

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

THE PETITION OF CORE ENERGY, LLC FOR AN)
ORDER FROM THE SUPERVISOR OF WELLS)
APPROVING A PRESSURE MAINTENANCE)
OPERATION FOR RECOVERY OF OIL, GAS, AND) ORDER NO. 23-2008
RELATED HYDROCARBONS, AND ABROGATING)
EXISTING SPACING AND PRORATION ORDERS)
AND RULES IN THE CHESTER 2-30N-2W FIELD.)

OPINION AND ORDER

This case involves the Petition of Core Energy, LLC (Petitioner) for approval of secondary recovery operations in the Chester 2-30N-2W Field, referred to by the Petitioner as the Chester 2 Pool. Petitioner is requesting (i) an order approving a secondary or enhanced recovery operation pursuant to Section 61506(i), Part 615, Supervisor of Wells, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) and R 324.612; and (ii) approval to operate the Field as an exception to Order No. 8-1-73; Order No. 28-9-74; Special Order No. 1-73; and Part 615 of the NREPA, and its administrative rules. The Chester 2 Pool, as proposed, is wholly included within the W 1/2 of the SW 1/4 of Section 2; the E 1/2 of the SE 1/4 of Section 3; E 1/2 of the NE 1/4 of Section 10; and the W 1/2 of the NW 1/4 of Section 11, T30N, R2W, Chester Township, Otsego County, Michigan.

JURISDICTION

The development of oil and gas in this State is regulated under Part 615, Supervisor of Wells, of the 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, 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 of 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 December 2, 2008.

FINDINGS OF FACT

Petitioner specifically requests that the Supervisor issue an Order allowing Petitioner to inject carbon dioxide (CO₂) into the Guelph Dolomite/Ruff Formation, the productive zone, for purposes of secondary recovery, and exempt the Chester 2 Pool (Unit Area) from the applicable spacing and proration rules and orders. Petitioner requests approval of the Supervisor to drill and utilize additional wells in the Unit Area provided no well is closer than 50 feet from the unit boundary.

In support of its case, the Petitioner offered the testimony of Mr. Robert G. Mannes, President of Core Energy, LLC; Mr. Allen Modroo, geophysicist for Petitioner; and Mr. Rick Pardini, Petroleum Engineer and Vice President of Engineering and Operations for Petitioner. Mr. Modroo was recognized as an expert in the field of geophysics, and Mr. Pardini was recognized as an expert in the field of geological engineering.

The Administrative Law Judge determined the Notice of Hearing was properly served and published. No answers to the Petition or appearances were filed; therefore, the Petitioner is the only party to this case. The Supervisor designated the hearing to be an evidentiary hearing pursuant to R 324.1205(1)(b) and directed substantive evidence be presented in the form of oral testimony.

Unit Area

Mr. Pardini testified that the P. J. Cargas #1 (PN 28459); the P. J. Cargas #1-2A (PN 31646); the Wolf 1-A (PN 29430); the Wolf 1-B (PN 29677); and the Wolf "C" 1 HD1 (PN 29958) wells were drilled to test the productive zone in the Chester 2 Pool. Currently, there are only two productive wells producing in the Unit Area: the Wolf 1-A and the Wolf "C" 1 HD1. All wells were drilled in accordance with Orders 8-1-73 and/or

28-9-74 issued by the Supervisor and a letter dated August 13, 2001, establishing a 320 acre drilling unit pursuant to spacing exceptions under Rule 303(2) for the Chester 2 Pool. The drilling unit is identical in legal description to the Unit Area as proposed by Petitioner (Exhibit 2).

