

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
OIL, GAS, AND MINERALS DIVISION

IN THE MATTER OF:
THE PETITION OF RIVERSIDE ENERGY MICHIGAN, LLC, FOR
AN ORDER OF THE SUPERVISOR OF WELLS APPROVING AN
ENHANCED GAS RECOVERY OPERATION, BY INJECTION OF
CARBON DIOXIDE, AND SUCH OTHER APPROPRIATE
SUBSTANCES AS MAY BE APPROVED, INTO THE ANTRIM
FORMATION, FOR THE CHESTONIA/KEARNEY CO₂ USP, IN
PARTS OF SECTIONS 5, 6, 7, 8, 17 AND 18 IN TOWNSHIP 30
NORTH, RANGE 6 WEST, (CHESTONIA TOWNSHIP) AND
SECTIONS 1, 11 AND 12 IN TOWNSHIP 30 NORTH, RANGE 7
WEST, (KEARNEY TOWNSHIP) ALL IN ANTRIM COUNTY,
MICHIGAN.

CAUSE NO. 02-2020

PETITION

RIVERSIDE ENERGY MICHIGAN, LLC ("Petitioner"), by and through its attorneys, Worman & Dixon, PLC, and in support of its Petition, filed in accordance with Act No 451, Public Acts of 1994, Part 615, and the rules promulgated thereunder, states:

1. Petitioner is a Michigan limited liability company involved in the exploration for and production of oil and gas in the State of Michigan. The office of Petitioner is located at 10691 East Carter Road, Suite # 201, Traverse City, Michigan 49684.
2. Petitioner is the record owner of valid and subsisting oil and gas leases covering oil and gas interests in the Unitized Formation beneath the land described below. These lands are underlain by a pool or common source of supply in the lands described as follows:

Township 30 North, Range 6 West, Chestonia Township

Section 5: SW/4 SW/4

Section 6: S/2

Section 7: Entire

Section 8: W/2, W/2 E/2

Section 17: N/2

Section 18: N/2

Township 30 North, Range 7 West, Kearney Township

Section 1: SE/4, W/2

Section 11: Entire, except W/2 SW/4

Section 12: Entire

Petitioner has previously submitted its application that the above described lands be established as a Uniform Spacing Plan (USP) pursuant to Order No. 14-9-94. For purposes of this Petition, the above described lands will be at times referred to as the Chestonia/Kearney CO₂ USP.

3. The subject matter of this Petition is a request, pursuant to Rule 324.612, to institute a carbon dioxide (CO₂) injection operation for the purpose of secondary recovery and/or enhanced recovery in the unitized formation of the Chestonia/Kearney CO₂ USP in order to maximize the recovery of gas. The injection will occur through the use of one or more of the modified existing wellbores. Petitioner also requests authority from the Supervisor to inject such other appropriate substances as the Supervisor should approve in advance.
4. The Chestonia/Kearney CO₂ USP is wholly included within the described lands in paragraph 2. The Chestonia/Kearney CO₂ USP is underlain by the pool or common source of supply within the following formations:
 - a. All formations lying between the top of the Lachine and the Base of the Norwood (often referred as the Antrim), or the stratigraphic equivalents encountered in the original vertical well in the Chestonia/Kearney CO₂ USP pool, the Green River D4-7 well (P.N. 42879) located in the SE/4, SE/4, SE/4 Section 7, T30N, R6W, Chestonia Township, Antrim County, Michigan, hereinafter referred to as the "Unitized Formation".
5. Twenty-eight (28) wells have been drilled into the Unitized Formation within the proposed Chestonia/Kearney CO₂ USP. These wells are described:

| Project Name | | (Operator) | | (County) | |
|---------------------------------------|--------|----------------------------------|-------|----------|--|
| Chestonia/Kearney CO ₂ USP | | (Riverside Energy Michigan, LLC) | | (Antrim) | |
| Well Name | Well # | DEQ# | MPSC# | TD Date | |
| Burnett | A1-7 | 48958 | 7127 | 09/27/95 | |
| Burnett | A1-8 | 48783 | 6829 | 11/26/94 | |
| Burnett | A3-18 | 55813 | 10675 | 09/11/03 | |
| Burnett | A3-7 | 48979 | 7128 | 09/23/95 | |
| Burnett | C1-6 | 49833 | 7129 | 10/02/95 | |
| Burnett | C3-6 | 48978 | 7130 | 09/21/95 | |
| Burnett | D1-12 | 48970 | 7132 | 09/30/95 | |
| Burnett | D1-5 | 48731 | 7126 | 09/22/95 | |
| Burnett | D1-7 | 49834 | 7131 | 09/28/95 | |
| Burnett | D3-12 | 48980 | 7136 | 09/29/95 | |
| Cuca | C3-8 | 49854 | 7605 | 03/30/96 | |
| Devriese | B3-8 | 50379 | 7644 | 03/04/96 | |

| | | | | |
|-------------------|----------|-------|-------|----------|
| Green River | D4-7 | 42879 | 7070 | 12/22/89 |
| Kafi | B1-12 | 49837 | 7137 | 09/29/95 |
| Kafi | B3-12 | 55812 | 10671 | 10/01/03 |
| Kafi | B4-12 | 48981 | 7134 | 09/26/95 |
| Kafi | C2-1 | 50665 | 7586 | 03/14/96 |
| Kafi | C3-1 | 49835 | 7183 | 10/03/95 |
| Kafi | D1-1 | 49836 | 7584 | 03/13/96 |
| Kotz | C2-11 | 48972 | 7133 | 09/28/95 |
| Kunz | B1-18 | 48878 | 6830 | 11/10/94 |
| Kunz | B4-18 | 48782 | 7089 | 09/18/95 |
| Moore | C3-11 | 48732 | 7101 | 08/03/94 |
| St. Kearney et al | A1-11 HD | 58566 | 12252 | 10/29/07 |
| St. Kearney et al | A3-11 HD | 58588 | 12267 | 11/07/07 |
| Thompson | D3-8 | 49850 | 7601 | 02/27/96 |
| Urban | B4-17 | 49852 | 7603 | 03/29/96 |
| Wright | A4-17 | 49853 | 7604 | 03/28/96 |

Attachment A is a map showing (i) USP described in Paragraph 2 hereof, (ii) the locations of all wells drilled in the Chestonia/Kearney CO₂ USP and within 1320 feet of the USP, (iii) the unit outline for the Chestonia/Kearney CO₂ USP. There is no third party lease ownership within 1320 feet of the proposed Chestonia/Kearney CO₂ USP. Ownership of the surface and minerals within the 1320 feet buffer is set out on Page 2 of Exhibit A.

6. The Chestonia/Kearney CO₂ USP is subject to an existing Unitization Agreement executed by the Petitioner's predecessor. A copy of the Unitization Agreement and the most recent amendment to the Unitization Agreement is Attachment B hereto. The Petitioner is the Unit Operator. The Unitization Agreement, as amended, authorizes the Petitioner, or its successor or assigns, to operate the proposed Unitized Formation on a unitized basis, to drill vertical and/or horizontal wells, conduct enhanced recovery, secondary recovery and/or pressure maintenance operations by injecting appropriate outside substances in such quantities and pressures of the proposed Plan of Unitization, such operations to be conducted singly or in combination, in efforts to maximize the recovery of gas. All royalty interest is subject to the Unitization Agreement, as amended, and the proceeds of production from the Chestonia/Kearney CO₂ USP will be allocated among the owners of the oil and gas leasehold interests, in the Unit Area, as defined in the most recent amendment of the Unitization Agreement, in accordance with the Unitization Agreement and the operative oil and gas leases.
7. Petitioner has reviewed, studied and analyzed Unitized Formation to determine a method of development and operation which will enhance the recovery of the remaining natural gas from the Chestonia/Kearney CO₂ USP. Petitioner plans to utilize several existing wells which will be converted to injection wells.

8. Petitioner proposes to implement a carbon dioxide (CO₂) injection operation for the purpose of Enhanced Gas Recovery (EGR) in the proposed Unitized Formation beneath the Chestonia/Kearney CO₂ USP in order to enhance the recovery of natural gas. Petitioner's analysis of the Antrim Shale indicates that the Antrim Shale stores methane gas through adsorption. As formation pressure is lowered, the rock releases both methane and CO₂. The methane desorbs from the rock at a higher rate than the CO₂ as the shale matrix preferentially desorbs methane. By injecting CO₂, the partial pressure of CO₂ is increased, which creates a driving force for the adsorption of CO₂ and desorption of additional methane to the fracture system and ultimately to the wellbore. This process of the adsorption of CO₂ and the desorption of methane is depicted on Exhibit C.
9. The injection and production will initially occur through the use of existing well bores. Subject to permitting requirements, Petitioner requests authority from the Supervisor to allow the use of up to six (6) production wells to be converted to injection wells within the proposed Unit Area, as are necessary for sufficient development, and to inject carbon dioxide and/or such other appropriate substances as the Supervisor should approve in advance. Exhibit D is a schematic of the facilities Petitioner proposes for the project.

Petitioner will comply with all of the regulations of the Federal Environmental Protection Agency (EPA) in connection with its injection practices. A firm source of supply of adequate volumes of CO₂ is readily available. Petitioner will file an Underground Injection Control (UIC) permit application with the EPA for injection of CO₂ into Unitized Formation. To enhance gas recovery, it may be necessary to inject other substances in the future. Petitioner requests that the authority to approve the injection of other substances be reviewed at staff level with final approval by the Supervisor without a hearing.
10. Petitioner proposes to operate the Chestonia/Kearney CO₂ USP, and all the existing wells identified above, and any necessary additional wells, in concert, for the purpose of enhancing production of gas. In this regard, Petitioner may utilize one or more of the existing wells or new wells as an injector at any time and from time to time, subject to permitting requirements.
11. Enhanced recovery operations of the nature proposed by Petitioner are feasible, will prevent waste and will protect correlative rights. Article 2.6 of the Unitization Agreement authorizes such operations and other types of secondary, supplemental, enhanced and/or pressure maintenance operations.
12. Approval of the proposed CO₂ injections is reasonably necessary to substantially increase the ultimate recovery of gas from the proposed Unit Area. Petitioner estimates that the proposed

unit operations will result in the recovery of significant additional millions of cubic feet of gas, as compared to continued operation of the Chestonia/Kearney CO₂ USP on primary production under the provisions of the applicable existing Orders described above.

13. The estimated additional cost of conducting unitized operations during the life of the unit will not exceed the value of the additional hydrocarbons recovered by the unitized operations.
14. All of the owners of interests in the oil, gas and minerals in the proposed Unitized Formation in the proposed USP are subject to oil and gas leases. Petitioner has submitted Form EQP 7200-23 for the establishment by the Supervisor of a USP that describes the same lands referred to in Paragraph 2 of this Petition as the Chestonia/Kearney CO₂ USP.
15. Pertinent geological and reservoir engineering data in support of the Petition are attached as follows:

| <u>Exhibits</u> | <u>Description</u> |
|-----------------|---|
| E | Geological Cross Section |
| F | Field Structure Map of Antrim |
| G | Primary Production History |
| H | Reservoir and Properties |
| I | Estimated Volumes in Place and Recoveries |
| J | Estimated Economics of the Project |

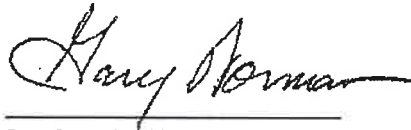
16. The names and addresses of all persons owning a record interest in the surface, the oil, gas and minerals, and oil and gas leasehold interests, in the proposed Unitized Formation in the Chestonia/Kearney CO₂ USP are set forth in Attachment K. Also included in Attachment K are the names of the tax assessed owners, as per the Antrim County Treasurer's Office, within the proposed Unit Area.
17. "The Review, "P.O. Box 313, Bellaire, Michigan 49615, is a newspaper of general circulation in Antrim County, Michigan. The "Michigan Oil & Gas News, "P.O. Box 250, Mt. Pleasant, Michigan 48804-0250, is an oil and gas industry publication of general circulation in the State of Michigan. Each of the publications identified above qualifies for publication of legal notices.
18. Approval of the proposed Enhanced Recovery Operations, as set forth in this Petition, is reasonably necessary to substantially increase the ultimate recovery of natural gas from the Chestonia/Kearney CO₂ USP, and the type of operations proposed are feasible, will prevent waste, and will protect correlative rights.
19. The Petitioner's contact person to whom inquiries may be made is Mr. Phillip Koro at telephone number 231-995-4096. His address is set forth in Paragraph 1.

WHEREFORE, Petitioner requests that the Supervisor of Wells enter an order approving the injection of CO₂, nitrogen, water and such other appropriate substances as the Supervisor of Wells

shall approve in advance as proposed herein, providing the Chestonia/Kearney CO₂ USP shall be operated exclusive of and as an exception to Act No. 451, Public Acts of 1994, Part 615, and Order No. 14-9-94 and further providing that any such rules or orders shall be abrogated to the extent inconsistent with the proposed secondary recovery operation of the Chestonia/Kearney CO₂ USP and granting such further and additional relief as may be just and equitable.

