

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

IN THE MATTER OF:

THE PETITION OF CORE ENERGY, LLC, FOR AN )  
ORDER OF THE SUPERVISOR OF WELLS )  
APPROVING AN ENHANCED OIL RECOVERY )  
OPERATION, BY INJECTION OF CARBON DIOXIDE, )  
AND SUCH OTHER APPROPRIATE SUBSTANCES AS )  
MAY BE APPROVED, INTO THE GUELPH DOLOMITE- ) ORDER NO. 04-2023  
RUFF FORMATION, FOR THE CHESTER 19-24 POOL, )  
AND ABROGATING EXISTING SPACING AND )  
PRORATION ORDERS FOR SUCH POOL, IN PARTS )  
OF BAGLEY AND CHESTER TOWNSHIPS, OTSEGO )  
COUNTY, MICHIGAN )

**OPINION AND ORDER**

This case involves the Petition of Core Energy, LLC (Petitioner). The Petitioner is requesting (i) the abrogation of the Chester 19 Unit as established by Order No. 03-2018 (ii) approval of a new unit to be designated as the Chester 19-24 (proposed Unit Area), pursuant to Part 617, Unitization, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); (iii) the continued operation of the carbon dioxide injection well in the Chester 19 Unit and approval of an enhanced oil recovery operation in the Chester 19-24 Unit pursuant to Section 61506(i), Part 615, Supervisor of Wells, of the NREPA and R 324.612; and (iv) 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 166 acres and is described as the Southeast 1/4 of the Northeast fractional 1/4, the Northeast 1/4 of Southeast fractional 1/4, and the Northwest 1/4 of the Southeast fractional 1/4 of Section 24, Bagley Township, T30N, R3W; and the Southwest 1/4 of the Northwest fractional 1/4; the Northwest 1/4 of the Southwest fractional 1/4 of Section 19, Chester Township, T30N, R2W, Otsego 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.*, 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 enhanced oil recovery methods, 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 substance into a producing formation must file a petition for a public evidentiary hearing. 1996 AACRS, 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). 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 AACRS, R 324.1203. The evidentiary hearing in this matter was scheduled to be held on October 4, 2023.

### **FINDINGS OF FACT**

The Petitioner specifically requests that the Supervisor issue an Order allowing the Petitioner to inject carbon dioxide and other approved substances into the Guelph Dolomite/Ruff Formation, the productive zone, for purposes of enhanced oil recovery and exempts the proposed Unit Area from the applicable spacing and proration rules and orders.

The Supervisor determined the Notice of Hearing was properly served and published. No answers were received, and no one appeared at the hearing in opposition to the Petition. The Supervisor designated the hearing to be an evidentiary hearing pursuant to R 324.1205(2) and directed evidence be presented by verified statements.

In support of its case, the Petitioner offered the verified statements of the following witnesses: Kim Sanders, Land Manager; Rick Pardini, Petroleum Engineer; and Allen Modroo, Geophysicist.

### I. Unitization

Mr. Sanders testified that the Petitioner mailed the Notice of Hearing and a full copy of the Petition (except the list of interested parties) to all owners. No objections to the Petition or the Plan of Unitization were received from owners within the proposed Unit Area.

Mr. Sanders testified that all mineral interests in the proposed Unit Area (Exhibit 1) are subject to valid oil and gas leases and that there are currently one (1) operating carbon dioxide injection well, the Pewinski 1-19A (PN 61643) and two (2) shut-in oil wells, the Mroz & Soule 11-24 (PN 41963) and the State Bagley 1-24 HD1 (PN 29653), in the proposed Unit Area. Mr. Sanders further testified that Petitioner's Plan of Unitization (Exhibit 2) 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 enhanced oil recovery and pressure maintenance operations.

Mr. Sanders was responsible for obtaining ratifications of the Plan of Unitization. He sponsored Exhibit 3, titled Ratification Worksheet. The Exhibit shows that the Petitioner has met all three of the ratification thresholds set forth in MCL 324.61706.