The drilling unit was established pursuant to a Voluntary Pooling Agreement dated November 30, 2000, which was recorded in Otsego County records (Exhibit 3). Mr. Mannes testified that all mineral interests in the Unit Area are subject to valid oil and gas leases; and all oil and gas leases in the unitized zone are owned by Petitioner, as Operator. All owners in the Unit Area ratified the 320 acres as a drilling unit (Exhibit 3). The Voluntary Pooling Agreement authorized the Unit Area to be repressured or water flooded for secondary recovery operations (Exhibit 3). Mr. Mannes described Petitioner's prior five CO₂ enhanced oil recovery units (Exhibits 13-17). In his opinion, such projects indicate enhanced oil recovery by CO₂ injection is technically and economically feasible.

Mr. Modroo testified, based on his review of seismic and well control data, that the reef is wholly contained within the Unit Area and there is no structural connection between the reef penetrated by the producing wells on the Unit Area and any other reef structure on adjoining or nearby lands (Exhibit 5). Mr. Modroo testified that, based on his examination of the Cargas/Wolf wells and nearby Guelph Dolomite/ Ruff Formation penetrations, in his opinion, there is no fluid or pressure communication between the reef penetrated by the Cargas/Wolf wells and any other reef structure on adjoining or nearby lands. Mr. Pardini testified that the pressure data indicates no connection between the Chester 2 pool and the Chester 10A pool to the South (Exhibit 9).

Based on the evidence establishing the Chester 2 pool to be separate and distinct from any other Guelph Dolomite/Ruff formation pool, Petitioner requested that it be allowed to drill a new development well on the Unit Area with the wellbore located anywhere not less than 50 feet from the outside boundary of the Unit Area.

I find the boundaries of the proposed Chester 2 Unit Area are appropriate and all productive portions of the reservoir are within the unitized zone in the proposed Chester 2 Unit Area. I find Petitioner did not notice offset owners of its request to drill a well not

less than 50 feet from the unit boundary. Petitioner may petition for a hearing at such time it deems it necessary to drill a well less than 330 feet from the unit boundary.

Secondary Recovery

Using the log of the Cargas #1-2A well (Exhibit 4), Mr. Modroo testified that the unitized zone will be the Guelph Dolomite/Ruff Formation encountered in the interval from 5,334 feet to 5,938 feet measured depth in the Cargas #1-2A well (PN 31646) located in the SW 1/4 of the SW 1/4 of Section 2, T20N, R2W, Chester Township, Otsego County, Michigan. Mr. Modroo indicated this zone is effectively from the bottom of the B Salt to the top of the Gray Niagaran in the Cargas #1-2A well.

Mr. Pardini testified a total of 1,038,383 barrels of oil had been produced from the field on primary production (Exhibits 6 and 12). To recover additional oil, Petitioner proposes that CO₂ and other substances approved in advance by the Supervisor will be injected in the Cargas/Wolf wells at relatively high injection rates for purposes of reintroducing energy to the reef and mobilizing the oil. The maximum surface injection pressure will be determined by Petitioner's United States Environmental Protection Agency (USEPA) permit. It is anticipated that pressure will be a maximum of 2,142 pounds per square inch (psi).

Mr. Pardini testified the Wolf 1-A well will be converted from a producer to a CO₂ injection well. Petitioner proposes to initially inject up to 1.8 billion cubic feet of CO₂ into the well. This roughly equates to 104,651 tons of CO₂. Mr. Pardini projects that the initial CO₂ injection sequence will take approximately 12 to 18 months after which the initial production sequence will occur. Petitioner expects to initiate several injection-production cycles. After a period of injection, the Wolf "C" 1 HD1 will be placed on production. Petitioner expects that the reef will accept CO₂ at the projected injection pressure, and Mr. Pardini testified the injection pressure will not exceed the lower of maximum injection pressures established by the USEPA and the Supervisor. Petitioner requests that during the production sequence, the Wolf "C" 1 HD1 well (or any of the other wells located in the Unit Area) be allowed to produce at its maximum efficient rate.