Respectfully Submitted,

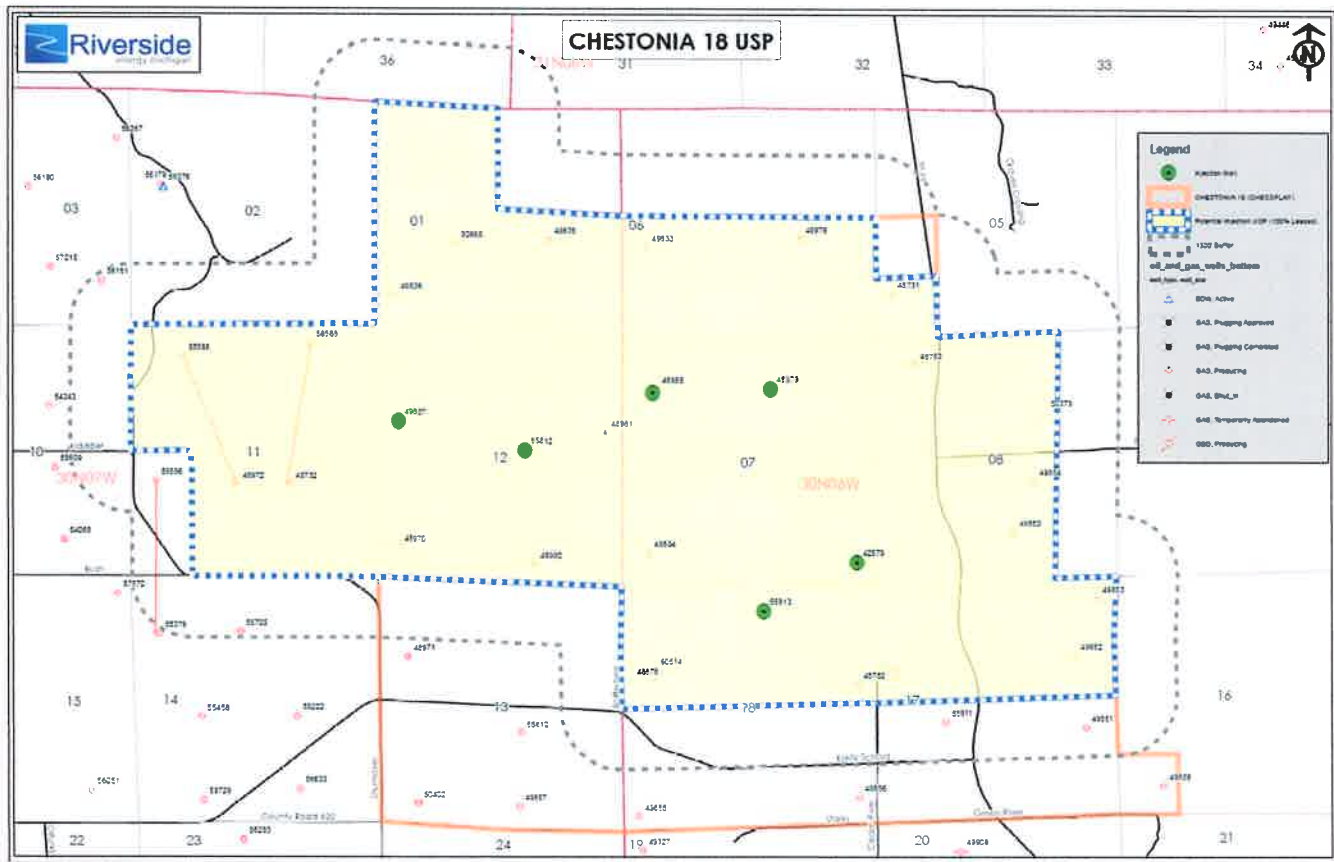
Worman & Dixon, PLC,
Attorneys for Riverside Energy Michigan, LLC

A handwritten signature in black ink, appearing to read "Gary Worman", written over a horizontal line.

By: Gary L. Worman
100 East Ash Street
P.O. Box 219
Mason, MI 48854-0219

Dated: February 27, 2020

Exhibit A - Chestonia 18 Pool Unit Area and Wells Map



Ownership within 1320 Feet of Outside Boundary of Unit Area

| Name #1 | Name #2 | Address | City/State/Zip | Tax ID # | Town/Range/Section | Brief Legal |
|--|---------------------------|---------------------------------|--------------------------|------------------|--------------------|-------------------------------------|
| State of Michigan | | P.O. Box 30498 | Lansing, MI 48909-7948 | 05-03-005-001-00 | T30N, R6W 5 | N/2 E of Hwy & NE/4 SE/4 |
| State of Michigan | | P.O. Box 30498 | Lansing, MI 48909-7948 | 05-03-005-002-00 | T30N, R6W 5 | Pt SW/4 NW/4 |
| Michigan Dept. of Treasury | | P.O. Box 30028 | Lansing, MI 48909-7948 | 05-03-005-004-00 | T30N, R6W 5 | Pt NE/4 SW/4 |
| Jeffrey Swisher, Matt Swisher, Chris Swisher | | P.O. Box 111 | North Lawrence, OH 44666 | 05-03-005-005-00 | T30N, R6W 5 | Pt NE/4 SW/4 |
| Michigan Nature Association | | 2310 Science Parkway, Suite 100 | Okemos, MI 48864 | 05-03-005-007-00 | T30N, R6W 5 | SE/4 SW/4 |
| Michigan Dept. of Treasury | Finance & Acct Div - PILT | P.O. Box 30722 | Lansing, MI 48909 | 05-03-005-009-00 | T30N, R6W 5 | SE/4 SE/4 & Pt SW/4 SE/4 |
| DNRE | | P.O. Box 30028 | Lansing, MI 48909-8235 | 05-03-005-010-00 | T30N, R6W 5 | W/4 SW/4 SE/4 |
| Michigan Dept. of Treasury | Finance & Acct Div - PILT | P.O. Box 30722 | Lansing, MI 48909 | 05-03-006-003-00 | T30N, R6W 6 | Pt N/2 S/2 N/2 |
| State of Michigan | | P.O. Box 30498 | Lansing, MI 48909-7948 | 05-03-006-004-00 | T30N, R6W 6 | Pt SE/4 NE/4 |
| State of Michigan | | P.O. Box 30498 | Lansing, MI 48909-7948 | 05-03-006-005-00 | T30N, R6W 6 | Pt SE/4 NE/4 |
| DNRE | | P.O. Box 30028 | Lansing, MI 48909-8235 | 05-03-006-008-00 | T30N, R6W 6 | Pt S/2 S/2 N/2 |
| State of Michigan | | P.O. Box 30498 | Lansing, MI 48909-7948 | 05-03-006-009-00 | T30N, R6W 6 | Pt S/2 S/2 N/2 |
| State of Michigan | | P.O. Box 30498 | Lansing, MI 48909-7948 | 05-03-008-001-00 | T30N, R6W 8 | E/2 E/2 |
| State of Michigan | | P.O. Box 30498 | Lansing, MI 48909-7948 | 05-03-009-001-00 | T30N, R6W 9 | Entire Section |
| State of Michigan | | P.O. Box 30498 | Lansing, MI 48909-7948 | 05-03-016-001-00 | T30N, R6W 16 | Entire Section exc SW/4 SW/4 |
| Michigan Dept. of Treasury | Finance & Acct Div - PILT | P.O. Box 30722 | Lansing, MI 48909 | 05-05-036-007-00 | T31N, R7W 36 | S/2 N of RR ROW |
| Michigan Dept. of Treasury | Finance & Acct Div - PILT | P.O. Box 30722 | Lansing, MI 48909 | 05-05-036-007-00 | T31N, R7W 36 | S/2 N of RR ROW |
| DNRE | | P.O. Box 30028 | Lansing, MI 48909-8235 | 05-05-036-009-00 | T31N, R7W 36 | SE/4 S of abandoned RR |
| State of Michigan | | P.O. Box 30498 | Lansing, MI 48909 | 05-09-031-008-00 | T31N, R6W 31 | S/2 SW/4 exc abandoned RR |
| State of Michigan | | P.O. Box 30498 | Lansing, MI 48909 | 05-09-031-016-00 | T31N, R6W 31 | Abandoned RR over S/2 SW/4 |
| Pole Star LLC | | P.O. Box 712 | Eastport, MI 49627 | 05-10-001-001-00 | T30N, R7W 1 | S/2 & S/2 S/2 N/2 w/ exceptions |
| Pole Star LLC | | P.O. Box 712 | Eastport, MI 49627 | 05-10-001-001-00 | T30N, R7W 1 | S/2 & S/2 S/2 N/2 w/ exceptions |
| Pole Star LLC | | P.O. Box 712 | Eastport, MI 49627 | 05-10-001-001-00 | T30N, R7W 1 | S/2 & S/2 S/2 N/2 w/ exceptions |
| DNRE | | P.O. Box 30028 | Lansing, MI 48909-8235 | 05-10-001-004-00 | T30N, R7W 1 | Part Nfr13/4 N/2 & part S/2 S/2 N/2 |
| DNRE | | P.O. Box 30028 | Lansing, MI 48909-8235 | 05-10-001-004-00 | T30N, R7W 1 | Part Nfr13/4 N/2 & part S/2 S/2 N/2 |
| DNRE | | P.O. Box 30028 | Lansing, MI 48909-8235 | 05-10-001-004-00 | T30N, R7W 1 | Part Nfr13/4 N/2 & part S/2 S/2 N/2 |
| Michigan Dept. of Treasury | Finance & Acct Div - PILT | P.O. Box 30722 | Lansing, MI 48909 | 05-10-002-001-00 | T30N, R7W 2 | E3/4 N3/4 N&W (& incl) RR ROW |
| James H. Coon & Marilyn C. Coon Trust | | 3667 E. 7 Mile Road | White Cloud, MI 49349 | 05-10-002-005-01 | T30N, R7W 2 | Pt SW/4 SW/4 |
| John L. Simonson | Tina M. Simonson | 10296 N-86 | Faye Lake, MI 49633 | 05-10-002-005-10 | T30N, R7W 2 | Pt SW/4 SW/4 |
| Cherub Joint Trust | | P.O. Box 362 | Gaylord, MI 49734 | 05-10-002-005-20 | T30N, R7W 2 | Pt SW/4 |
| Michael I. Laduc | Jennifer Lucad | 11015 Shoreside Drive | Davisburg, MI 48350 | 05-10-002-006-00 | T30N, R7W 2 | Pt SE/4 SW/4 |
| DNRE | | P.O. Box 30028 | Lansing, MI 48909-8235 | 05-10-002-007-00 | T30N, R7W 2 | Entire Section S&E of RR ROW |
| James H. Coon & Marilyn C. Coon Trust | | 3667 E. 7 Mile Road | White Cloud, MI 49349 | 05-10-003-007-10 | T30N, R7W 3 | Pt SE/4 SE/4 |
| William F. Jordan | Frances C. Jordan | 7597 Cottage Drive | Bellaire, MI 49615 | 05-10-003-011-00 | T30N, R7W 3 | Pt SE/4 |
| Rosemary Kornacki | | 4648 Rivers Edge Drive | Troy, MI 48068 | 05-10-010-001-00 | T30N, R7W 10 | NE/4 NE/4 exc abandoned RR |

