

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

IN THE MATTER OF:

THE PETITION OF BREITBURN OPERATING, L.P., FOR AN )  
ORDER FROM THE SUPERVISOR OF WELLS AMENDING )  
ORDER NO. 5-6-91 AND AUTHORIZING A THIRD WELL ON A )  
960-ACRE PRAIRIE DU CHIEN FORMATION DRILLING UNIT ) ORDER NO. 04-2011  
IN PARTS OF SHERMAN AND ROSE LAKE TOWNSHIPS, )  
OSCEOLA COUNTY. )

**OPINION AND ORDER**

This case involves the Petition of BreitBurn Operating, L.P. (Petitioner). The Petitioner seeks an Order from the Supervisor of Wells (Supervisor) authorizing a third well on a 960-acre Prairie du Chien Group (PdC) drilling unit as an exception to Order No. 5-6-91. The drilling unit, referred to by the Petitioner as the Emery Lake PdC Field, consists of all of Section 33, T20N, R9W, Sherman Township, and the N 1/2 of Section 4, T19N, R9W, Rose Lake Township, Osceola County.

**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, 1994 PA 451, as amended. 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. To that end, the Supervisor may establish drilling units and well spacing. MCL 324.61513(2) and (5). While generally, well spacing has been established at one well per unit, the Supervisor may issue special spacing orders establishing different well spacing patterns after an evidentiary hearing. 1996 MR 9, R 324.301 and R 324.302. 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 and R 324.1203. The evidentiary hearing in this matter was held on March 31, 2011.

**FINDINGS OF FACT**

The Petitioner specifically requests that the Supervisor issue an Order granting an exception to Order No. 5-6-91 for the proposed State Sherman 3-33 well to be drilled to and completed in formations below the top of the Glenwood Member of the Black River Group.

The Administrative Law Judge determined the Notice of Hearing was properly served and published. No answers to the Petition were filed, and only the Petitioner appeared at the hearing. 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)(b) and directed substantive evidence be presented in the form of oral testimony.

In support of its case, the Petitioner offered the testimony of its employees, Mr. David McCullough, Geologist, and Mr. Kenneth Charles Adams, Eastern Division Exploitation Manager. Mr. McCullough was recognized as an expert in the area of petroleum geology. Mr. Adams was recognized as an expert in the field of reservoir engineering.

The spacing of wells targeting the PdC Group is generally governed by Special Order 1-86. This order establishes drilling units of 640 acres, more or less, consisting of four contiguous governmental-surveyed quarter sections of land in a square, with allowances being made for the size and shape of irregular and corrected government-surveyed quarter sections. Under Special Order 1-86, it is presumed that one well will efficiently and economically drain hydrocarbons beneath the entire 640-acre unit. The State Sherman & Forshee Cooper 1-33 well (Permit No. 41327) was drilled in 1990 under Special Order 1-86. Order No. 5-6-91, issued October 17, 1991, granted Nomeco Oil & Gas Co. an exception to establish a 960-acre drilling unit for this well. Order No. 5-6-91 also authorized the later drilling of a second well on the 960-acre unit without an evidentiary hearing. After obtaining written permission from the Supervisor, Nomeco Oil & Gas Co. drilled the State Sherman & Allen 2-33 well (Permit No. 51503) in 1996 as the second well on the unit. The Petitioner holds both permits and has operated both wells since 2007.

Mr. McCullough testified the State Sherman & Forshee Cooper 1-33 well was completed in the Middle PdC. It was a strong oil and gas producing well but has recently declined to about 12 barrels of oil per day and 936 thousand cubic feet of gas per day due in part to depletion and to partially collapsed casing. The State Sherman & Allen 2-33 well was also completed in the Middle PdC as an oil and gas producer. It experienced a series of casing failures starting in 2008. It has been plugged back to a measured depth of 6,125 feet and has been nonproductive since 2010 and will be replaced by the proposed State Sherman & Allen 2-33A well. Mr. Adams testified the 1-33 well is experiencing similar mechanical problems that have not yet resulted in loss of the wellbore.

Mr. McCullough testified that after reviewing seismic and well control data, it is his opinion the 960-acre unit established by Order No. 5-6-91 remains an appropriate unit for all

formations below the top of the Glenwood Member of the Black River Group because most of the interpreted structure and all of the interpreted reservoir lies within the 960-acre unit (Exhibit 3).

Mr. McCullough testified a structural cross section for the Emery Lake PdC Field shows the tops of the various zones within the PdC, the zones that have been historically productive, and also zones interpreted to be potentially productive. He believes that based on the continuity of the sandstone zones through the well logs of the 1-33 and 2-33 wells, it is reasonable to conclude productive zones will be present in the proposed 2-33A and 3-33 wells.

