

April 6, 2020

1880-2885-32640-02

Floyd Siegle, P. Eng., MBA
VP Engineering
Primavera Resources Corp.
2700, 255 – 5th Ave S.W.
Calgary, AB T2P 3G6

Dear Floyd Siegle:

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT
PRIMAVERA RES BOUDREAU 15-13-84-21 (WA #11309)
BOUDREAU FIELD – CADOMIN-NIKANASSIN FORMATION**

The subject well was drilled and completed into the Belloy formation in 1998 and produced oil, gas, and water from June 1998 to July 2001. The well was subsequently used for disposal from December 2004 until July 2011 and was abandoned in August 2017. In October 2018, Primavera re-entered the well and re-perforated the Belloy. In December of 2018, the well was approved for disposal into the Belloy formation and injection occurred from September 2019 to January 2020. The Belloy zone was abandoned in January of 2020 and the Cadomin was perforated, injection tested for disposal, and then hydraulic fracture stimulated in February 2020.

Attached please find **Order 20-02-003**, designating an area in the Boudreau field – Cadomin-Nikanassin formation as a Special Project under section 75 of the *Oil and Gas Activities Act*, for the operation and use of a storage reservoir for the disposal of produced water. The Commission recognizes the Cadomin and Nikanassin formations as a compound, unsegregated zone in this area for disposal use. This Order includes a number of detailed operational conditions including: continuous tubing and casing pressure measurements, a maximum wellhead injection pressure, an ultimate reservoir pressure limit, as well as wellbore integrity monitoring and reporting requirements. Disposal wells are subject to regular field inspection and audit. Contravention of a condition of this Order may be subject to enforcement under section 62 of OGAA, or suspension or cancellation of the Order under section 75(2)(b).

Disposal of fluid with high total dissolved solids content requires adjustment of the wellhead injection pressure to remain below formation fracture pressure. It is the responsibility of the permit holder make adjustments to wellhead injection pressure.

In certain circumstances, disposal well operation may induce seismicity of values that require modification of operations to mitigate.

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

Should you have any questions, please contact Logan Gray at (250) 419-4465 or Ron Stefik at (250) 419-4430.

Sincerely,



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

Attachment

ORDER 20-02-003

- 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 – Cadomin-Nikanassin 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 water into the well Primavera Res Boudreau 15-13-84-21; WA# 11309 Cadomin-Nikanassin formation from 1142.0 – 1172.0 mKB MD.
 - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 13,725 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) Include the disposal operating hours and the maximum injection pressure value on the monthly Petrinex disposal report.
 - f) Cease injection and notify the Commission at Reservoir@bcogc.ca immediately if there are any indications that hydraulic isolation is lost in the wellbore or formation.
 - g) Conduct and submit an annual Surface Casing Vent Flow test to the Commission within 30 days of the completion of the test.
 - 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 11,425 kPaa, measured at 1157.0 mKB 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.
 - 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.
 - k) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.
 - l) 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 6th day of April 2020.

Advisory Guidance for Order 20-02-003

- 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 conducted and the associated report must be submitted to the Commission within 30 days of test completion, 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.