| Name #1 | Name #2 | Address | City/State/Zip | Tax ID # | Town/Range/Section | Brief Legal |
|--|--|-------------------------------|----------------------------|--|--------------------|---|
| Michael Duve | Nancy Duve | 2280 Kladder Road | Bellaire, MI 49615 | 05-10-010-004-00 | T30N, R7W 10 | Pt S/2 NE/4 |
| Phyllis Johnston, Teresa Ray | Dale G. Reeves Jr., Sheila M. Reeves | 2247 Kladder Road | Bellaire, MI 49615 | 05-10-010-005-00 | T30N, R7W 10 | Pt W/2 NE/4 SE/4 |
| Frederick J. Anderson | | 1891 Montgomery Road | Bellaire, MI 49615 | 05-10-010-005-10 | T30N, R7W 10 | Pt NE/4 SE/4 |
| Stephen D. Buck | Debra Buck | 14211 Harrison Road | Romulus, MI 48174 | 05-10-010-005-20 | T30N, R7W 10 | Pt E/2 NE/4 SE/4 |
| Roger Huckle | | 622 Trinity Street | Lockhart, TX 78644 | 05-10-010-006-00 | T30N, R7W 10 | Pt SE/4 NE/4 |
| Raymond A. Harkabusic | Barbara Harkabusic | P.O. Box 1028 | Bellaire, MI 49615 | 05-10-010-008-00 | T30N, R7W 10 | Pt SE/4 NE/4 |
| Patrick A. Lacy | Barbara J. Lacy | 2194 Kladder Road | Bellaire, MI 49615 | 05-10-010-009-00 | T30N, R7W 10 | Pt SE/4 NE/4 |
| State of Michigan | | P.O. Box 30448 | Lansing, MI 48909 | 05-10-010-021-00 | T30N, R7W 10 | Abandoned RR over E/2 NE/4 |
| DNRE | | P.O. Box 30028 | Lansing, MI 48909-8235 | 05-10-011-005-00 | T30N, R7W 11 | W/2 SW/4 exc RR ROW exc SW/4 SW/4 |
| State of Michigan | | P.O. Box 30448 | Lansing, MI 48909-7948 | 05-10-011-006-00 | T30N, R7W 11 | SW/4 SW/4 |
| Arthur Koutnik | Roberta Koutnik | P.O. Box 121 | Bellaire, MI 49615 | 05-10-014-001-00 | T30N, R7W 14 | Pt NE/4 NE/4 |
| Arthur Koutnik | Roberta Koutnik | P.O. Box 121 | Bellaire, MI 49615 | 05-10-014-001-00 | T30N, R7W 14 | Pt NE/4 NE/4 |
| Steven P. Tucker | Diana J. Tucker | P.O. Box 810 | Bellaire, MI 49615 | 05-10-014-006-00 | T30N, R7W 14 | W/2 NW/4 NE/4 |
| Steven P. Tucker | Diana J. Tucker | P.O. Box 810 | Bellaire, MI 49615 | 05-10-014-006-00 | T30N, R7W 14 | W/2 NW/4 NE/4 |
| William G. Inn | Kathleen S. Inn | 1355 Bush Road | Bellaire, MI 49615 | 05-10-014-007-00 | T30N, R7W 14 | E/2 NW/4 NE/4 |
| William G. Inn | Kathleen S. Inn | 1355 Bush Road | Bellaire, MI 49615 | 05-10-014-007-00 | T30N, R7W 14 | E/2 NW/4 NE/4 |
| Arthur Koutnik | Roberta Koutnik | P.O. Box 121 | Bellaire, MI 49615 | 05-10-014-008-00 | T30N, R7W 14 | Pt NE/4 NE/4 |
| Arthur Koutnik | Roberta Koutnik | P.O. Box 121 | Bellaire, MI 49615 | 05-10-014-008-00 | T30N, R7W 14 | Pt NE/4 NE/4 |
| Raymond E. Moore | Judith A. Moore | 1245 Bush Road | Bellaire, MI 49615 | 05-10-014-009-00 | T30N, R7W 14 | Pt NE/4 NE/4 |
| Steven E. Rounds | | 1013 Bush Road | Bellaire, MI 49615 | 05-10-014-010-00 | T30N, R7W 14 | Pt SE/4 NE/4 |
| Dean Land Group LLC | | 4 Appleshire Court | Freeland, MI 48623 | 05-10-014-011-00 | T30N, R7W 14 | Pt NW/4 E of RR ROW |
| Dean Land Group LLC | | 4 Appleshire Court | Freeland, MI 48623 | 05-10-014-011-00 | T30N, R7W 14 | Pt NW/4 E of RR ROW |
| Richard M. Moran | Barbara L. Moran | 1705 Bush Road | Bellaire, MI 49615 | 05-10-014-012-00 | T30N, R7W 14 | E/2 E/2 NE/4 NW/4 |
| Richard M. Moran | Barbara L. Moran | 1705 Bush Road | Bellaire, MI 49615 | 05-10-014-012-00 | T30N, R7W 14 | E/2 E/2 NE/4 NW/4 |
| Trudy Knip | | P.O. Box 1069 | Grayling, MI 49738 | 05-10-014-012-00; 05-10-014-012-20 | T30N, R7W 14 | E/2 E/2 NE/4 NW/4 |
| Arthella Trowbridge | | 211 W. Forest Home Ave | Bellaire, MI 49615 | 05-10-014-012-00; 05-10-014-012-20 | T30N, R7W 14 | E/2 E/2 NE/4 NW/4 |
| Arthella Trowbridge | | 613 E. Broad Street | Bellaire, MI 49615 | 05-10-014-012-00; 05-10-014-012-20 | T30N, R7W 14 | E/2 E/2 NE/4 NW/4 |
| Mariene Vajda | | P.O. Box 56 | Bellaire, MI 49615 | 05-10-014-012-00; 05-10-014-012-20 | T30N, R7W 14 | E/2 E/2 NE/4 NW/4 |
| Ruby Miller | | 117 Maple Street | River Rouge, MI 48218 | 05-10-014-012-00; 05-10-014-012-20 | T30N, R7W 14 | E/2 E/2 NE/4 NW/4 |
| Jill Hines | | P.O. Box 263 | Central Lake, MI 9622 | 05-10-014-012-00; 05-10-014-012-20 | T30N, R7W 14 | E/2 E/2 NE/4 NW/4 |
| Marvin Trowbridge | | 612 E. Broad Street | Bellaire, MI 49615 | 05-10-014-012-00; 05-10-014-012-20 | T30N, R7W 14 | E/2 E/2 NE/4 NW/4 |
| Devier Trowbridge | | 211 W. Forest Home Ave | Bellaire, MI 49615 | 05-10-014-012-00; 05-10-014-012-20 | T30N, R7W 14 | E/2 E/2 NE/4 NW/4 |
| Roy Trowbridge | | 5925 Fishermans Paradise Road | Bellaire, MI 49615 | 05-10-014-012-00; 05-10-014-012-20 | T30N, R7W 14 | E/2 E/2 NE/4 NW/4 |
| Albert A. Sieniarski | Karl M. Sieniarski | 1811 Bush Road | Bellaire, MI 49615 | 05-10-014-012-15 | T30N, R7W 14 | Pt NE/4 NW/4 |
| Albert A. Sieniarski | Karl M. Sieniarski | 1811 Bush Road | Bellaire, MI 49615 | 05-10-014-012-15 | T30N, R7W 14 | Pt NE/4 NW/4 |
| Albert A. Sieniarski | Karl M. Sieniarski | 1811 Bush Road | Bellaire, MI 49615 | 05-10-014-012-15 | T30N, R7W 14 | Pt NE/4 NW/4 |
| Michael Cool | Kristine Cool | P.O. Box 946 | Bellaire, MI 49615 | 05-10-014-012-20 | T30N, R7W 14 | Pt NE/4 NW/4 |
| Michael Cool | Kristine Cool | P.O. Box 946 | Bellaire, MI 49615 | 05-10-014-012-20 | T30N, R7W 14 | Pt NE/4 NW/4 |
| Paul E. Dean & Janet M. Dean Trust | | 40 Appleshire Court | Freeland, MI 48623 | 05-10-014-013-00 | T30N, R7W 14 | NW/4 W of RR ROW |
| Paul E. Dean & Janet M. Dean Trust | | 40 Appleshire Court | Freeland, MI 48623 | 05-10-014-013-00 | T30N, R7W 14 | NW/4 W of RR ROW |
| Agribank, FCB | | P.O. Box 64949 | St. Paul, MN 55164-0949 | | T30N, R7W 14 | NE/4 exc 1 acre in SE corner |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T31N, R7W 36 | S/2 N of RR ROW |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T31N, R7W 36 | S/2 N of RR ROW |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T31N, R6W 31 | S/2 SW/4 exc abandoned RR |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T31N, R6W 31 | Abandoned RR over S/2 SW/4 |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T30N, R7W 1 | S/2 & S/2 S/2 N/2 w/ exceptions |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T30N, R7W 1 | Part Nfr3/4 N/2 & part S/2 S/2 N/2 |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T30N, R7W 3 | Pt SE/4 SE/4 |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T30N, R7W 3 | Pt SE/4 |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T30N, R7W 10 | NE/4 NE/4 exc abandoned RR |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T30N, R7W 10 | Abandoned RR over E/2 NE/4 |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T30N, R7W 14 | NW/4 W of RR ROW |
| BURNETT, DARWON A. ET AL | P.O. Box 988 | | Bellaire, MI 49615-0988 | | T30N, R6W 5 | NW/4 SW/4 LYING WEST OF HWY. M-32 |
| State of Michigan | | P.O. Box 30448 | Lansing, MI 48909-7948 | 05-03-005-001-00 | T30N, R6W 5 | NW/4 SW/4 LYING EAST OF HWY. M-32 |
| Agribank, FCB | | P.O. Box 64949 | St. Paul, MN 55164-0949 | | T30N, R7W 13 | N/2N/2, SE/4 |
| Schultz, Mikel; Schultz, Vincent & Schultz, Bradle | 1701 W Maplehurst Lane | | Roscommon, MI 48653 | 05-10-013-001-00 | T30N, R7W 13 | NE/4 |
| Koutnik, Arthur (DC) & Roberta | 1288 Bush Road | | Bellaire, MI 49615 | 05-10-013-003-00 | T30N, R7W 13 | NW/4 exc the W 462' of S 495' |
| Porter Mineral Right Trust | Old Kent Bank & Trust Company, Trustee One Vandenberg Square | | Grand Rapids, MI 49503 | | T30N, R6W 17 | N/2SE/4 |
| Stephen Anderson | P.O. Box 136 | | Reed City, MI 49677-0136 | | T30N, R6W 17 | |
| Michigan Consolidated Gas Company | PROPERTY TAX DEPT | P O BOX 33017 | DETROIT, MI 48232 | 05-03-017-006-00 | T30N, R6W 17 | Pt N/2SW/4 |
| DAVIS, WILLIAM W. & DOLORES L. | 6180 FOX RUN DR | | GRAYLING, MI 49738 | 05-03-017-005-00 | T30N, R6W 17 | N/2 SW/4, EXCEPT COM AT SW COR OF SEC |
| Allen, James B. & Renee J. | 234 E Eddy School Road | | Mancelona, MI 49659 | 05-03-018-004-10, 05-03-018-007-00, 05-03-018-007-05 | T30N, R6W 18 | Part W/2SW/4 |
| BANWELL, BRUCE E. & CYNTHIA D. | 569 E Eddy School Road | | Mancelona, MI 49659 | | T30N, R6W 18 | NE/4 SW/4; W/2 W/2 NW/4 SE/4; W/2 E/2 W/2 NW/4 SE/4 |
| GOWER, JOHN S. & DARLENE K. | 623 E Eddy School Road | | Mancelona, MI 49659 | 05-03-018-007-00 | T30N, R6W 18 | W/2 E/2 NW/4 SE/4; E/2 E/2 W/2 NW/4 SE/4 |
| Moore, Emil L. | 116 Ullith Ln | | Summerville, SC 29485 | 05-03-018-007-20 | T30N, R6W 18 | E/2 E/2 NW/4 SE/4 |
| Dewitt, John; Dewitt, Douglas | 104 Paradise Harbour Blvd Apt 302 | | North Palm Beach, FL 33408 | 05-03-018-006-00 | T30N, R6W 18 | Part of the NE/4SE/4 |
| STEENBERGH, FRANKLIN DELANO, ET UX | 975 E Eddy School Road | | Mancelona, MI 49659 | 05-03-018-006-10 | T30N, R6W 18 | PART NE/4 SE/4 |
| STEENBERGH, FRANKLIN DELANO, ET UX | 975 E Eddy School Road | | Mancelona, MI 49659 | 05-03-018-006-10 | T30N, R6W 18 | PART NE/4 SE/4 |
| MASON, H. DWIGHT & DALE LYNN | 403 Barnum | | Dundee, MI 48131 | 05-03-018-006-30 | T30N, R6W 18 | PART NE/4 SE/4 |
| Fournier, Michael D. & Cheryl M. | 2845 Ila Drive | | National City, MI 48748 | 05-03-018-006-25 | T30N, R6W 18 | PART NE/4 SE/4 |
| Buckwheat, Braverd & Donna | P.O. Box 518 | | Mancelona, MI 49659 | 05-03-018-006-20 | T30N, R6W 18 | PART NE/4 SE/4 |

UNITIZATION AGREEMENT

CHESTONIA 18 UNIT (CHESS PLAY UNIT)

STATE OF MICHIGAN)
)
COUNTY OF ANTRIM)

This Agreement, made and entered into as of the ~~28~~th day of June, 1994, by and between Lee's Petroleum L.L.C., a Michigan limited liability corporation of P.O. Box 213, Acme, Michigan 49610, and all other parties owning Oil and Gas Rights in the Unitized Area who execute either this Agreement or an instrument ratifying and adopting the provisions of this Agreement.

WITNESS

Whereas, the parties to this Agreement own Oil and Gas rights in the Unitized Area; and

Whereas, the parties to this Agreement desire to encourage exploration and development of the Unitized Area by enabling the use of common gathering lines, separators, water disposal, compression and other producing facilities, and to that end they desire to provide for the exploration and for the development and production of Unitized Substances in and from the Unitized Area on a unitized basis;

Now, Therefore, in consideration of the premises and of the mutual agreements herein contained, it is agreed as follows:

ARTICLE I

DEFINITIONS:

1.1. The term "Interest Owner" as used in this Agreement means an owner of Oil and Gas Rights in the Unitized Area who is a party to this Agreement, or such owner's successor in interest.

1.2. The term "Oil and Gas Rights" as used in this Agreement means the rights to explore, develop and operate lands within the Unitized Area for the production of Unitized Substances pursuant to Unitized Leases, or to share in the production so obtained or the proceeds thereof. Said term includes the contractual right or option to acquire any such rights.

