

**STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
SUPERVISOR OF WELLS**

IN THE MATTER OF

THE PETITION OF MILLER ENERGY COMPANY II,)
LLC FOR AN ORDER OF THE SUPERVISOR OF)
WELLS APPROVING A PLAN OF UNITIZATION)
FOR ENHANCED OIL RECOVERY BY INJECTION)
OF WATER, AND SUCH OTHER APPROPRIATE)
SUBSTANCES AS MAY BE APPROVED, INTO) ORDER NO. 15-2023
THE DUNDEE FORMATION FOR THE)
ESSEXVILLE FIELD IN HAMPTON TOWNSHIP,)
BAY COUNTY, MICHIGAN; AND ABROGATING)
EXISTING SPACING AND PRORATION ORDERS)
AND RULES FOR SUCH POOL)

OPINION AND ORDER

This case involves the Petition of Miller Energy Company II, LLC (Miller Energy or Petitioner), requesting (a) approval of a unitization operation pursuant to Part 617, Unitization, of the Natural Resources and Environmental Protection Act, 1994 PA451, as amended (NREPA); (b) approval of an enhanced secondary recovery operation pursuant to Section 61506(i), Part 615, Supervisor of Wells, of the NREPA and R 324.612; and (c) approval to operate the proposed Unit Area as an exception to the applicable spacing provisions of Part 615 of the NREPA, its administrative rules, and any applicable spacing orders. The proposed Unit Area consists of approximately 2,016.07 acres, and is described as:

Section 7: NE/4 NW/4; S FRL/2 NW/4; NW/4 NE/4; S/2 NE/4;
N FRL/2 SW/4; and SE/4

Section 8: SW/4 NW/4; SW/4; and S/2 SE/4

Section 9: SW/4 SW/4

Section 15: NW/4 NW/4; S/2 NW/4; SW/4 NE/4; NW/4 SE/4; and
SW/4

Section 16: NW/4; NE/4; SE/4; N/2 SW/4; and SE/4 SW/4

Section 17: NE/4; N/2 NW/4; and SE/4 NW/4

Section 18: NE/4 NE/4

All in T14N-R6E, Hampton Township, Bay County, Michigan.

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.* 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 the various methods for recovery of oil and gas, including the unit operation of a pool and 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 substance into a producing formation must file a petition for public evidentiary hearing. 1996 AACS, R 324.612. Part 617 directs the Supervisor to issue an Order providing for unitization pursuant to a hearing if certain criteria are met. MCL 324.61704(4). Evidentiary hearings in these matters are governed by the applicable provisions of the Administrative Procedures Act, 1969 PA 306, as amended, MCL 24.201, *et seq.* See 1996 AACS, R 324.1203. The evidentiary hearing in this matter was held on March 12, 2024.

FINDINGS OF FACT

The Petitioner specifically requests that the Supervisor issue an Order forming the approximately 2,016-acre Unit Area as the Essexville Unit; and allowing the Petitioner to inject fresh and produced water and other approved substances into the Dundee Formation, the productive zone, for purposes of secondary and enhanced oil recovery; and exempting the proposed Unit Area from the applicable spacing and proration rules and orders.

The Administrative Law Judge determined that the Notice of Hearing was properly served and published. No answers were received in a timely manner. The Supervisor designated the hearing to be an uncontested evidentiary hearing pursuant to R 324.1205(1)(b) and directed evidence be presented at an in-person hearing.

In support of its case, the Petitioner offered the testimony of the following witnesses: Clinton Miller, Land Manager for Miller Energy; Kevin Jensen, consulting Petroleum Geologist; Andrew Maness, consulting Petroleum Engineer; and Joe Kelloff, Senior Vice President of Operations for Miller Energy, and a Petroleum Engineer. Mr. Jensen, Mr. Maness, and Mr. Kelloff were accepted as experts in their respective fields.

I. Unitization

Mr. Miller testified that the vast majority of the oil, gas, and mineral interests in the proposed unitized formation beneath the proposed Unit Area are subject to oil and gas leases owned by Miller Energy. He testified that as of the date of the hearing, 1.38% of the Unit's net revenue interest was currently unleased. Mr. Miller sponsored Exhibit 4, which shows unleased acreage in gray on page 1, and contains a list of the unleased owners on page 2. Mr. Miller testified that Petitioner is continuing to pursue leases within the unleased acreage.

