

June 17, 2020

2000-4535-59240-09

Brendan Cathery, P.Eng
Exploitation Engineer
Whitecap Resources Inc.
3800, 525 – 8th Ave S.W.
Calgary, AB T2P 1G1

Dear Mr. Cathery:

**RE: PRESSURE MAINTENANCE WATERFLOOD SPECIAL PROJECT – AMENDMENT #7
OTHER THAN NORMAL SPACING ORDER – AMENDMENT #7
BOUNDARY LAKE FIELD – BOUNDARY LAKE “A” POOL - UNIT #2**

The Commission is presently reviewing and amending waterflood approvals to conform to current requirements. The continued operation of a pressure maintenance waterflood in the Boundary Lake field – Boundary Lake “A” pool Unit #2 by Whitecap Resources Inc. requires this review.

The Boundary Lake - Boundary Lake ‘A’ pool Unit #2 oil pool commenced production in February 1955. A pressure maintenance waterflood project was approved in August 1964, with injection starting in May 1965. The pool currently has 67 producers and 21 injectors. A review of reservoir performance indicates that the waterflood was successful in stabilizing the GOR, achieving a cumulative oil recovery of approximately 42.5%.

The following Orders are attached;

- 1) Order 64-09-006 Amendment #7 designating Pressure Maintenance Waterflood within the Boundary Lake field – Boundary Lake “A” pool, as a Special Project under section 75 of the *Oil and Gas Activities Act*, and
- 2) Order 64-09-006 Amendment #7 - OTN approving Other Than Normal Spacing under section 65.1 of the *Petroleum and Natural Gas Act* for the subject area and formation.

It is noted that five of the six wells that had a pressure test taken in 2019 showed a pressure which exceeded the initial reservoir pressure. As a reminder, injection pressures and volumes must be controlled to limit areas of high reservoir pressure in the Boundary Lake ‘A’ pool Unit #2 such that the pool does not exceed the initial reservoir pressure at the end of operations. Failure to meet conditions of the approval order may result in its cancellation or suspension.

Please note that, as per section 75 of the *Drilling and Production Regulation*, a record of the volume of water injected and the MWHIP must be reported via Petrinex not later than 20th day of the month following the reported month.

Should you have any questions, please contact Petra Kriescher-Trudgeon at (250) 419-4415 or the undersigned at (250) 419-4430.

Sincerely,

A handwritten signature in blue ink, appearing to read "R Stefik", is positioned above a horizontal line. The signature is written in a cursive style.

Ron Stefik, Eng.L.
Supervisor, Reservoir Engineering
Oil and Gas Commission

Attachments



ORDER 64-09-006 Amendment #7

- 1 Under section 75(1)(a) of the *Oil and Gas Activities Act*, the Boundary Lake field – Boundary Lake “A” pool Unit #2 is designated as a Special Project for the recovery of oil utilizing pressure maintenance waterflood within the following area;

Twp 85 Rge 13 W6M	N/2 Section 18, Sections 19, 30, 31, NW/4 Section 20, W/2 Section 29
Twp 85 Rge 14 W6M	N/2 Sections 13, 21, 22, Sections 23-25, 27, 28, 36, S/2 Sections 33, 34
Twp 86 Rge 13 W6M	NW/4 Section 5, Sections 6, 7, 18, 19, W/2 Sections 8, 17, S/2 Section 30
Twp 86 Rge 14 W6M	Sections 1, 12, 13, 24, SE/4 Section 25.
- 2 Under section 75(2) of the *Oil and Gas Activities Act*, I specify the following:
 - a) The project unadjusted daily oil allowable (UDOAA) is 3,610.9 m³/d.
 - b) All associated produced gas must be conserved.
 - c) Water may be injected into the wells listed in Appendix ‘A’.
 - i. For wells injecting other than fresh water, inject only through tubing with a packer set as near as is practical above the injection interval.
 - ii. Not exceed an injection pressure, measured at the wellhead of 14,300 kPa or the pressure required to fracture the formation, whichever is lesser.
 - d) Not exceed an average pool pressure of 12,505 kPa_a measured at 533 meters subsea.
 - e) Cease injection into a well listed in (c) and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
 - f) Submit the annual packer isolation test report for wells listed in (c) to the Commission within 30 days of the completion of the test.
 - g) Include the monthly injected volume, injection hours and the maximum injection pressure value for the well listed in (c) via Petrinex.
 - h) Injection must cease upon termination of production from the pool.
 - i) Annual pool VRR must not exceed 1.0