1.3. The term "Operator" as used in this Agreement means Lee's Petroleum L.L.C., or its successors in the capacity of Operator of the Unitized Area pursuant to the applicable Operating Agreement.

1.4. The term "Unitized Area" as used in this Agreement means all Unitized Formations within the following lands:

Township 30 North, Range 6 West, Chestonia Township, Antrim County Michigan:

| | |
|-------------|---|
| Section 5: | The West-half of the Southwest-Quarter; |
| Section 6: | The South-half; |
| Section 7: | The Entire Section; |
| Section 8: | The West Three-quarters of the Section; |
| Section 16: | The Southwest-quarter of the Southwest-quarter; |
| Section 17: | The Entire Section; |
| Section 18: | The Entire Section; |

Township 30 North, Range 7 West, Kearney Township (East Part), Antrim County Michigan:

| | |
|-------------|---|
| Section 1: | The South Three-quarters of the Section; |
| Section 11: | The Southeast-quarter and the East-half of the Southwest-quarter; |
| Section 12: | The Entire Section; |
| Section 13: | The North-half and the Southeast-quarter and the North-half of the Southwest-quarter; |

provided, however, that Operator is authorized, at any time and from time to time subsequent to 36 months from the date of this Agreement, to delete any quarter-quarter section of land from the Unitized Area if and whenever (1)(a) there is at that time no well on such quarter-quarter section, which, in the opinion of the Operator, is capable of producing any of the Unitized Substances in paying quantities and (b) the owners of those Oil and Gas Rights within such quarter-quarter section which have become subject to this Agreement as of that time, if any, shall have requested or consented to the deletion of such lands from the Unitized Area, or (2) Operator has been unable to secure the



consent by the Interest Owner. All Oil and Gas Rights within such quarter-section to the terms of this Agreement. Any such deletion of lands by Operator as aforesaid shall be effected by filing for record in the Office of the Register of Deeds for Antrim County, Michigan, a declaration or affidavit setting forth such deletion of lands from the Unitized Area subject to this Agreement.

1.5. The term "Unitized Formations" as used in this Agreement means all formations and strata between the surface of the earth and the base of the Antrim Formation, together with the right to dispose of produced brine and other effluent in formations below the bottom of the Antrim Formation.

1.6. The term "Unitized Lease" means each of the following oil and gas leases, insofar only as they cover lands and formations within the Unitized Area:

(a) All oil and gas leases covering lands within the Unitized area which Operator now owns in whole or in part or which Operator acquires in whole or in part at any time within three years from the date of this Agreement, but only insofar as such leases cover lands as to which Operator owns, or acquires within said three years, the entire leasehold interest or an undivided fractional share of the leasehold interest; and

(b) All oil and gas leases covering lands within the Unitized Areas to which Operator now has, or acquires at any time within three years from the date of this Agreement, a farmout agreement or other contractual arrangement giving Operator exploration and development rights as to the Unitized Formations; provided, however, that if Operator's exploration and development rights expire or Operator's interest terminates as to any such lease or part thereof, by reason of Operator's not having met the conditions necessary to earn or retain same under the terms of the applicable farmout agreement or other contractual arrangement, such lease or part thereof shall not thereafter be subject to this Agreement or deemed a Unitized Lease unless either (1) Operator acquires a subsequent farmout agreement or other contractual arrangement covering such lease at any time within three years from the date of this Agreement, or (2) such lease becomes a Unitized Lease pursuant to subsection (a) above or subsection (c) below; and

(c) All oil and gas leases covering lands within the Unitized Area which are subject to an operating agreement entered into by Operator and other persons at any time during the term of this Agreement, if and insofar as Operator and all other parties to such operating agreement agree to commit any such lease to this Agreement as a Unitized Lease hereunder;

Operator may from time to time prepare and attach to this Agreement an Exhibit A and supplements thereto identifying specifically the oil and gas leases, or portions thereof, subject to this Agreement.

1.7. The term "Unitized Substances" as used in this Agreement means all oil, gas and other hydrocarbons, and any associated sulfur and other minerals in and under and which may be produced from the Unitized Area.

ARTICLE II

CREATION AND EFFECT OF UNIT

2.1. All Oil and Gas rights of the parties to this Agreement in the Unitized Area are hereby pooled, consolidated and unitized into a single unit for the operation for and development and production of Unitized Substances.

2.2. The provisions of the Unitized Leases and the various agreements and other instruments pertaining to the Oil and Gas Rights of the Interest Owners in the Unitized Area are amended to the extent necessary to make them conform to the provisions of this Agreement, but otherwise shall remain in full force and effect.

2.3. Any well drilled by Operator on the Unitized Area pursuant to the terms of any Unitized Lease and all operations with respect to any such well, and all production therefrom, shall be considered to be a well drilled and operations and production under the terms of each and every Unitized Lease for all purposes pertaining to the Unitized Leases, except determining payment of royalty.

2.4. All wells drilled on the Unitized Area shall be considered to be, and shall be treated as, only one single well for purposes of computing any shut-in royalty payable under any Unitized Leases; and where Unitized Leases provide for calculation of shut-in royalty on the basis of a specified amount per acre, then, notwithstanding any provision contained in Unitized Leases, the number of acres utilized for the purposes of the calculation of the payment of the shut-in royalty payable under any such Unitized Lease shall be the number of net mineral acres within the Unitized Area which are subject to such Unitized Lease.

2.5. Nothing in this Agreement shall be construed to result in the transfer of title to any Oil and Gas Rights by any Interest Owner to any other Interest Owner.



2.6. Operator is granted the right to inject any substances into the formations within the Unitized Area, in whatever amounts Operator deems expedient for unit operations, together with the right to drill, use and maintain injection wells on the Unitized Area and to use for injection purposes any non-producing or abandoned wells or dry holes, and any producing wells completed in the Unitized Formations, without liability for any damage to the Unitized Formations.

2.7. There shall be no obligation on the part of Operator to drill offset wells on separate tracts into which the lands in the Unitized Area are now divided or may hereafter be divided, nor to keep, maintain or store Unitized Substances produced from any part of the Unitized Area separately or apart from the Unitized Substances produced from any other part of the Unitized Area.

2.8. There shall be no obligation on the part of Operator to meter separately the production of Unitized Substances from the individual wells within the Unitized Area. A master meter or metering facility may be utilized to measure the production of Unitized Substances from the wells within the Unitized Area on a combined basis for royalty purposes.

2.9. Operator may use or consume Unitized Substances for unit operations, including but not limited to the injection thereof into the Unitized Formations. No royalty, overriding royalty, production or other payments shall be payable on account of Unitized Substances used, lost or consumed in unit operations.

ARTICLE III ALLOCATION OF UNITIZED SUBSTANCES

3.1. An equal share of all unitized Substances produced from the Unitized Area pursuant to Unitized Leases shall be allocated to each government surveyed quarter-quarter section of land within the Unitized Area; provided, however, that a fractional quarter-quarter section of land shall be allocated only a fraction of a share of such Unitized Substances, the numerator of which fraction shall be the number of acres in such fractional quarter-quarter section of land, as indicated by the government survey or other survey, and the denominator of which shall be 40; and further provided, however, that as to any quarter-quarter section of land in which the Oil and Gas Rights subject to this Agreement do not include the entire interest in Oil and Gas in the Unitized Formations in such quarter-quarter section of land, the share that would otherwise be allocated to such quarter-quarter section of land shall be reduced to that proportionate part of such share which is represented by a fraction, the numerator of which shall be the number of net mineral acres in such quarter-quarter section which are subject to this Agreement and the denominator of which shall be 40 (unless the quarter-quarter section is a fractional quarter-quarter section, in which case the denominator shall be the number of acres in such fractional quarter-quarter section as indicated by the government survey or other survey). The amount of Unitized Substances thus allocated to each such quarter-quarter section of land, regardless of whether the amount is more or less than the actual production of Unitized Substances, if any, from the well or wells on such quarter-quarter section, shall be deemed for all purposes to have been produced therefrom.

3.2. The Unitized Substances allocated to each quarter-quarter section of land shall be distributed among, or accounted for to, the persons entitled to share in the production from such quarter-quarter section in the same manner, in the same proportions, and upon the same conditions, as they would have shared in the production from such quarter-quarter section, or in the proceeds thereof, had this Agreement not been entered into. If any Oil and Gas Rights in the quarter-quarter section are owned in severalty as to different parts thereof, the owners of the divided interests, in the absence of any agreement providing for a different division, shall share in the Unitized Substances allocated to the quarter-quarter section, or in the proceeds thereof, in proportion to the surface acreage of their respective parts of the quarter-quarter section.

3.3. Nothing contained in this Agreement shall affect or change the ownership of any shut-in royalty that may become payable under the terms of any of the Unitized Leases.

3.4. Nothing in this Agreement shall affect or change any otherwise agreed upon allocation of Unitized Substances as between working interest owners under Unitized Leases. In the event of any conflict between the provisions of this Agreement and the provisions of any Operating Agreement or other agreement between working interest owners under Unitized Leases, the provisions of such Operating Agreement or other agreement shall control as between the parties thereto and their successors in interest.

ARTICLE IV EASEMENTS

4.1. The parties to this Agreement, to the extent of their respective rights and interests, grant to Operator, for so long as this Agreement remains in effect, an easement to construct, operate, maintain, repair and replace pipelines across the Unitized Area for the purpose of transporting oil, gas and/or other fluids produced from the Unitized Area. The parties to this Agreement, to the extent of their rights and interests, also grant to Operator, for so long as this Agreement remains in effect, an easement to inject and dispose of, in formations above or below the base of the Antrim formation, salt water and other fluids produced in connection with the production of Unitized Substances.



ARTICLE V

ADDITION OF LANDS TO UNITIZED AREA

5.1. Subject to the approval of the Real Estate Division of the Department of Natural Resources, if Operator determines that additional lands should be included in the Unitized Area so as to more efficiently produce Unitized Substances in accordance with prudent oil and gas production practices, Section 1.4 of this Agreement shall thereby be amended to include said additional lands within the Unitized Area, subject to the terms of this Agreement.

ARTICLE VI

TERM OF AGREEMENT

6.1. This Agreement shall be effective as of the date of this Agreement, as above first written, and shall be and remain in full force and effect for the longer of (a) 36 months from the date of this Agreement, as above first written, or (b) until the last well producing Unitized Substances from the Unitized Area is plugged and abandoned; provided, however, that at any time when, in the opinion of Operator, there is no well in the Unitized Area capable of producing any of the Unitized Substances in paying quantities and no drilling or reworking operations are then being conducted thereon to obtain or restore production, Operator may terminate this Agreement by filing for record in the offices of the Register of Deeds for Antrim County, Michigan, a declaration or affidavit of termination of this Agreement.

ARTICLE VII

EXECUTION

7.1. An owner of Oil and Gas Rights may become a party to this Agreement by signing the original of this instrument, or a counterpart thereof, or other instrument ratifying and adopting the provisions of this Agreement. The execution of any such instrument shall have the same effect as if all parties had signed the same instrument.

ARTICLE VIII

GENERAL

8.1. Nothing in this Agreement shall be construed to create an association or to impose a partnership duty, obligation or liability with regard to any of the parties to this Agreement. Each party shall be individually responsible for such party's own obligations as provided for in this Agreement.

8.2. Any conveyance of an interest owned by any party to this Agreement in the Unitized Area shall be made expressly subject to this Agreement. No change in ownership shall be binding upon Operator, or upon any party to this Agreement other than the party so transferring, until the first day of the calendar month next succeeding the date of receipt by Operator of a copy of the recorded instrument evidencing such change in ownership.

8.3. If any part of this Agreement is declared invalid by any court or agency of competent jurisdiction, the remainder of this Agreement shall not be affected thereby.

8.4. If for any reason a person owning Oil and Gas Rights in the Unitized Area does not become a party to this Agreement, this Agreement shall nevertheless be effective as between all persons who do become parties to this Agreement.


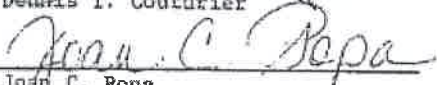
8.5. The terms and provisions of this Agreement shall constitute covenants running with and binding the land and leasehold estates, and shall be binding upon and inure to the benefit of the parties hereto, and their respective heirs, successors and assigns.

8.6. This Agreement shall be subject to all applicable laws, rules and regulations by the governmental authority having jurisdiction over the operations described herein, notwithstanding anything to the contrary contained herein.

8.7. The Operator shall provide the Real Estate Division in January of each year, a listing of the location and completion dates of the wells completed the previous year.

In Witness Whereof, this Agreement is executed as of the day and year first above written.

WITNESSES:


Dennis T. Couturier

Joan C. Papa

LEE'S PETROLEUM L.L.C.

By: 
T. Dwain Provins
President

Page 4 of 5 Pages.



