

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

ORDER OF THE SUPERVISOR OF WELLS

THE PETITION OF COLUMBUS OIL AND GAS LLC,)
FOR AN ORDER FROM THE SUPERVISOR OF)
WELLS AMENDING ORDER NO. (A) 27-11-05 TO)
AUTHORIZE INJECTION OF NATURAL GAS LIQUIDS) CAUSE NO. 07-2014
FOR ENHANCED OIL RECOVERY IN PARTS OF)
SECTIONS 27, 29, 32, AND 34, AND ALL OF)
SECTION 28, CALVIN TOWNSHIP, CASS COUNTY,)
MICHIGAN; AND APPROVING OPERATION OF THE)
CALVIN 1 UNIT AREA AS AN EXCEPTION TO THE)
SPACING PROVISIONS OF ORDER NO. 1-1-84.)

OPINION AND ORDER

This case involves the Petition of Columbus Oil and Gas, LLC (Petitioner), for an amendment to Order No (A) 27-11-05 to expand the Calvin 1 Unit Area, Traverse Limestone Formation Enhanced Recovery unit from 720 to 1,760 acres. The original Calvin 1 Unit consisted of the E 1/2 of NE 1/4 of Section 32 and all of Section 33, T7S, R14W, Calvin Township, Cass County, Michigan.

The lands to be added consist of the W 1/2 of SW 1/4 of Section 27, all of Section 28, the SE 1/4 of Section 29, the NW 1/4 of NE 1/4 and N 1/2 of SW 1/4 of NE 1/4 of Section 32, and W 1/2 of SW 1/4 and NW 1/4 of NW 1/4 of Section 34, Calvin Township, Cass County, Michigan.

Jurisdiction

The development of oil and gas in this State is regulated under Part 615, Supervisor of Wells, of the Natural Resources and Environmental Protection Act (NREPA), MCL 324.61501 *et seq.* The purpose of Part 615 is to ensure the orderly development and production of the oil and gas resources of this State. MCL 324.61502. 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 June 9, 2014.

FINDINGS OF FACT

The Petition, as filed seeks an order of the Supervisor amending Order No. (A) 27-11-05 by adding the W 1/2 of SW 1/4 of Section 27, all of Section 28, the SE 1/4 of Section 29, the NW 1/4 of NE 1/4 and N 1/2 of SW 1/4 of NE 1/4 of Section 32, and W 1/2 of SW 1/4 and N 1/2 of NW 1/4 of NW 1/4 of Section 34, Calvin Township, Cass County, Michigan to the Unit Area. Mr. Lawrence's verified statement indicates the Petitioner has obtained oil and gas leases and ratifications of the Unitization Agreement from owners of mineral interests in the S 1/2 of NW 1/4 of NW 1/4 of Section 34, and wishes to include this acreage in the proposed expanded Unit Area.

The Administrative Law Judge determined the Notice of Hearing was properly served and published. No Answers to the Petition were filed. Therefore, the Petitioner is the only party in this matter. The Supervisor designated the hearing to be an evidentiary hearing pursuant to R 324.1205(1)(c) and directed substantive evidence be presented in the form of verified statements. In support of its case, the Petitioner offered the verified statement of Mr. A. Theodore Kuhns III, Chief Operating Officer, Columbus Oil and Gas LLC. At the request of the Supervisor, a supplemental verified statement from Mr. Charles U. Lawrence was submitted.

By Order No. (A) 27-11-05, Center Junction Corporation was authorized to inject natural gas liquids into the Traverse Limestone Formation for the purposes of enhanced oil recovery in the Calvin 1 Unit Area, consisting of the E 1/2 of NE 1/4 of Section 32 and all of Section 33, T7S, R14W, Calvin Township, Cass County, Michigan. The Calvin 1 Unit Area was approved as an exception to Order No. 1-1-84, which established 40-acre drilling units with a 330-foot setback from unit boundaries and a 600 foot separation between wells.

Mr. Kuhns states the Petitioner is the assignee of all of Center Junction Corporation's right, title, and interest in and to the Calvin 1 Unit Area and the Calvin 28

Field. By ratification of a voluntary Fourth Amendment to Unitization Agreement, the Petitioner has obtained the agreement of all owners of oil, gas, and other minerals, and oil and gas leasehold interests in the Calvin 28 pool to enlarge the Unit Area and operate the enlarged Calvin 1 Unit as a unitized enhanced oil recovery unit.

Mr. Kuhns states the Petitioner is the permittee of record and operator of leases for 46 productive wells in the entire 1,760-acre proposed Unit Area. These lands are underlain by the pool known as the "Calvin 28" pool described as:

That portion of the Devonian interval measured at a depth of 694 feet from the Litho Density Compensated Neutron Gamma Ray Log Run No. 1 in the Bowers 8-32 well (Permit No. 38113) down to a depth of 770 feet (Unitized Formation).