Mr. Miller sponsored Exhibit 5 as the Petitioner's Plan of Unitization. He testified that it 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 purpose of enhanced oil recovery and pressure maintenance operations.

Mr. Miller sponsored Exhibit 6 showing that the Plan of Unitization has been approved and ratified by sufficient owners to meet the requirements of Part 617, specifically that approximately 82.4% of the Net Revenue Interest in the proposed unit have ratified the Plan of Unitization as of the date of the hearing.

I find that the Petitioner is qualified to be named Unit Operator and has obtained sufficient approval to support entry of a final order approving the Plan of Unitization and approving unit operations pursuant to Part 617 of the NREPA. I further find that the terms of the Petitioner's Plan of Unitization are fair, reasonable, and equitable.

II. Unit Area

Mr. Miller sponsored Exhibit 3, a map showing all of the proposed Unit Area, and the existing wells within the proposed unit that are subject to the Plan of Unitization. Exhibit 2 is a listing of all wells in the proposed unit.

Based on review of the available well data including driller's logs, well files, scout tickets and production records, Mr. Jensen prepared Exhibit 7, which consisted of 10 slides. Exhibit 7, slide 1 is a structure map of the Dundee reservoir at Essexville. Mr. Jensen testified that the Dundee formation in the Essexville Unit consists of three productive zones, which are referred to as the A Zone, the B Zone, and the Essex zone. Mr. Jensen testified that the proposed unit boundary encompasses the entire productive area of the Dundee Formation reservoir in the Essexville Field with a focus on the Essex formation, which is interpreted by Mr. Jensen to be the thickest and most productive zone. Mr. Jensen mapped the presence of each zone within the proposed unit (Exhibit 7, slides 4 through 7). In Mr. Jensen's opinion, the Essex zone is present in all of the lands in the proposed unit with observed oil shows in most of the existing wellbores.

Mr. Jensen testified that the Petitioner plans to conduct unitized operations within the unitized formation, specifically described in the Plan of Unitization (Exhibit 5) as the zones lying between the top and base of the Dundee Formation, an interval from 2,663 feet to 3,095 feet, or the stratigraphic equivalents encountered in the Wazbinsky 1-17 well (PN 36329), a vertically drilled well in the Essexville Field, located in the NW/4 SW/4 NE/4 of Section 17, Township 14 North, Range 6 East, Hampton Township, Bay County, Michigan.

I find the boundary of the proposed Unit Area and unitized formation as proposed by the Petitioner are appropriate and all productive portions of the reservoir are within the proposed Unit Area and should be approved.

III. Secondary Recovery

Mr. Miller testified that 42 wells that have been drilled into the Essexville Field that remain open. The Petitioner plans to use all 42 wells as the injectors and producers for the waterflood operation as shown on Exhibit 3. Mr. Maness testified that the total primary recovery has been a total cumulative production of 4.6 million barrels of oil (MMBO) from the Dundee (Exhibit 11). The Petitioner believes significantly more oil will be recovered as a result of water injection. The Petitioner proposes to inject fresh water and recycled brine from the unitized formation, and other appropriate substances approved by the Supervisor, into the field utilizing one or more of the existing wellbores. Mr. Maness testified that fresh water/recycled brine injection into the Essexville Unit would result in

incremental oil recovery of approximately 2.4 MMBO (Exhibit 12). Mr. Maness's enhanced oil recovery production forecast and estimated economics indicate the project will be profitable, with an estimated net cash flow of \$52.3 Million (Exhibit 13). Both Mr. Jensen and Mr. Maness testified that the Essexville Field has a gas-solution drive mechanism in the Dundee, which is favorable for waterflood response.

Mr. Jensen testified that in the 40-acre buffer area surrounding the Essexville Unit, there was 1 well drilled into the Dundee Formation. That well is interpreted to have only encountered the A Zone, and not the B Zone or the Essex zone, and was therefore omitted from the proposed unit. The only other wells within the proposed unit boundaries and in the 40-acre buffer are not active Dundee wells. Mr. Maness testified that in his professional opinion, that the proposed waterflood will economically recover oil which would not otherwise be produced and will prevent waste by reducing the amount of oil which will be left unrecoverable in the ground.