LINE 4 13 PG. 1 14 6

OWNER:

STATE OF MICHIGAN)
COUNTY OF GRAND TRAVERSE)

On this 28 day of June, 1994, before me a notary public within and for the State and County aforesaid, personally appeared T. Dwain Provins, to me known to be the President of Lee's Petroleum L.L.C., a Michigan limited liability corporation on behalf of which he executed the foregoing instrument and acknowledged the same to be the free act and deed of said corporation.

Joan C. Papa
Joan C. Papa, Notary Public, Leelanau County, Michigan
Acting in Grand Traverse County, Michigan
My Commission expires June 29, 1997.

STATE OF MICHIGAN)
COUNTY OF _____)

The foregoing instrument was acknowledged before me this _____ day of _____, 1994 by _____

My commission expires: _____ Notary Public, _____ County

Prepared By: Patrick J. Riley, P.O. Box 173, Jackson, MI 49204

ANTRIM COUNTY
MICHIGAN
RECEIVED FOR
96 JUL 18 PM 12:26
L. Barber, Q. C. Clerk
REGISTER OF DEEDS



CHESS PLAY

| | SPUD DATE | COMP DATE | MPSC DATE | ON LINE |
|--------------------|--------------|--------------|--------------|------------|
| 1 BURNETT A1-8 | 9/2/94 | 12/1/94 | 2/13/95 | 10/16/95 |
| 2 KUNZ B1-18 | 9/30/94 | 11/10/94 | 2/13/95 | 10/2/95 |
| 3 MOORE C3-11 | 7/23/94 | 8/3/94 | 10/24/95 | 10/24/95 |
| 4 GREEN RIVER D4-7 | 12/14/89 | 12/22/89 | 9/13/95 | 2/6/96 |
| 5 KUNZ B4-18 | 8/27/94 | 9/18/95 | 10/16/95 | 10/16/95 |
| 6 BURNETT A3-7 | 6/19/95 | 9/23/95 | 10/27/95 | 10/27/95 |
| 7 KAFI B4-12 | 6/20/95 | 9/26/95 | 10/27/95 | 11/27/95 |
| 8 BURNETT A1-7 | 3/27/95 | 9/30/95 | 10/27/95 | 10/27/95 |
| 9 BURNETT D3-12 | 6/18/95 | 9/29/95 | 10/27/95 | 12/13/95 |
| 10 KOTZ C2-11 | 6/16/95 | 9/28/95 | 10/27/95 | 12/10/95 |
| 11 KAFI B1-12 | 8/5/95 | 9/29/95 | 10/27/95 | 12/29/95 |
| 12 BURNETT D1-12 | 8/8/95 | 9/30/95 | 10/27/95 | 11/21/95 |
| 13 KOUTNIK B1-13 | 6/14/95 | 9/18/95 | 10/27/95 | 10/27/95 |
| 14 BURNETT C3-6 | 6/26/95 | 9/21/95 | 10/27/95 | 10/27/95 |
| 15 BURNETT D1-7 | 6/16/95 | 9/28/95 | 10/27/95 | 10/27/95 |
| 16 BURNETT C1-6 | 6/2/95 | 10/2/95 | 10/27/95 | 10/27/95 |
| 17 BURNETT D1-5 | 10/31/94 | 9/22/95 | 10/27/95 | 10/27/95 |
| 18 KAFI C3-1 | 6/24/95 | 10/2/95 | 11/22/95 | 11/22/95 |
| 19 STALL D4-18 | 7/3/95 | 11/20/95 | 12/19/95 | 1/13/96 |
| 20 KLADZYK D3-13 | 8/12/95 | 1/4/96 | 2/28/96 | 2/28/96 |
| 21 RANKIN D1-18 | 8/14/95 | 1/25/96 | 2/28/96 | 2/28/96 |
| 22 KAFI D1-1 | 2/17/96 | 3/13/96 | 4/26/96 | 4/26/96 |
| 23 DEVRIESE B3-8 | 10/10/95 | 3/4/96 | 5/29/96 | 5/29/96 |
| 24 KAFI C2-1 | 2/20/96 | 3/14/96 | 4/26/96 | 4/26/96 |
| 25 THOMPSON D3-8 | 9/2/95 | 2/27/96 | 5/1/96 | 5/1/96 |
| 26 GUSTAV D1-13 | 1/22/96 | 2/9/96 | 4/26/96 | 4/26/96 |
| 27 URBAN B4-17 | 8/25/95 | 3/29/96 | 5/1/96 | 5/1/96 |
| 28 URBAN C4-17 | 8/22/95 | 3/29/96 | 5/1/96 | 5/1/96 |
| 29 CUCA C3-8 | 8/30/95 | 3/30/96 | 5/1/96 | 5/1/96 |
| 30 RITT D1-16 | 8/20/95 | 3/25/96 | 5/1/96 | 5/1/96 |
| 31 WRIGHT A4-17 | 8/25/95 | 3/28/96 | 5/1/96 | 5/1/96 |



Instrument Liber Page
200800007647 OR 784 283

200800007647
Filed for Record in
ANTRIM COUNTY MICHIGAN
PATTY HIEPDTH - 268
09-09-2008 At 11:23 am.
046 AMEND 26.00
OR Liber 784 Page 283 - 286

FOURTH AMENDMENT OF UNITIZATION AGREEMENT (Chestonia 18 Unit)

WHEREAS, a Unitization Agreement dated June 28, 1994, recorded in Liber 413, Page 1143, et seq., a certain Amendment to Unitization Agreement, dated May 10, 1995, recorded in Liber 427, Page 1444, et seq., a certain Amendment to Unitization Agreement, dated January 25, 1996, recorded in Liber 440, Page 1343, et seq., and a certain Third Amendment to Unitization Agreement, dated April 24, 2007, effective May 15, 2007, recorded in Liber 767, Page 3016, et seq., were recorded in the office of the Register of Deeds for Antrim County, Michigan, hereinafter referred to as "Agreement," and

WHEREAS, Atlas Gas & Oil Company, LLC, ("Atlas"), a Michigan limited liability company, of 1501 Cass Street, Suite B, Traverse City, Michigan 49684 is the current operator of the Chestonia 18 Unit; and

WHEREAS, said Agreement, describes and establishes a "Unit Area" covering certain lands within Antrim County, Michigan to-wit:

Township 30 North - Range 6 West, Chestonia Township

Section 05: NE/4 SW/4, W/2 SW/4
Section 06: S/2
Section 07: Entire Section
Section 08: W 3/4
Section 16: SW/4 SW/4
Section 17: Entire Section
Section 18: Entire Section

Township 30 North - Range 7 West, Kearney Township

Section 01: S/2, S 440' of the NW/4, and that part of the SW/4 NW/4 lying West of the abandoned E.J. & S. Railroad Right of Way
Section 11: N/2, SE/4, E/2 SW/4
Section 12: Entire Section
Section 13: Entire Section

WHEREAS, Atlas desires to amend and reform the Unit Area for the Chestonia 18 Unit by adding thereto the following described lands:

Township 30 North - Range 7 West, Kearney Township

Section 1: NW/4 except the S 440', and except that part of the SW/4 NW/4 lying West of the abandoned E.J. & S. Railroad Right of Way

WHEREAS, Atlas desires to further amend and reform the Unitized Area for the Chestonia 18 Unit by deleting therefrom the following described lands.

Township 30 North - Range 6 West, Chestonia Township

Section 5: NE/4 SW/4

WHEREAS, said Agreement provides that Atlas may amend the Unit Area at any time, and may from time to time, prepare by separate instrument, a supplement to the Agreement identifying specifically the Unitized Leases, or portions thereof, subject to the Agreement.

NOW THEREFORE, pursuant to the terms of the Agreement and the terms of the Oil and Gas Leases described in Exhibit "A" hereto, the term "Unit Area" as used in the Agreement is hereby amended and reformed to read as follows:

Township 30 North - Range 6 West, Chestonia Township

Section 05: W/2 SW/4
Section 06: S/2
Section 07: Entire Section
Section 08: W 3/4
Section 16: SW/4 SW/4
Section 17: Entire Section
Section 18: Entire Section

Township 30 North - Range 7 West, Kearney Township

Section 01: NW/4, S/2
Section 11: N/2, SE/4, E/2 SW/4
Section 12: Entire Section
Section 13: Entire Section

NOW THEREFORE, the Oil and Gas Leases described in Exhibit "A" hereto cover lands within the Unit Area as amended and reformed herein, or portions thereof, and are hereby added to the Agreement and made subject to its terms, insofar and only insofar as such Oil and Gas Leases lie within the Unit Area.

EXCEPT as modified herein, all terms and conditions of the Agreement shall remain the same.

IN WITNESS WHEREOF, this Amendment of Unitization Agreement is dated and executed this 19th day of August 2008, and shall be effective August 1, 2008, however, the effective date for the commencement of royalty payments shall be two months after the first day of the month following the State of Michigan's ratification of this amendment, or the first day of the month production is established from the lands added herein, whichever occurs first.

WITNESSES:


James L. Stachnik

Paul R. Conlen
Paul R. Conlen

ATLAS GAS & OIL COMPANY, LLC

By: Richard L. Redmond, Jr.
Its: President & CEO

CORPORATE ACKNOWLEDGEMENT

STATE OF MICHIGAN)
) ss
COUNTY OF GRAND TRAVERSE)

The foregoing instrument was acknowledged before this 19th day of August 2008 by Richard L. Redmond, Jr., the President and CEO of Atlas Gas & Oil Company, LLC, a Michigan limited liability company, on behalf of the company.

My Commission Expires:
April 11, 2014

Michelle Schaub
Michelle Schaub, Notary Public
Grand Traverse County, Michigan
Acting in Grand Traverse County, MI

Prepared by: Atlas Gas & Oil Company, LLC
Douglas C. Crawford, RPL
1501 Cass Street, Suite B,
Traverse City, Michigan 49684

Return to: Atlas Gas & Oil Company, LLC
Attn: Carol Hector
1501 Cass Street, Suite B
Traverse City, Michigan 49684

Cheslonia 18 Fourth Amend.doc

EXHIBIT "A"

Attached to and made a part of that certain Fourth Amendment of Unitization Agreement dated August 13, 2008, effective August 1, 2008, covering the Chestonia 18 Unit

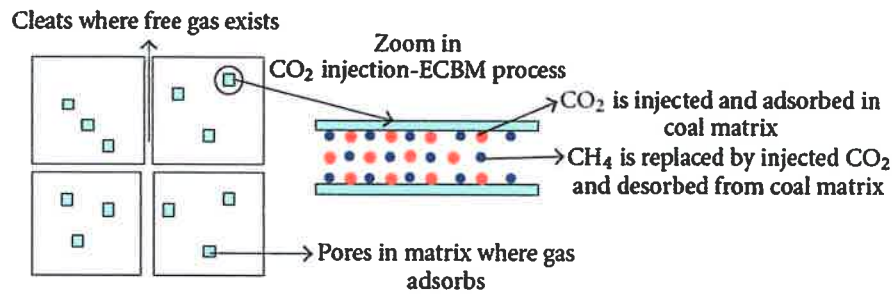
Lib 284 286
Instrument 200800007647

| LEASE NO. | LESSOR | LESSEE | LEASE DATE | LIBER | PAGE | TWP | RNG | SEC | DESCRIPTION |
|------------|---------------------------|------------------------------|------------|------------|------|-----|-----|-----|---|
| M008284600 | STATE OF MICHIGAN N-44439 | ATLAS GAS & OIL COMPANY, LLC | 07/14/08 | Unrecorded | 30N | 7W | 1 | | PART OF THE NW¼ |
| M008103900 | OLD KENT BANK AND TRUST | RONALD L WILLMES | 03/01/71 | 359 | 1372 | 30N | 7W | 1 | THAT PART OF THE NW¼ LYING WEST OF ABANDONED RR ROW |

IN SO FAR AND ONLY IN SO FAR AS THE ABOVE
LANDS AND LEASES LIE WITHIN THE UNIT AREA.

