be directed to Ms. Susan Maul, OGS, Michigan Department of Environmental Quality, P.O. Box 30256, Lansing, Michigan 48909-7756, telephone number 517-241-1552. Persons with disabilities needing accommodations for effective participation in this hearing should call or write Ms. Maul at least one week prior to the hearing date to request mobility, visual, hearing, or other assistance

Dated: *Aug. 13, 2007*

  
HAROLD R. FITCH  
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