It is Petitioner's opinion that secondary recovery is necessary for recovery of additional reserves from the Chester 2 Pool. Petitioner indicated that the characteristics

of the Chester 2 Pool made it favorable for CO₂ injection. Mr. Pardini projects the recovery of an additional 316,973 barrels of oil from the Chester 2 Pool by the type of operations Petitioner proposes (Exhibits 6 and 12). Petitioner requested that it be authorized to inject fluids other than CO₂ into the reservoir, provided it first obtains all required permits and approvals.

I find the testimony indicates the proposed Chester 2 Unit Area contains significant accumulations of hydrocarbons which will not be recovered by primary production but may be recovered by secondary recovery operations. I find the secondary recovery project requested is reasonably necessary to substantially increase recovery of oil from the proposed Chester 2 Unit Area.

I find the type of operations contemplated by Petitioner are feasible, will prevent underground waste by recovering oil not otherwise recoverable, will decrease the amount of CO₂ vented into the atmosphere, and will protect correlative rights. I find abrogation of the existing spacing, well location, and proration requirements of Order No. 8-1-73, Order No. 28-9-74, Special Order No. 1-73, and Part 615 of the NREPA, and its administrative rules, is necessary to implement the secondary recovery project, except no well shall be completed in the unitized zone at a location closer than 330 feet from the outside boundary of the Chester 2 Unit Area.

CONCLUSIONS OF LAW

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

1. The applicable spacing for the Chester 2 Unit Area is 320 acres as established by the Supervisor pursuant to Order Nos. 8-1-73; 28-9-74; and the Supervisor's letter under Rule 324.303(2), dated August 13, 2001.

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

3. 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).

4. 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, R324.612(2).

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

6. 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 the proposed secondary recovery operations will prevent waste.

NOW, THEREFORE, IT IS ORDERED:

1. The Chester 2 Unit Area is described as the W 1/2 of the SW 1/4 of Section 2; the E 1/2 of the SE 1/4 of Section 3; the E 1/2 of the NE 1/4 of Section 10; and the W 1/2 of the NW 1/4 of Section 11, T30N, R2W, Chester Township, Otsego County, Michigan.

Such lands shall be considered and operated as one development unit consisting of 320 acres. The unit shall be referred to as the Chester 2 Unit. The unitized zone is described as:

That portion of the Guelph Dolomite/Ruff Formation encountered in the interval from 5,334 feet to 5,938 feet measured depth in the Cargas #1-2A well (PN 31646) located in the SW 1/4 of SW 1/4 of Section 2, T30N, R2W, Chester Township, Otsego County, Michigan.

2 Core Energy, LLC is authorized to inject CO₂ into the unitized zone and may inject other substances upon receipt of written approval from the Supervisor. Core Energy, LLC shall not allow the bottom hole pressure in any injection well to exceed formation fracturing pressure allowed under Part 615 of the NREPA, and its administrative rules.

3. Core Energy LLC shall notify the Supervisor prior to the commencement of injection operations and at least 30 days prior to the anticipated date of abandonment of injection operations. Unless authorized by the Supervisor, secondary recovery shall be limited to the injection of CO₂ or other approved substances. 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.

4. Operation of the Chester 2 Unit shall be conducted exclusive of and as an exception to Order No. 8-1-73, Order No. 28-9-74, Special Order No. 1-73, any other applicable spacing or proration order, and Part 615 of the NREPA, and its administrative rules, provided no well shall be drilled closer than 330 feet from the unit boundary. Core Energy LLC is authorized to produce wells in the Unit Area at rates that result in the maximum efficient recovery of hydrocarbons. All other applicable provisions of the administrative rules of Part 615 of the NREPA shall be adhered to.