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.

### II. Unit Area

Based on available well control and the 3D seismic data run by the Petitioner (Exhibit 4), Mr. Modroo prepared Exhibit 5, a structure contour map of the reservoir, from which he determined the proposed Chester 19-24 Unit consists of one Guelph (Niagaran) reef, the reef is entirely contained within the proposed Unit Area, and the reef underlies each of the Tracts comprising the Unit Area.

Mr. Sanders testified that the acreage in the SW 1/4 of NW fractional 1/4 of Section 19 (Tract 3) of the proposed Unit Area overlaps acreage contained in the previously unitized Chester 18 Unit Area, formed by Supervisor's Order No. (A) 11-6-78. Under prior testimony pursuant to Order No. 03-2018, Mr. Pardini indicated that after reviewing well

and production data, it is his opinion that there is no communication between the Chester 18 and 19 Fields.

Mr. Pardini sponsored Exhibit 6 showing a geologic cross-section across the reef structure and illustrating the Unitized Formation, which as stated in the petition is described as all the formations lying between the top of the A-1 Carbonate Formation and the base of the Lockport (Gray Niagaran) Formation, or the stratigraphic equivalents encountered in the original vertically drilled discovery well, the Pewinski 1-19 well (PN 28586), located in the NW/4 of the SW 1/4 of Section 19, T30N, R2W, Chester Township, Otsego County, Michigan.

I find the Unitized Formation as proposed by the Petitioner is reasonable and appropriate and should be approved. I find the boundaries of the proposed Unit Area are appropriate. 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

Under prior testimony pursuant to Order No. 03-2018, Mr. Pardini indicated that six (6) wells have been drilled into the Chester 19 Field. Mr. Pardini sponsored Exhibit 10, showing that total primary recovery has been 2,589.7 million barrels of oil (MBO) and 4,340 million cubic feet (MMCF) of gas. Mr. Pardini testified that as of September 30, 2023, 2.139 billion cubic feet (BCF) of carbon dioxide has been injected into the Unitized Formation. The Petitioner believes significantly more oil will be recovered as a result of continued carbon dioxide injection based on the positive results of carbon dioxide injection in the Petitioner's nearby carbon dioxide EOR Units. The Petitioner proposes to continue injecting carbon dioxide into the Unitized Formation utilizing the existing Pewinski 1-19A wellbore. Mr. Pardini testified that carbon dioxide injection in the Chester 19-24 Unit would result in incremental oil recovery of approximately 941± MBO over depletion of the reservoir by primary production operations (Exhibit 10). Further, he testified that adequate volumes of carbon dioxide are readily available to the Petitioner to inject the estimated 11.1 BCF before oil production begins, and sufficient make up carbon dioxide to fill voidage resulting from oil production. Mr. Pardini's enhanced oil recovery production forecast and estimated economics indicate the project will be profitable (Exhibit 12). He estimated the profit after taxes at 14.9 million dollars.

Under prior testimony from Order No. 03-2018, Mr. Pardini indicated no natural gas will be produced for sale from the unitized operations and that natural gas recovered in the production operation will be compressed for reinjection with carbon dioxide. Oil production from the Chester 19-24 Unit will be handled at the Bagley 11-14-23 Unit Central Production Facility, and separate metering will be used to assure proper allocation (Exhibits 7 and 8).

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 carbon dioxide 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.

Mr. Pardini testified there are no reef structures in the acreage adjoining the Unit Area. Mr. Modroo's Exhibit 5 indicates the Chester 19-24 reef closely adjoins the East and South boundaries of the proposed Unit Area. To enable the Petitioner to access such portions of the reservoir as are near the Unit Area boundaries, Mr. Pardini recommended a 150 rather than 330 foot hardline. The Notice of Hearing notifies that exceptions to applicable well spacing provisions are requested.