Mr. McCullough stated these two new penetrations will encounter the PdC at a higher structural position than the two existing wells, allowing the Petitioner to develop new areas of the reservoir.

Mr. Adams reviewed the productive history of the Emery Lake PdC Field (Exhibits 13-17) and testified that cumulative production for the Field as a whole has been 1.01 million barrels of oil, 7.8 billion cubic feet of gas, and 282.4 thousand barrels of natural gas liquids.

Mr. Adams testified as to the decreased production from the Middle PdC, the damaged wellbores of the two existing wells, and mud log shows and log analysis indicating the presence of untested and/or tested but unproduced zones. Due to these factors, the Petitioner has developed a plan to develop known unproduced reserves in the Field and test potential new pay zones. The Petitioner's plan is to: (i) replace the 2-33 well with the 2-33A sidetrack to a bottom hole location in the North one half of the unit; (ii) continue to produce the 1-33 only in the Middle PdC zones in which it is presently completed, until the casing fails completely or depletion occurs; and (iii) drill the new 3-33 well as the third well on the unit in the southerly portion of the unit. If the 1-33 well fails, the Petitioner plans to replace the well.

Mr. Adams testified both the 2-33A and 3-33 wells will be drilled through the Lower PdC. The Petitioner believes some recoverable oil and gas reserves may be encountered in the Middle PdC at the locations of the two proposed wells, as the new bottom hole locations will be some distance from the depleted 1-33 bottom hole location and the abandoned 2-33 bottom hole location. If commercially producible undrained reserves are encountered, the Petitioner will consider completing in the Middle PdC. However, the more likely scenario will be completion in the Glenwood and Upper PdC A Zones.

Mr. Adams testified regarding the Petitioner's studies of analogous Glenwood production in other PdC fields. On the basis of the Petitioner's studies of 18 Glenwood fields (Exhibit 23) and plotting production decline profiles (Exhibit 20), Mr. Adams testified that drainage areas from analogous Glenwood formation wells ranged from 5 acres to 371 acres (Exhibit 21). The

average drainage area is 175 acres (Exhibit 20). Similar drainage areas are expected in the Upper PdC A and E Zones (Exhibit 19). Mr. Adams concluded that if the new proposed wells are both completed in the Glenwood/Upper PdC A or E Zones, then to accomplish adequate and efficient drainage, the 2-33A well is needed in the N 1/2 of Section 33, and the 3-33 well is needed at a bottom hole location in the N 1/2 of Section 4.

Mr. Adams prepared an economic analysis of the proposed 3-33 well (Exhibit 26). Based on the projected reserves in the Glenwood and Upper PdC A Zone, and based on a gross capital cost of \$3.75 million, he concluded the 3-33 well will be an economic well.

Based on the evidence, I find that the proposed 3-33 well is necessary to adequately, efficiently, and economically drain the remaining oil and/or gas from the unit. Order No. 5-6-91 should be amended to provide for a third well on the unit.

#### **CONCLUSIONS OF LAW**

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

1. In the Emery Lake PdC Field, well location requirements and production allowables for wells drilled in formations below the Glenwood Member of the Black River Group, in Osceola County, Michigan, are controlled by Order No. 5-6-91.
2. Exceptions to the spacing and location requirements for wells may be granted after notice and hearing.
3. The Supervisor may issue a special spacing order establishing different well spacing patterns after an evidentiary hearing. 1996 MR 9, R 304.301, and R 324.302.
4. The Supervisor has jurisdiction over the subject matter and the persons interested therein.
5. 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 permitting a third well to be drilled at the location requested for the proposed State Sherman 3-33 well, on the 960-acre drilling unit established by Order No. 5-6-91, will prevent waste and protect correlative rights.

**NOW, THEREFORE, IT IS ORDERED:**

1. An exception to Order No. 5-6-91 is granted to authorize the drilling, completing, and producing of a third well on the 960-acre unit. Petitioner is authorized to drill the State Sherman 3-33 well at the proposed location.
2. If the State Sherman & Forshee Cooper 1-33 well must be plugged and abandoned, then it may be replaced at such location on the unit as is approved by the Supervisor after filing of a drilling permit application for the well.
3. The presently established 960-acre unit shall be maintained for all wells drilled, completed, and producing from any zones below the top of the Glenwood Member of the Black River Group.
4. The proration allowables presently applicable to production from any well completed and producing in the Middle PdC A and B Zones shall remain at 350 barrels of oil and/or 1.5 MMCF of gas per day. For production from other zones, the Supervisor retains jurisdiction to set appropriate production allowables or, in the case of gas wells, to transfer jurisdiction to the Michigan Public Service Commission for the setting of gas well allowables.
5. The Supervisor retains jurisdiction in this matter.
6. This Order shall be effective immediately.

DATED: *May 12, 2011*

  
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