Twenty-seven of the productive wells in the Calvin 28 Pool are currently subject to Order No. 1-1-84. The Petitioner requests the Supervisor abrogate the 40-acre drilling units and the 600-foot setback provided for in Order No. 1-1-84 for the Proposed Expanded Unit. The Petitioner proposes a 330-foot setback from the boundary of the Unit Area. Mr. Kuhns states it is necessary to abrogate spacing and the 600-foot separation distance between wells in the Unit Area to eliminate waste and to provide for the maximum recovery of hydrocarbons from the Unit Area.

Mr. Kuhns' verified statement indicates the Petitioner is proposing to drill horizontal drain holes and convert some existing producing wells to injection wells within the Proposed Expanded Unit after a black oil test period has established a production history. The Petitioner's new dedicated injector wells are shown in its Plan of Development, attached as Exhibit C-1 to the Petition.

Mr. Kuhns states the Petitioner proposes to institute a VAPEX production process for the purpose of enhanced recovery of oil, gas, and related hydrocarbons. The VAPEX production process involves introduction of saturated solvent gasses into a heavy crude reservoir. The viscosity of the heavy oil is significantly reduced by the dissolution of these solvent gasses into the heavy oil, increasing its ability to flow. Mr. Kuhns indicates the injection will occur as part of the VAPEX cycle for all of the existing wellbores or new wells to be drilled. The Petitioner also requests authority from

the Supervisor to utilize such other appropriate substances including, but not limited to paraffin inhibitors, asphaltene inhibitors, water, CO₂, nitrogen, and other substances generally accepted as industry practices.

The Petitioner proposes to operate the Calvin 28 Pool and all of the existing wells, which lie within the Unit Area in concert for the purpose of enhancing production of oil, gas, and related hydrocarbons. In this regard, the Petitioner proposes to initiate VAPEX into the existing wells and to produce oil, gas, and related hydrocarbons from the existing wells (including the well used for injection) or new wells to be drilled as may be necessary.

Mr. Kuhns states the proceeds of production from the Calvin 1 Unit Area will be allocated among the owners of the oil, gas, and minerals, and oil and gas leasehold interests, in the Unit Area, in accordance with the voluntary Unitization Agreement, and the operative oil and gas leases. It is Mr. Kuhns' opinion that approval of the Petition is reasonably necessary to substantially increase the ultimate recovery of oil, gas, and related hydrocarbons from the Calvin 28 Pool, and the type of operations proposed are feasible, will prevent waste, and will protect correlative rights.

I find that adding the W 1/2 of SW 1/4 of Section 27, all of Section 28, the SE 1/4 of Section 29, the NW 1/4 of NE 1/4 and N 1/2 of SW 1/4 of NE 1/4 of Section 32, and W 1/2 of SW 1/4 and NW 1/4 of NW 1/4 of Section 34, Calvin Township, Cass County, Michigan will prevent waste and will protect correlative rights, and as such, the amendment of the Unit is approved.

CONCLUSIONS OF LAW

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

1. The applicable spacing for the Calvin 28 Pool is Order No. 1-1-84, Order No. (A) 27-11-05, and R 324.301. An exception to Order No. 1-1-84 and R 324.301 and an amendment to Order No. (A) 27-11-05 may be granted by the Supervisor after a hearing.
2. The Supervisor has jurisdiction of the subject matter and the persons interested therein.

3. 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, with respect to the determination made herein. 1996 MR 9, R 324.1204.

DETERMINATION AND ORDER

Based on the Findings of Fact and Conclusions of Law, the Supervisor of Wells determines that an amendment of Order No. (A) 27-11-05 will prevent waste.

NOW, THEREFORE, IT IS ORDERED:

1. Order No. (A) 27-11-05 is amended to expand the Calvin 1 Unit to include the following lands in Calvin Township, Cass County, Michigan:

- Section 27: W 1/2 of SW 1/4
- Section 28: All
- Section 29: SE 1/4
- Section 32: E 1/2 of NE 1/4, NW 1/4 of NE 1/4 and N 1/2 of SW 1/4 of NE 1/4
- Section 33: All
- Section 34: W 1/2 of SW 1/4 and NW 1/4 of NW 1/4

2. The unitized zone in the expanded area is described as:

That portion of the Devonian interval measured at a depth of 694 feet from the Litho Density Compensated Neutron Gamma Ray Log Run No. 1 in the Bowers 8-32 well, Permit No. 38113, down to a depth of 770 feet.

3. The Supervisor shall retain jurisdiction in this matter.

4. This Order shall be effective immediately.

Dated: August 26, 2014


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