5. The Supervisor shall retain jurisdiction in this matter.

6 This Order shall be effective immediately.

Dated: Jan. 26, 2009



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 CORE ENERGY, LLC FOR AN)
ORDER FROM THE SUPERVISOR OF WELLS)
APPROVING A PRESSURE MAINTENANCE)
OPERATION FOR RECOVERY OF OIL, GAS, AND) CAUSE NO. 23-2008
RELATED HYDROCARBONS, AND ABROGATING)
EXISTING SPACING AND PRORATION ORDERS)
AND RULES IN THE CHESTER 02-30N-02W FIELD.)
)

at a session of the Department of Environmental Quality held
at Lansing, Michigan, Harold R. Fitch, Assistant Supervisor
of Wells, Presiding

ORDER OF ADJOURNMENT

The Supervisor of Wells hearing in this matter scheduled for 1:30 p.m. on November 5, 2008, is adjourned at the request of Petitioner, Core Energy LLC. There are no other parties to this matter.

NOW THEREFORE, IT IS ORDERED:

The contested case hearing on Cause No. 23-2008, is hereby adjourned and rescheduled for December 2, 2008, at 9:30 a.m. in the Stephen Nisbet Hearing Room, Atrium Level, South Tower, Constitution Hall, 525 West Allegan Street, Lansing, Michigan.

Dated: Nov. 5, 2008


HAROLD R. FITCH
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STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
SUPERVISOR OF WELLS

IN THE MATTER OF

THE PETITION OF CORE ENERGY, LLC FOR AN)
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EXISTING SPACING AND PRORATION ORDERS)
AND RULES IN THE CHESTER 02-30N-02W)
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 FIFTH DAY OF NOVEMBER (NOVEMBER 5) 2008, BEGINNING AT 1:30 P.M., OR AS SOON THEREAFTER AS MAY BE HEARD, 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, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), MCL 324.61501 et seq.; the administrative rules, 1996 AACS, 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.

This hearing is for the purpose of receiving testimony and evidence pertaining to the need or desirability of issuing an order in the matter of the petition of Core Energy, LLC (Petitioner), 954 Business Park Drive, Suite 1, Traverse City, Michigan 49686.

Petitioner requests an order approving an enhanced recovery or pressure maintenance operation pursuant to Section 61506(i), Part 615 of the NREPA and R 324.612. Petitioner proposes to conduct enhanced recovery operations by injecting carbon dioxide and such other substances as the Supervisor of Wells may approve into the reservoir known as the Chester 02-30N-02W Field, and described as that portion of the Guelph Dolomite/Ruff Formation encountered in the interval from 5,334 feet measured depth to 5,938 feet measured depth, in the Cargas 1-2A well, Permit No. 31646, located in the SW 1/4 of SW 1/4 of Section 2, T30N, R2W, Chester Township, Otsego County, Michigan. Petitioner also proposes to operate the Chester 02-30N-02W Field as an exception to the applicable spacing and proration provisions of Special Order No. 1-73, Part 615 of the NREPA, and its administrative rules. The Chester 02-30N-02W Field is wholly included within the Unit Area described as the W 1/2 of SW

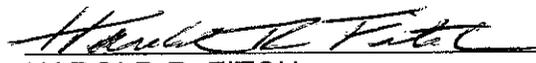
1/4, Section 2; E 1/2 of SE 1/4, Section 3; E 1/2 of NE 1/4, Section 10; and W 1/2 of NW 1/4, Section 11, T30N, R2W, Chester Township, Otsego County, Michigan.

You can obtain a copy of the written petition by requesting one in writing from Mr. Robert G. Mannes, 954 Business Park Drive, Suite 1, Traverse City, Michigan 49686, telephone number 231-946-2419.

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). Proof of mailing or delivering the answer shall be filed with the Supervisor on or before the date of the hearing. The answer shall state with specificity the interested person's position with regard to the petition. Failure to prepare and serve an answer in a timely manner shall preclude you from presenting evidence or cross-examining witnesses at the hearing. If an answer to the petition is not filed, the Supervisor may elect to consider the petition and enter an order without oral hearing. Mail the answer to the petition to Mr. Robert G. Mannes at the above address, and to the Supervisor in care of the Assistant Supervisor of Wells, Mr. Harold R. Fitch, Office of Geological Survey (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: *Sept. 30, 2008*


HAROLD R. FITCH
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