Exhibit C – CO₂ Absorption and Methane Desorption

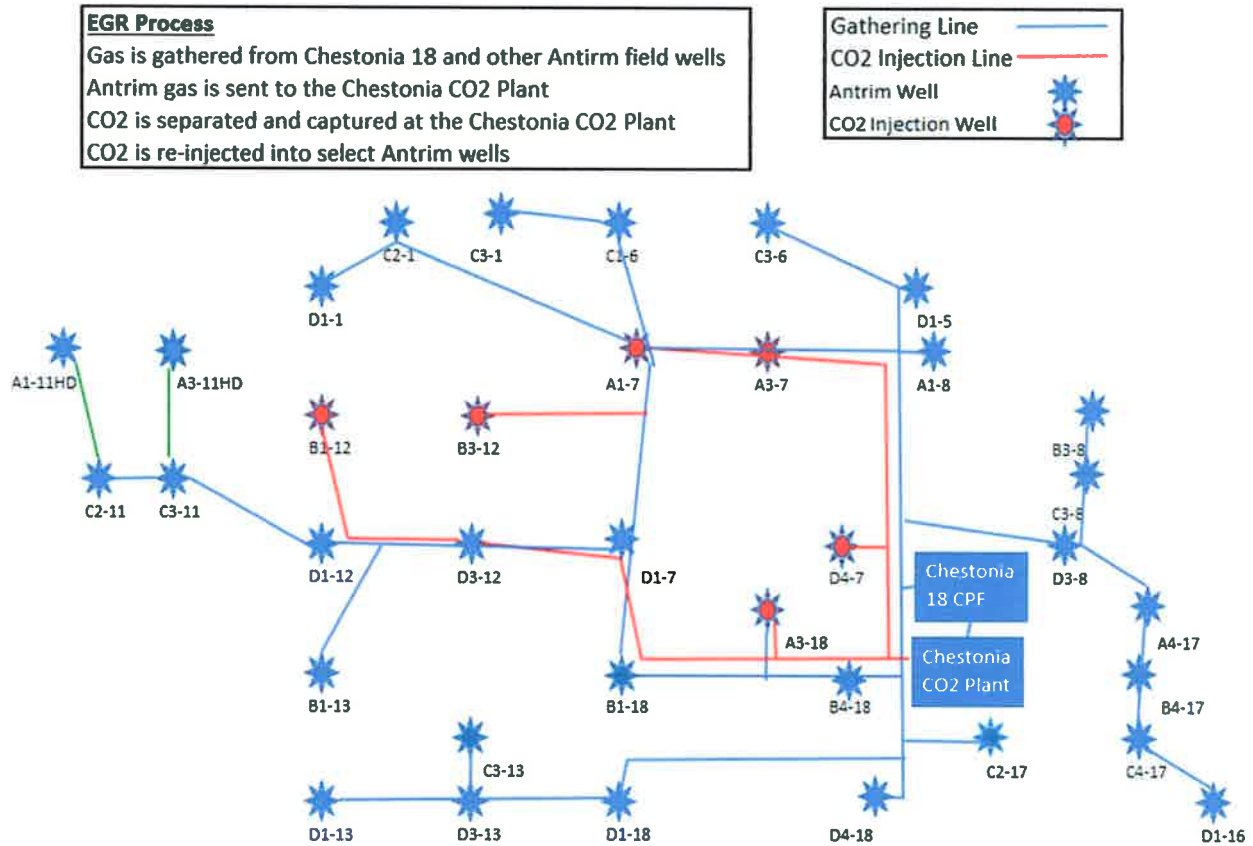
Journal of Petroleum Engineering



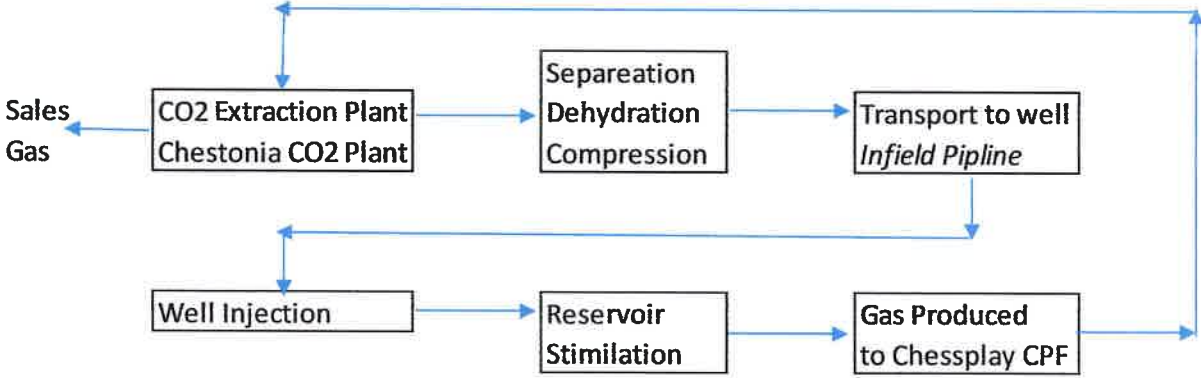
(Qin He, Shahab D. Mohaghegh, and Vida Gholami)

Exhibit D - Proposed Injection Wells & Facility Process
Diagram

CO2 Injection Process Diagram (Not to Scale)



Chestonia 18 Pool
CO2 EGR Project Process Diagram



Chestonia 18 Unit

Exhibit E – Cross Section Diagram

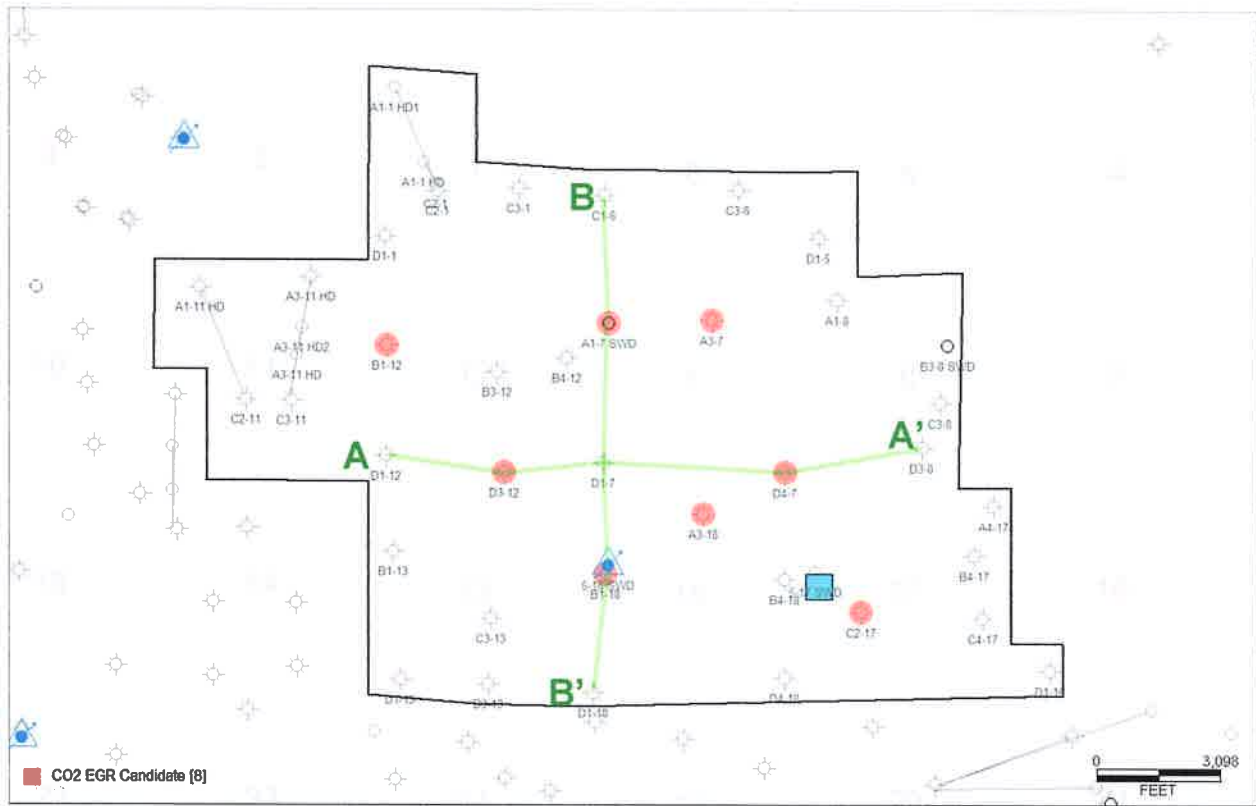


Figure 1. Base map of the Chestonia 18 Project, showing the project boundary outline (black), candidate wells for CO₂ injection (red), the Chestonia CO₂ processing plant (blue), and locations of two geologic cross-sections (green, A-A' and B-B', see figures 3 and 4).

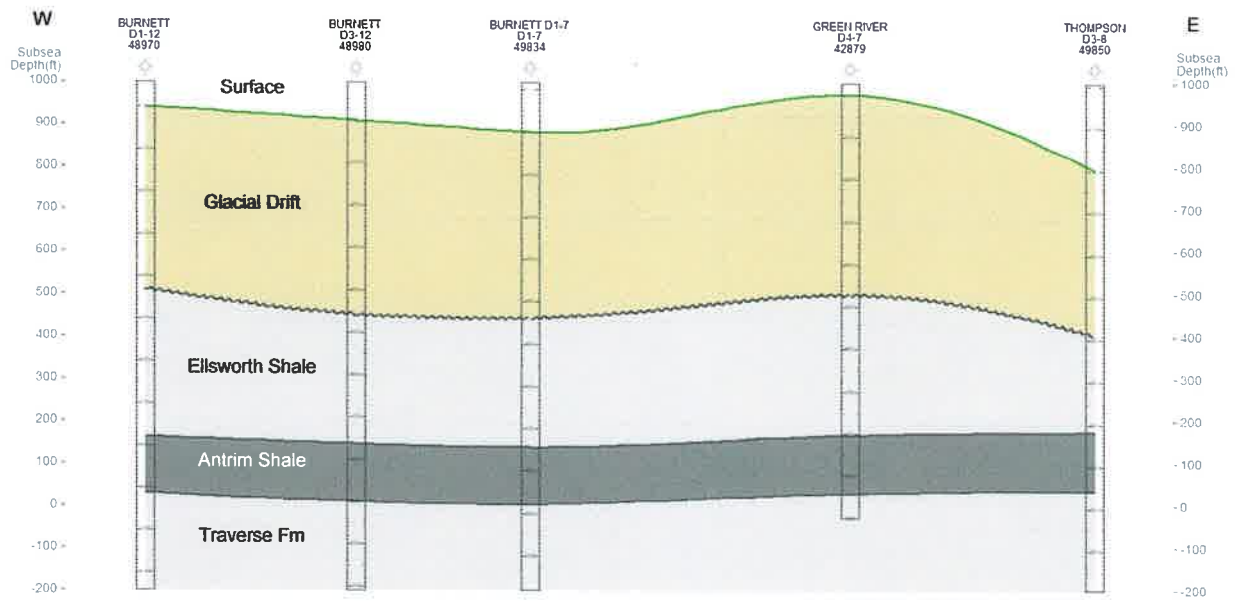


Figure 2. East-west cross-section of the Antrim Shale and overlaying strata at the Chestonia 18 Project.