Advisory Guidance for Order 64-09-006 Amendment #7

- I. A production packer must be set above the injection interval and the space between the tubing and casing filled with corrosion and frost inhibiting fluids, as per section 16(2) of the Drilling and Production Regulation.
- II. Annual packer isolation tests are required to be submitted, as per section 16(3) of the Drilling and Production Regulation.
- III. Injected fluids must be metered and the injection pressure measured at the wellhead, as per section 74 of the Drilling and Production Regulation.
- IV. A monthly disposal statement must be submitted to the Commission via Petrinex not later than the 20th day of the month following the reported month, as per section 75 of the Drilling and Production Regulation.
- V. Seismic events must be reported and injection operations suspended as per section 21.1 of the Drilling and Production Regulation.



Ron Stefik, Eng.L.
Supervisor, Reservoir Engineering
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 17th day of June 2020.

Appendix A: Approved Boundary Lake – Boundary Lake ‘A’ pool Unit #2 Water Injectors – proj 03

WA	Well Name	UWI
206	Whitecap et al Boundary 16-36-085-14	16-36-085-14
218	Whitecap et al Boundary Lake 16-31-085-13	16-31-085-13
580	Whitecap et al Boundary 16-13-085-14	16-13-085-14
593	Whitecap et al Boundary 16-12-086-14	16-12-086-14
628	Whitecap et al Boundary 16-18-085-13	16-18-085-13
636	Whitecap et al Boundary 16-19-085-13	16-19-085-13
652	Whitecap et al Boundary 08-23-085-14	08-23-085-14
719	Whitecap et al Boundary 16-23-085-14	16-23-085-14
736	Whitecap et al Boundary 16-24-085-14	16-24-085-14
812	Whitecap et al Boundary 16-27-085-14	16-27-085-14
823	Whitecap et al Boundary 16-22-085-14	16-22-085-14
844	Whitecap et al Boundary 16-07-086-13	16-07-086-13
858	Whitecap et al Boundary 16-13-086-14	16-13-086-14
860	Whitecap et al Boundary 16-01-086-14	16-01-086-14
1009	Whitecap et al Boundary 16-06-086-13	16-06-086-13
1029	Whitecap et al Boundary 16-24-086-14	16-24-086-14
1144	Whitecap et al Boundary 16-25-085-14	16-25-085-14
1481	Whitecap et al Boundary 16-30-085-13	16-30-085-13
1543	Whitecap et al Boundary 16-28-085-14	16-28-085-14
1798	Whitecap et al Boundary 16-21-085-14	16-21-085-14
8086	Whitecap et al Boundary 12-13-085-14	12-13-085-14

ORDER 64-09-006 Amendment #7 - OTN

- 1 Under Section 65.1(2) of the *Petroleum and Natural Gas Act*, Other Than Normal Spacing is approved within the Boundary Lake field – Boundary Lake “A” Unit #2 pool within the following area;

Twp 85 Rge 13 W6M	N/2 Section 18, Sections 19, 30, 31, NW/4 Section 20, W/2 Section 29
Twp 85 Rge 14 W6M	N/2 Sections 13, 21, 22, Sections 23-25, 27, 28, 36, S/2 Sections 33, 34
Twp 86 Rge 13 W6M	NW/4 Section 5, Sections 6, 7, 18, 19, W/2 Sections 8, 17, S/2 Section 30
Twp 86 Rge 14 W6M	Sections 1, 12, 13, 24, SE/4 Section 25.

- 2 Under section 65.1(3) of the *Petroleum and Natural Gas Act*, I specify the following:
 - a) the target area for an oil well completed within the project area is not nearer than 100 m to the sides of the Other Than Normal Spacing area,
 - b) an oil well completed outside the target area specified in paragraph (a) may be subject to an off-target production penalty,
 - c) oil wells drilled within the specified project area are not subject to spacing requirements.



Ron Stefik, Eng.L.
Supervisor, Reservoir Engineering
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 17th day of June 2020.