Based on the 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 an accumulation of hydrocarbons that will not be recovered by further primary production of the wells in the field but may be recovered by fresh water/recycled brine enhanced oil recovery operations conducted as part of the 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 ultimate recovery of oil from the proposed Unit Area.

The Plan of Unitization allocates unit production among the various tracts comprising the proposed Essexville Unit based on the acreage contributed by the tract, the cumulative production from the tract, and the production from the tract in the last 18 months (recent production). It is Mr. Maness's opinion that the tract factors represent each tract's fair, reasonable, and equitable share of future 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 further find the type of operations contemplated by the Petitioner are feasible, will prevent underground waste, and will protect correlative rights. I find abrogation of the existing spacing orders is necessary to implement the Plan of Unitization and proceed with unitized operations,

except no producing 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, well location, and proration requirements for the proposed Unit Area are established by Order 1945-01, pursuant to the Essexville Dundee Formation Pool. Exceptions to this order for this pool may be granted by the Supervisor.

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 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 production formations. MCL 32461506(i).

4. A person desiring to inject water, gas, or other fluids 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 AACCS, R 324.612(1).

5. 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 AACCS, R 324.612(2).

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

7. 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. 2015 AACCS, R 324.1204.

DETERMINATION AND ORDER

Based on the Findings of Fact and Conclusions of Law, the Supervisor determines that the proposed unitization and enhanced oil recovery project will prevent waste and maximize the ultimate recovery of hydrocarbons from the proposed Unit Area.

NOW, THEREFORE, IT IS ORDERED:

1. The Petition of Miller Energy Company II, LLC 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 be hereafter known as the Essexville Unit.

2. Order 1945-01 is abrogated for the Essexville Unit.

3. Miller Energy Company II, LLC is appointed Unit Operator.

4. The Essexville Unit is described as the NE/4 NW/4; S FRL/2 NW/4; NW/4 NE/4; S/2 NE/4; N FRL/2 SW/4; and SE/4 of Section 7; SW/4 NW/4; SW/4; and S/2 SE/4 of Section 8; SW/4 SW/4 of Section 9; NW/4 NW/4; S/2 NW/4; SW/4 NE/4; NW/4 SE/4; SW/4 of Section 15; NW/4; NE/4; SE/4; N/2 SW/4; and SE/4 SW/4 of Section 16; NE/4; N/2 NW/4; and SE/4 NW/4 of Section 17; and NE/4 NE/4 of Section 18, all in T14N-R6E, Hampton Township, Bay County, Michigan.

5. The Unitized Formation is described as the formations lying between the top and base of the Dundee Formation, an interval from 2,663 feet to 3,095 feet, or the stratigraphic equivalents encountered in the Wazbinsky 1-17 well (PN 36329), a vertically drilled well in the Essexville Field, located in the NW/4 SW/4 NE/4 of Section 17, Township 14 North, Range 6 East, Hampton Township, Bay County, Michigan.

6. Miller Energy Company II, LLC shall notify the Supervisor between 30 and 60 days prior to the commencement of injection operations, and between 30 and 60 days prior to the anticipated date of permanent cessation of injection operations. The 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 Environment, Great Lakes, and Energy.

7. Each tract within the Essexville Unit shall participate in the unit production and other benefits and burdens of unit operations in accordance with the Plan of Unitization.

8. Operation of the Essexville Unit shall be conducted as an exception to all applicable spacing 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 Essexville Unit. Miller Energy Company II, LLC 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.

9. The unitized operations shall initially be accomplished by the injection of fresh water and/or recycled brine. During recycling, whatever native natural gas is left in the unitized formation that becomes intermixed with water may be cycled into and out of the unitized formation. Other substances may only be injected with written approval 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, but subject to the Unit Operator determination of an effective date consistent with Article 26 of the Plan of Unitization. Cessation of 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 Essexville Unit 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 is effective immediately.



Dated: April 16, 2024

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