

**Manitoba**



**Mineral Resources**

**Petroleum Branch**

360-1395 Ellice Ave , Winnipeg, Manitoba, Canada R3G 3P2

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www.manitoba.ca

May 7, 2014

Jennifer Perry, P. Eng.  
Legacy Oil + Gas Inc.  
4400, 525 8<sup>th</sup> Avenue SW  
Calgary, Alberta  
T2P 1G1

Dear Jennifer,

**RE: North Pierson Unit No. 2 – Waterflood Order & Third Tier EOR Factor**

With reference to our letter to you dated March 27, 2014, please find attached Waterflood Order No.33 which applies to the unit. Legacy is reminded that separate conversion applications are required for any existing horizontals to be converted to waterflood within this new Unit.

The waterflood order requires Legacy to conduct annual pressure surveys and submit an annual progress report. Legacy is reminded that the 2014 report is to be submitted to the Director within 60 days after the end of the calendar year.

North Pierson Unit No. 2 will qualify for a Third Tier EOR Factor (TTEF). The Branch has calculated a proposed TTEF of 0.8994 to apply to all tracts in the unit. Table 1 shows the TTEF calculation. The TTEF is based on summed estimates of remaining primary recoverable reserves and incremental waterflood recoverable reserves for unit. Please provide the Branch with any comments on the proposed TTEF by June 7, 2014.

If you have any questions in respect of the approvals or the TTEF calculations please contact Leo Leonen at (204) 945-6570.

Yours truly,

A handwritten signature in black ink, appearing to read "Dan Surzyshyn", written over the words "Yours truly,".

Dan Surzyshyn  
A/Director

**Manitoba**  
spirited energy

Cc: Administration, Winnipeg  
Petroleum Branch, Waskada

**Table 1. Third Tier EOR Factor Calculation**

Legacy Oil + Gas North Pierson Unit #2	
Unit	North Pierson Unit No. 2
Operator Sections	Legacy Oil + Gas 1/2
Effective Date of Third EOR Production	June 1, 2014
Cumulative Unit Production to October 31, 2013 (m <sup>3</sup> )	14,000.0
Primary Recoverable Reserves (m <sup>3</sup> )	26,650.0
Incremental EOR Rec. Reserves (IERR) (m <sup>3</sup> )	113,100.0
Total Remaining Rec. Reserves (TRES) (m <sup>3</sup> )	125,750.0
Third Tier EOR Factor (TTEF)	0.8994



**MINISTER OF  
MINERAL RESOURCES**

Legislative Building  
Winnipeg, Manitoba CANADA  
R3C 0V8

**MINISTERIAL ORDER**

**Subsection 116(2)  
THE OIL AND GAS ACT**

**WATERFLOOD ORDER NO. 33**

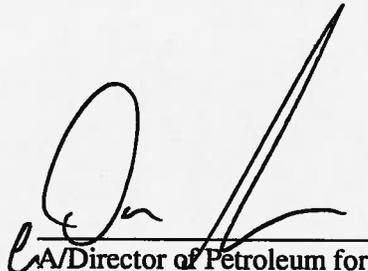
**Pertaining to Waterflood Operations  
in North Pierson Unit No. 2**

- 1.0 The Unit Operator shall conduct waterflood operations by injecting water into the Pierson Lower Amaranth Pool underlying North Pierson No. 2 ("the Unit") through the wells listed in Schedule A. The Director may approve the conversion of additional wells in the Unit to water injection.
- 1.1 Every injection well shall be completed as approved under Section 47 of the Drilling and Production Regulation ("the Regulation").
- 1.2 The maximum wellhead pressure at which water may be injected is 4700 kPa.
- 1.3 The Director may, from time to time, establish a maximum or minimum rate at which water may be injected into a well.
- 1.4 The annulus of each injection well shall be pressure tested in accordance with Section 50 of the Regulation.
- 2.0 The Unit Operator shall conduct an annual survey to determine the level and distribution of reservoir pressure in the Unit. A summary of the results of any pressure surveys conducted during the year are to be included in the annual waterflood progress report required under Section 73 of the Regulation.
- 2.1 The frequency of pressure surveys may be reduced where the Director is satisfied that more frequent surveys will not assist the Unit Operator in monitoring the effectiveness of the waterflood.
- 2.2 The Unit Operator is responsible for monitoring the effectiveness of the waterflood and for collecting such reservoir data and other information as is necessary to evaluate and optimize waterflood performance.

- 2.3 The Unit Operator shall advise the Petroleum Branch of the suspension of water injection at any well, any indication of channelling or breakthrough of injected water to a producing well or out of zone and any other detrimental effects that may be attributable to the waterflood operations.
- 3.0 The Unit Operator shall file a report of production or injection for each well in the Unit in accordance with Section 120 of the Regulation.
- 4.0 The Unit Operator shall file an annual waterflood progress report in accordance with Section 73 of the Regulation.
- 5.0 Only Lower Amaranth formation water has been approved to be injected into the Unit. Any other source of water must be approved by the Petroleum Branch prior to injection.

MAY 7, 2014

Date



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A/Director of Petroleum for  
Minister Mineral Resources

**SCHEDULE A**

**WATERFLOOD ORDER NO. 33**

**NORTH PIERSON UNIT NO. 2**

**WATER INJECTION WELL(S)**

<b>WELL NAME</b>	<b>LSD</b>	<b>SEC</b>	<b>TWP</b>	<b>RGE</b>
North Pierson Unit No. 2 WIW HZNTL	01	08	02	28