The Plan of Unitization allocates unit production among the various tracts comprising the proposed Chester 19-24 Unit Area based on the percentage of the total original reservoir volume (hydrocarbon pore volume, or HCPV) under each tract. It was Mr. Pardini'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.

The Supervisor shall prevent the waste prohibited by this Part. [MCL 324.61506]. I find the type of operations contemplated by the Petitioner are feasible and will prevent underground waste [MCL 324.61501(q)(i)] by recovering oil not otherwise recoverable. The Petitioner's operations will prevent surface waste [MCL 324.61501(q)(ii)] which

occurs as a result of operators venting carbon dioxide into the atmosphere, when a means of disposing of carbon dioxide underground is readily available. The Petitioner's operations will protect correlative rights.

I find granting an exception to existing Special Order No. 1-73 and abrogation of Order No. 03-2018 (which established the Chester 19 Unit), are 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 150 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 Special Order No. 1-73 and Order No. 03-2018. Exceptions to these Orders 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 Plan of Unitization has been approved, in writing, by all three of the methods specified in MCL 324.61706, and the Supervisor has found that sufficient ratifications have been obtained.

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 substances 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 AACRS, 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 AACRS, R 324.612(2).

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

8. Due notice of 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 AACRS, R 324.1204.

### **DETERMINATION AND ORDER**

Based upon the Findings of Fact and Conclusions of Law, the Supervisor determines the proposed unitization and enhanced oil recovery project is necessary and prudent to prevent waste and to maximize the ultimate recovery of oil from the proposed Unit Area.

NOW, THEREFORE, IT IS ORDERED:

1. The Petition of Core Energy, LLC is granted, and the proposed Unit Area is hereby created in accordance with, and subject to, the terms, provisions and conditions of this Order and the Plan of Unitization, which is incorporated herein by reference. The Unit Area shall hereafter be known as the Chester 19-24 Unit.

2. Order No. 03-2018 is hereby abrogated for the Chester 19 Unit.

3. Core Energy, LLC is appointed the Unit Operator.

4. The Chester 19-24 Unit is described as: the Southeast 1/4 of the Northeast fractional 1/4, the Northeast 1/4 of Southeast fractional 1/4, and the Northwest 1/4 of the Southeast fractional 1/4 of Section 24, Bagley Township, T30N, R3W; and the Southwest 1/4 of the Northwest fractional 1/4; the Northwest 1/4 of the Southwest fractional 1/4 of Section 19, Chester Township, T30N, R2W, Otsego County, Michigan.

5. The Unitized Formation is described as:

All the formations lying between the top of the A-1 Carbonate Formation and the base of the Lockport (Gray Niagaran) Formation, or the stratigraphic equivalents encountered in the original vertically drilled discovery well in the Chester 19 Pool, the Pewinski 1-19 well (PN 28586) located in the NW/4 of the SW 1/4 of Section 19, T30N, R2W, Chester Township, Otsego County, Michigan.

6. Core Energy, LLC may continue operation of the existing carbon dioxide injection well formerly in the Chester 19 Unit. 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 Chester 19-24 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 Chester 19-24 Unit shall be conducted exclusive of and as an exception to all applicable spacing orders and rules, except no well may be completed in the United Formation at a location closer than 150 feet from the outside boundaries of the Chester 19-24 Unit Area. Core Energy, LLC is authorized to produce wells on the Unit Area at rates that result in the maximum efficient recovery of oil.

9. Unitized operations shall be accomplished by the injection of carbon dioxide. During recycling, whatever native natural gas is left in the Unitized Formation that becomes intermixed with carbon dioxide may be cycled into and out of the Unitized Formation. Water and other substances may be injected into the Unitized Formation only after obtaining the written approval of 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 26, paragraph 26.1, 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 Chester 19-24 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.

December 1, 2023

Dated: \_\_\_\_\_



\_\_\_\_\_  
Adam W. Wygant  
ASSISTANT SUPERVISOR OF WELLS  
Oil, Gas, and Minerals Division  
P.O. Box 30256  
Lansing, Michigan 48909