

Manitoba



Mineral Resources

Petroleum Branch

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May 1, 2015

Glenn Ross

Tundra Oil & Gas Partnership

1700 – One Lombard Place

Winnipeg, MB R3B 0X3

Dear Glenn,

RE: Birdtail Unit No. 3 – WF Order & Third Tier EOR Factor

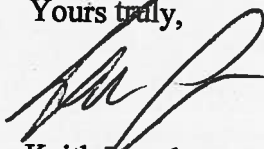
With reference to our letter dated January 9, 2014, please find attached Waterflood Order No.45 which applies to the unit. Tundra is reminded that separate conversion applications are required for any existing horizontals to be converted to injectors within this unit.

The Waterflood order requires Tundra to conduct annual pressure surveys and submit an annual progress report. Tundra is reminded that the 2015 report is to be submitted to the Director within 60 days after the end of the calendar year.

Birdtail Unit No. 3 will qualify for a Third Tier EOR Factor (TTEF). The Branch has calculated a proposed TTEF of 0.6317 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 EOR recoverable reserves for unit. Please provide the Branch with any comments on the proposed TTEF by June 1, 2015.

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

Yours truly,



Keith Lowdon
Director

Manitoba
spirited energy

Cc: Administration, Winnipeg
Virden Office

Table 1. Third Tier EOR Factor Calculation

Birdtail Unit #3	
Unit	Birdtail Unit No. 3
Operator	Tundra Oil & Gas
Sections	2 1/2
Effective Date of Third EOR Production	May 1, 2015
Cumulative Unit Production to June 30, 2014 (m ³)	70,200.0
Primary Recoverable Reserves (m ³)	168,399.0
Incremental EOR Rec. Reserves (IERR) (m ³)	168,399.0
Total Remaining Rec. Reserves (TRES) (m ³)	266,598.0
Third Tier EOR Factor (TTEF)	0.6317



**MINISTER OF
MINERAL RESOURCES**

Legislative Building
Winnipeg, Manitoba CANADA
R3C 0V8

MINISTERIAL ORDER

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

WATERFLOOD ORDER NO. 45


**Pertaining to Waterflood Operations
in Birdtail Unit No. 3**

- 1.0 The Unit Operator shall conduct waterflood operations by injecting water into the Birdtail Middle Bakken - Three Forks Pool underlying Birdtail Unit No. 3 ("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 4 200 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 Lodgepole formation and Bakken-Three Forks formation source waters are approved to be injected into the Unit. Any other source of water must be approved by the Petroleum Branch prior to injection.

May 1, 2015
Date


Director of Petroleum for
Minister Mineral Resources

PETROLEUM DOCUMENT REGISTRY	
Document No.	<u>18-4173</u>
Registered	<u>May 5, 2015</u>
 Petroleum Registrar	

SCHEDULE A

WATERFLOOD ORDER NO. 45

BIRDTAIL UNIT NO. 3

WATER INJECTION WELLS

WELL NAME	LSD	SEC	TWP	RGE
Birdtail Unit No. 3 HZNTL WIW	7	30	16	27
Birdtail Unit No. 3 HZNTL WIW	11	30	16	27