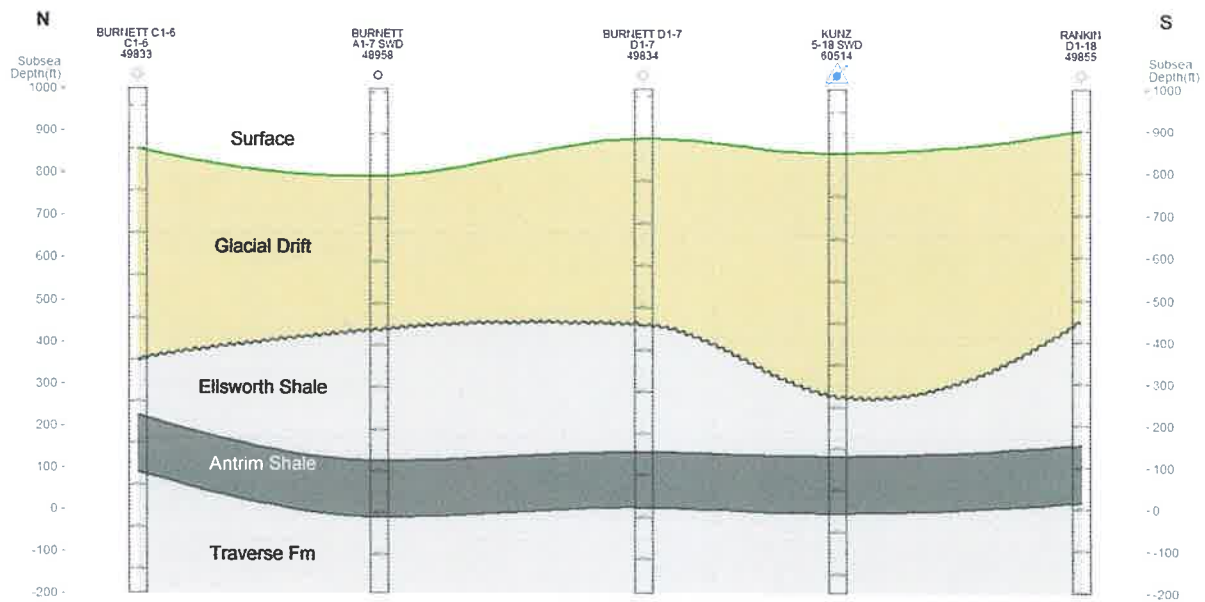
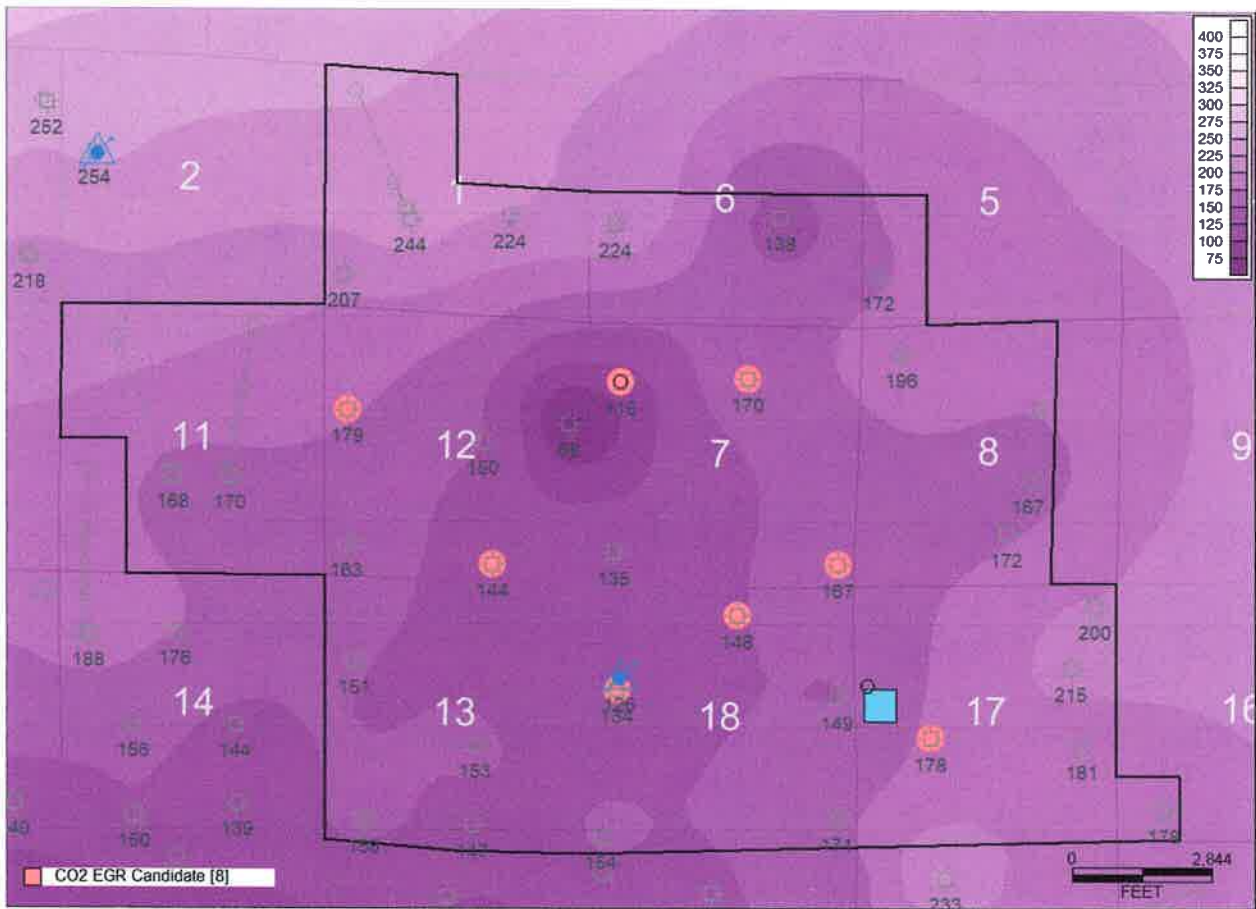


Figure 3. North-south cross-section of the Antrim Shale and overlaying strata at the Chestonia 18 Project.

Exhibit F – Structural Diagram



Chestonia 18 Unit - Structure map of the top of the Antrim Shale (C.I. = 25 ft). Structure data determined from well logs and driller's reports are posted at well symbols. Also shown are candidate wells for CO₂ EGR injection (red), and the Chestonia 18 CO₂ processing facility (blue).

Exhibit G – Primary Production

- Produced thru July 2019 - 8,372.96 MMcf

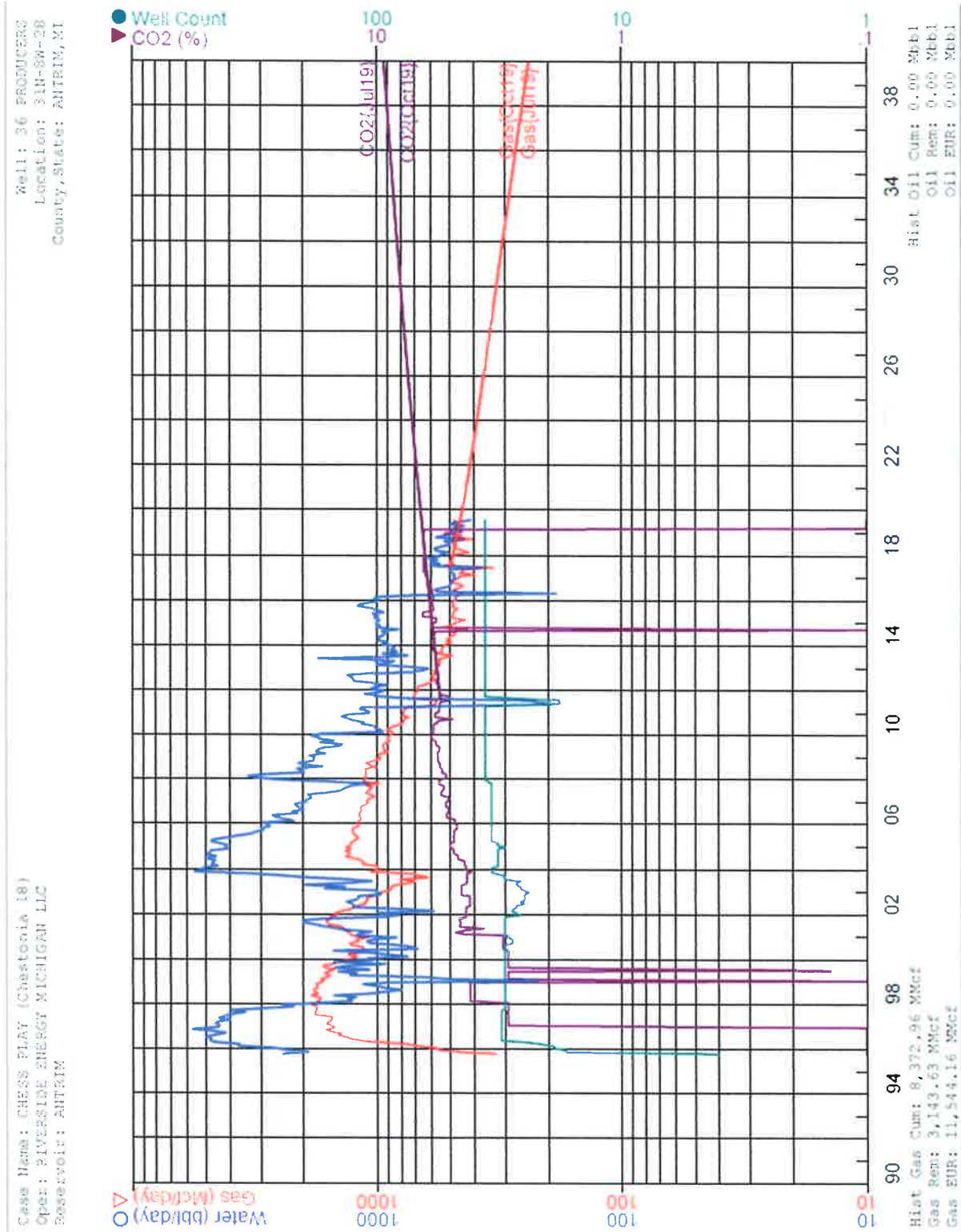


Exhibit H – Reservoir Properties

Chestonia 18 Unit

Initial Reservoir Pressure

- Antrim Shale pressure gradient range is .35 -.38 psi/ft, average .365
- Average depth mid- perf 737
- Calculated pressure = 269 psi

Initial Gas Formation Volume Factor

Gas Gravity

- Specific gravity - 0.62
- CO2 content – 6.46 %

Porosity Range

- 3 – 10% (A. Agrawal, 2010)

Average Porosity

- 9% (A. Agrawal, 2010)

Gas Content

- Approximately 60 – 70% of Antrim gas is absorbed to the rock matrix (A. Agrawal, 2010).
- Gas content for the Antrim ranges between 40 SCF/ton to 100 SCF/ton (Phasis Consulting, 2008)
- 80 acre unit = 26,840,051 tons of rock or 1,073.602 to 2,684.005 MMcf
- The Chess Play Unit is 3,860 acres or 1,295,032,461 tons of rock = 51,801 – 129,503 MMcf in place

Exhibit I – Estimated In-Place Volumes & Recoveries

Chestonia 18 Unit

Estimated In-Place Volumes & Recoveries

Original Gas in Place (OGIP) Estimate:

- 51,801 – 129,503 MMcf in place

Recoveries from Primary Production:

- Produced thru July 2019 - 8,372.96 MMcf
- Estimated Remaining Primary - 3,143.63 MMcf
- Total - 11,544.16 MMcf

Estimates Ultimate Recover (EGR) from CO2 EGR:

- Assuming 60% of original gas in place is absorbed to the rock 31,080 – 77,701 MMcf
- Assuming an additional 10% recovery of absorbed gas could be achieved by CO2 injection/absorption
- Potential additional gas recovered 3,108 MMcf to 7,770 MMcf

Total Potential EUR of Gas (Primary + CO2 EGR):

14,652 MMcf to 19,314 MMcf

Exhibit J – Estimated Economics of EGR Project

Chestonia 18 Unit

Estimated Economics of EGR Project

| Undiscounted Economics | <u>MM\$</u> |
|--|-----------------|
| Gross Revenue = 3,108,000 (lower end EGR) X \$2.25/mcf | \$ 6.993 |
| Estimated CAPEX = | \$ 0.600 |
| <u>EGR Operating LOE = \$12,000/year * 20 years</u> | <u>\$ 0.240</u> |
| Total | \$ 6.153 |

Exhibit K – Leasehold Report

All leases are leased to Riverside Energy Michigan or one of its processor companies.

CHESTONIA 18 LEASEHOLD REPORT

| LEASE NO. | LIBERPAGE | LESSOR | Street Address | Address | City, State, Zip | LEASE DATE | UNIT RATIFIED | TWP | RNG | SEC | LESSEE |
|-------------|-----------|------------------------------------|--|-----------------------|--------------------------|------------|---------------|-----|-----|-----|-----------------------------|
| MI009014501 | 397 | 1213 BURNETT, DARWON A. ET AL | P.O. Box 988 | | Bellaire, MI 49615-0988 | 08/01/93 | YES | 30N | 6W | 5 | CAP LAND COMPANY |
| | | | | | | | | 30N | 6W | 6 | |
| | | | | | | | | 30N | 6W | 7 | |
| | | | | | | | | 30N | 6W | 8 | |
| | | | | | | | | 30N | 7W | 11 | |
| | | | | | | | | 30N | 7W | 12 | |
| | | | | | | | | 30N | 6W | 18 | |
| | | | | | | | | 30N | 6W | 17 | |
| MI009014800 | 397 | 231 KAFI, ALI & PARVIN L. | Pole Star, LLC (new owner) | P.O. Box 172 | Eastport, MI 49627 | 09/01/93 | YES | 30N | 7W | 1 | CAP LAND COMPANY |
| | | | | | | | | 30N | 7W | 12 | |
| MI009018100 | 402 | 1407 KUNZ, RAYMOND E. & NINA | 319 N Rembrandt Ave | | Royal Oak, MI 48067-2011 | 10/13/93 | YES | 30N | 6W | 18 | NORTHERN LAKES PETROLEUM |
| MI009019101 | 403 | 399 AGRIBANK #13427 | P.O. Box 64949 | | St. Paul, MN 55164-0949 | 11/11/93 | YES | 30N | 7W | 11 | NORTHERN LAKES PETROLEUM |
| MI009021000 | 400 | 226 MOORE, JESSE P. & RUTH E. | Timothy L & Joan E Moore (New owner) | 1466 Doerr Road | Mancelona, MI 49659-9310 | 09/09/93 | YES | 30N | 7W | 11 | NORTHERN LAKES PETROLEUM |
| MI009023400 | 404 | 1416 PORTER MINERAL RIGHT TRUST | Old Kent Bank & Trust Company, Trustee | One Vandenberg Square | Grand Rapids, MI 49503 | 12/18/93 | YES | 30N | 6W | 17 | CAP LAND COMPANY |
| | | | | | | | | 30N | 6W | 18 | |
| | | | | | | | | 30N | 6W | 8 | |
| MI009030601 | 400 | 234 KOTZ, ROLLAND, ETAL | 1891 Montgomery Road | | Bellaire, MI 49615-9784 | 09/08/93 | YES | 30N | 7W | 11 | NORTHERN LAKES PETROLEUM |
| MI009031201 | 408 | 1174 AUSTIN, WILLIAM T. & DORIS M. | 7405 Austin Road | | Bellaire, MI 49615-9470 | 02/25/94 | YES | 30N | 6W | 18 | NORTHERN LAKES PETROLEUM |
| MI009062601 | 417 | 1265 SCAGGS, JAMES & DOROTHY | Laraine Anderson (new owner) | 1891 Montgomery Road | Bellaire, MI 49615-9784 | 08/10/94 | YES | 30N | 7W | 11 | NORTHERN LAKES PETROLEUM |
| MI009103900 | 359 | 1372 PORTER MINERAL RIGHT TRUST | Old Kent Bank & Trust Company, Trustee | One Vandenberg Square | Grand Rapids, MI 49503 | 03/01/91 | YES | 30N | 7W | 11 | RONALD L WILLMES |
| | | | | | | | | 30N | 7W | 1 | |
| MI009268400 | 767 | 1727 STATE OF MICHIGAN N-42213 | P.O. Box 30448 | | Lansing, MI 48909-7948 | 03/20/07 | YES | 30N | 7W | 11 | DTE GAS & OIL COMPANY |
| MI009268500 | 767 | 1738 STATE OF MICHIGAN N-42214 | P.O. Box 30448 | | Lansing, MI 48909-7948 | 03/20/07 | YES | 30N | 7W | 11 | DTE GAS & OIL COMPANY |
| MI009284600 | 784 | 232 STATE OF MICHIGAN N-44439 | P.O. Box 30448 | | Lansing, MI 48909-7948 | 07/14/08 | YES | 30N | 7W | 1 | ALTAS GAS & OIL COMPANY LLC |

