



February 4, 2019

1880-6200-32640-02

Floyd Siegle
Vice President Engineering
Primavera Resources Corp.
Suite 2700 Bow Valley Square II
255 – 5th Avenue S.W.
Calgary, AB T2P 3G6

Dear Mr. Siegle,

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL, AMENDMENT #1
PRIMAVERA RES BOUDREAU 15-13-84-21; WA# 11309
BOUDREAU FIELD – BELLOY FORMATION**

Commission staff have reviewed the request from Primavera Resources Corp. to increase the allowed maximum wellhead injection pressure (MWHIP) for the subject well. Approval for disposal into this well was granted December 20th, 2018.

A review has been conducted to ensure a higher MWHIP at this well is prudent. Hydraulic fracture information for the nearby Belloy B well, 6-13-84-21, indicating a breakdown pressure of 46 MPa surface or 54 MPa sandface indicates a fracture gradient of 25.4 kPa/m. This proximal Belloy frac data confirms the formation can withstand an increase to the higher pressure MWHIP.

Attached please find **Order 18-02-010 Amendment #1**, designating an area in the Boudreau field, Belloy formation, as a Special Project under section 75 of the Oil and Gas Activities Act. Additional general information regarding disposal wells is available on the Commission's website at <http://www.bcogc.ca/industry-zone/documentation/Subsurface-Disposal>.

For the inspection requirement of Order condition 2(m), please arrange via email to OGCPipelines.Facilities@bcogc.ca.

Should you have any questions, please contact Michelle Gaucher at (250) 419-4482 or Ron Stefik at (250) 419-4430.

Sincerely,

A handwritten signature in black ink, appearing to read 'R Stefik', written over a horizontal line.

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

Attachment

ORDER 18-02-010 AMENDMENT #1

- 1 Under Section 75(1)(d) of the *Oil and Gas Activities Act*, the Commission designates the operation and use of a storage reservoir for the disposal of produced water, including flowback from fracturing operations, in the Boudreau field – Belloy formation as a special project in the following area:

DLS Twp 84 Rge 21 W6M Section 13 - Lsds 9, 10, 15 and 16

- 2 Under section 75(2) of the *Oil and Gas Activities Act*, the special project designation in this Order is subject to the following conditions. The Permit Holder shall:
- a) Inject produced water only into the well Primavera Res Boudreau 15-13-84-21; WA# 11309 – Belloy (perforations 2087.0 to 2125.0 mKB) formation.
 - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 17,700 kPag or the pressure required to fracture the formation, whichever is lesser.
 - c) Inject only through tubing with a packer set as near as is practical above the injection interval.
 - d) Continually measure and record the wellhead casing and tubing pressures electronically.
 - e) Cease injection and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
 - f) Submit the annual packer isolation test report to the Commission within 30 days of the completion of the test.
 - g) Include the disposal operating hours and the maximum injection pressure value on the monthly Petrinex disposal report.
 - h) Conduct an annual reservoir pressure test on the formation in the subject well, with a shut-in period of sufficient length to provide data for calculation of the reservoir pressure, and submit a report of the test within 60 days of the end of the test.
 - i) Cease injection upon reaching a maximum formation pressure of 21,400 kPaa, measured at 2094.3 mCF TVD.
 - j) i) Perform a casing inspection log on the subject well and submit results to the Commission within 30 days of the completion of logging, at an interval of not more than every 10 years, commencing from the date of initial disposal.
 - k) ii) Perform a hydraulic isolation temperature log on the subject well and submit results to the Commission within 30 days of the completion of logging, at an interval of not more than every 5 years, commencing from the date of initial disposal.
 - l) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.
 - m) Complete an inspection, satisfactory to the Commission, within 4 weeks of initial disposal operations.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 4th day of February, 2019.

Advisory Guidance for Order 18-02-010 AMENDMENT #1

- 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 disposal operations suspended as per section 21.1 of the Drilling and Production Regulation.