The tax assessed owners, as per the Antrim County Treasurer's Office, within the proposed Unit Area.

| Name #1 | Name #2 | Address | City/State/Zip | Tax ID # | Town/Range | Section | Brief Legal |
|---------------------------------|----------------------------|---------------------------------|------------------------------|------------------|------------|---------|---------------------------------|
| Darwon A. Burnett & Yvonne J. | Walter E. Burnett | P.O. Box 572 | Mancelona, MI 49659 | 05-03-005-006-00 | T30N, R6W | 5 | SW/4SW/4 |
| Darwon A. Burnett & Yvonne J. | Walter E. Burnett | P.O. Box 572 | Mancelona, MI 49659 | 05-03-006-007-00 | T30N, R6W | 6 | SE/4 |
| Walter E. Burnett & Joann L. Bu | Burnett-Grantham-Holcomb | 9484 W. Hill Road | Swartz Creek, MI 48473 | 05-03-006-007-10 | T30N, R6W | 6 | SW/4 |
| Darwon A. Burnett & Yvonne J. | Walter E. Burnett | P.O. Box 572 | Mancelona, MI 49659 | 05-03-007-001-00 | T30N, R6W | 7 | Pt E/2 |
| Walter E. Burnett & Joann L. Bu | Burnett-Grantham-Holcomb | 9484 W. Hill Road | Swartz Creek, MI 48473 | 05-03-007-001-10 | T30N, R6W | 7 | W/2 |
| Yvonne J. Burnett | | P.O. Box 572 | Mancelona, MI 49659 | 05-03-007-001-20 | T30N, R6W | 7 | N/2 N/2 NE/4 NE/4 |
| State of Michigan | | P.O. Box 30448 | Lansing, MI 48909 | 05-03-008-002-00 | T30N, R6W | 8 | Pt NE/4 NW/4 & Pt NW/4 NE/4 |
| Michigan Dept. of Treasury | Finance & Acct Div - PILT | P.O. Box 30722 | Lansing, MI 48909 | 05-03-008-003-00 | T30N, R6W | 8 | Pt NE/4 NW/4 & Pt NW/4 NE/4 |
| Anthony J. Deschutter | Renee H. Deschutter | 20018 Meier Road | St. Clair Shores, MI 48081 | 05-03-008-004-00 | T30N, R6W | 8 | Pt NE/4 NW/4 & Pt NW/4 NE/4 |
| Anthony J. Deschutter | Renee H. Deschutter | 20018 Meier Road | St. Clair Shores, MI 48081 | 05-03-008-005-00 | T30N, R6W | 8 | E/2 SE/4 NW/4 & SW/4 NE/4 |
| James W. Lucka | Diane M. Lucka | 4931 W. Lucka Drive | Weidman, MI 48893 | 05-03-008-006-00 | T30N, R6W | 8 | W/2 SE/4 NW/4 E of Hwy |
| Darwon A. Burnett & Yvonne J. | Walter E. Burnett | P.O. Box 572 | Mancelona, MI 49659 | 05-03-008-007-00 | T30N, R6W | 8 | Pt W/2 W of Hwy M-66 |
| Rodney Kippe | Kelli Kippe | 1282 S. M-66 Hwy | Mancelona, MI 49659 | 05-03-008-007-10 | T30N, R6W | 8 | Pt NW/4 |
| John J. Cuca | | 5555 Bonar Drive | Charlevoix, MI 49720 | 05-03-008-008-00 | T30N, R6W | 8 | NW/4 SE/4 |
| Stephen & Eric & Melissa Hall | Gerald & Beverley Hallberg | 1867 S. M-66 Hwy. | Mancelona, MI 49659 | 05-03-008-009-00 | T30N, R6W | 8 | Pt SE/4 SW/4 E of Hwy |
| Bert L. Geren | | P.O. Box 837 | East Jordan, MI 49727 | 05-03-008-009-10 | T30N, R6W | 8 | S/2 SW/4 SE/4 |
| Daniel Mick | | 309 Maple Street | Bellaire, MI 49615 | 05-03-008-009-21 | T30N, R6W | 8 | Pt N/2 SW/4 SE/4 |
| Bert L. Geren | | P.O. Box 837 | East Jordan, MI 49727 | 05-03-008-009-30 | T30N, R6W | 8 | Pt N/2 SW/4 SE/4 |
| Margaret A. Landy | | 6650 Birch Lake Road | Kewadin, MI 49648 | 05-03-008-010-00 | T30N, R6W | 8 | Pt SE/4 SW/4 |
| Anthony J. Deschutter | Renee H. Deschutter | 20018 Meier Road | St. Clair Shores, MI 48081 | 05-03-008-011-00 | T30N, R6W | 8 | NE/4 SW/4 |
| Anthony J. Deschutter | Renee H. Deschutter | 20018 Meier Road | St. Clair Shores, MI 48081 | 05-03-008-011-00 | T30N, R6W | 8 | NE/4 SW/4 |
| Darwon A. Burnett & Yvonne J. | Walter E. Burnett | P.O. Box 572 | Mancelona, MI 49659 | 05-03-017-001-00 | T30N, R6W | 17 | Pt NW/4 |
| Patric Gates Construction LLC | | 242 N. Mayer Road | Smiths Creek, MI 48074 | 05-03-017-001-10 | T30N, R6W | 17 | Pt NW/4 |
| Darwon A. Burnett | | P.O. Box 572 | Mancelona, MI 49659 | 05-03-017-001-20 | T30N, R6W | 17 | Pt NW/4 |
| January Rental Co. Inc. | | 954 Park Drive #5 | Traverse City, MI 49685-2027 | 05-03-017-001-30 | T30N, R6W | 17 | Pt NW/4 |
| Riverside Energy Michigan LLC | | 10691 E. Carter Road, Suite 201 | Traverse City, MI 49684 | 05-03-017-001-35 | T30N, R6W | 17 | Pt NW/4 |
| Edward C. Davidson | | 2033 S. M-66 Hwy | Mancelona, MI 49659 | 05-03-017-002-00 | T30N, R6W | 17 | Pt NW/4 NE/4 |
| Samantha Kelly | | 886 N. Meadow Drive | Gaylord, MI 49735 | 05-03-017-003-00 | T30N, R6W | 17 | Pt NW/4 |
| Janice Estes | | 21124 Maybury Park | Novi, MI 48167 | 05-03-017-004-00 | T30N, R6W | 17 | Pt NE/4 & Pt NW/4 NE/4 E of Hwy |
| Larry Estes | Janice Estes | 21124 Maybury Park Drive | Novi, MI 48167 | 05-03-017-004-10 | T30N, R6W | 17 | Pt NW/4 E of Hwy & Pt N1/2 E/2 |
| Darwon A. Burnett & Yvonne J. | Walter E. Burnett | P.O. Box 572 | Mancelona, MI 49659 | 05-03-018-001-00 | T30N, R6W | 18 | N/2 NE/4 |
| Walter E. Burnett & Joann L. Bu | Burnett-Grantham-Holcomb | 9484 W. Hill Road | Swartz Creek, MI 48473 | 05-03-018-002-00 | T30N, R6W | 18 | NE/4 NW/4 |
| Raymond E. Kunz | Nina Kunz | 319 Rembrandt | Royal Oak, MI 48067 | 05-03-018-003-00 | T30N, R6W | 18 | S/2 N/2 & NW/4 NW/4 |
| Pole Star LLC | | P.O. Box 712 | Eastport, MI 49627 | 05-10-001-001-00 | T30N, R7W | 1 | S/2 & Pt S/2 S/2 N/2 |
| Michigan Dept. of Treasury | Finance & Acct Div - PILT | P.O. Box 30722 | Lansing, MI 48909 | 05-10-001-002-00 | T30N, R7W | 1 | W/2 NW/4 N&W of RR ROW |
| DNRE | | P.O. Box 30028 | Lansing, MI 48909-8235 | 05-10-001-003-00 | T30N, R7W | 1 | Pt NE/4 NW/4 |
| DNRE | | P.O. Box 30028 | Lansing, MI 48909-8235 | 05-10-001-004-00 | T30N, R7W | 1 | Pt N3/4 N/2 & Pt S/2 S/2 N/2 |
| Walter E. Burnett & Joann L. Bu | Burnett-Grantham-Holcomb | P.O. Box 988 | Bellaire, MI 49615 | 05-10-011-001-00 | T30N, R7W | 11 | E/2 SE/4 |
| DNRE | | P.O. Box 30028 | Lansing, MI 48909-8235 | 05-10-011-001-10 | T30N, R7W | 11 | N/2 NW/4 E of RR & NE/4 |
| Scott D. Duncan | S. Lynne Duncan | 11663 E. 900 N. | Kendallville, IN 46755 | 05-10-011-002-00 | T30N, R7W | 11 | N/2 NW/4 W of RR ROW |
| State of Michigan | | P.O. Box 30448 | Lansing, MI 48909-7948 | 05-10-011-003-00 | T30N, R7W | 11 | Pt S/2 NW/4 |
| State of Michigan | | P.O. Box 30448 | Lansing, MI 48909-7948 | 05-10-011-004-00 | T30N, R7W | 11 | Pt S/2 NW/4 |
| Rolland E. Kotz | | 1891 Montgomery Road | Bellaire, MI 49615 | 05-10-011-007-00 | T30N, R7W | 11 | Pt E/2 SW/4 |
| Rolland E. Kotz | | 1891 Montgomery Road | Bellaire, MI 49615 | 05-10-011-007-10 | T30N, R7W | 11 | Pt SE/4 SW/4 |
| Steven Bacon Jr. | | 7620 Thomas | Central Lake, MI 49622 | 05-10-011-007-20 | T30N, R7W | 11 | Pt SE/4 SW/4 |
| Timothy L. Moore | Joan E. Moore | 1602 Bush Road | Bellaire, MI 49615 | 05-10-011-008-01 | T30N, R7W | 11 | W/2 SE/4 |
| State of Michigan | | P.O. Box 30448 | Lansing, MI 48909-7948 | 05-10-011-009-00 | T30N, R7W | 11 | Former RR across NW/4 NW/4 |
| Walter E. Burnett & Joann L. Bu | Burnett-Grantham-Holcomb | P.O. Box 988 | Bellaire, MI 49615 | 05-10-012-001-00 | T30N, R7W | 12 | Pt S/2 |
| Pole Star LLC | | P.O. Box 712 | Eastport, MI 49627 | 05-10-012-001-10 | T30N, R7W | 12 | N/2 |
| Walter E. Burnett & Joann L. Bu | Burnett-Grantham-Holcomb | 9484 W. Hill Road | Swartz Creek, MI 48473 | 05-10-012-001-20 | T30N, R7W | 12 | Pt SW/4 SW/4 |

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Agrawal, A. (2010). A Technical and Economic Study of Completion Techniques in Five Emerging US Gas Shales. College Station, Texas, United States of America: Texas A&M University.

Phasis Consulting, .: (2008, September). US Shale Gas Brief. United States of America: Phasis Consulting. Retrieved June 24, 2013, from www.phasis.ca

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APPENDIX

Single Well (average representative)

Bulk Rock Mass

| | | |
|--------------------------|--------------------|------------------------------|
| Area | 80 | acres |
| | 43,560 | ft ² /acre |
| Net Pay | 105 | ft |
| Bulk volume | 365,904,000 | ft ³ |
| | 10,361,230,387,200 | cm ³ |
| Bulk mass | 2.35 | g/cm ³ shale s.g. |
| | 24,348,891,409,920 | g |
| | 26,840,051 | tons |
| 40 SCF/ton per 80 acres | 1,073,602,028.69 | Scf/80 acres |
| 100 SCF/ton per 80 acres | 2,684,005,072 | Scf/80 acres |