



October 13, 2017

8135-4100-32640-02

Graham Walker
Senior Development Engineer
Encana Services Company Ltd
500 Center St. S.E.
Calgary, AB T2P 2S5

Dear Mr. Walker,

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL
ECA CRP HZ SWAN C-B46-H/93-P-9; WA# 31959
SWAN LAKE FIELD – BALDONNEL FORMATION**

The Commission has received Encana's application, dated September 11th, 2017, for produced water disposal into the subject well, Baldonnel formation.

The subject horizontal well was purpose drilled for disposal; rig released October 10, 2016. The casing and cement integrity logging show good quality casing and cement that will provide hydraulic isolation of disposal fluids. This has been corroborated by temperature log showing no fluid storage outside of the Baldonnel.

Attached please find **Order 17-02-014**, designating an area in the Swan Lake field – Baldonnel 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. This Order contains a number of detailed operational conditions, including a maximum wellhead injection pressure, requirement for continuous tubing and casing pressure monitoring, and an ultimate reservoir pressure limit.

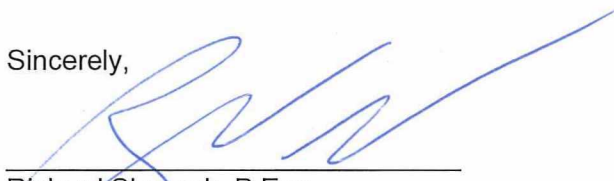
For the inspection requirement of Order condition 2m), please arrange via email to OGCPipelines.Facilities@bcogc.ca.

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

Disposal of fluid with high total dissolved solids content requires adjustment of the wellhead injection pressure to remain below formation fracture pressure.

Should you have any questions, please contact Michelle Gaucher at (250) 419-4493 or Ron Stefik at (250) 419-4430.

Sincerely,



Richard Slocomb, P.Eng.
Vice President, Engineering
Oil and Gas Commission

Attachment

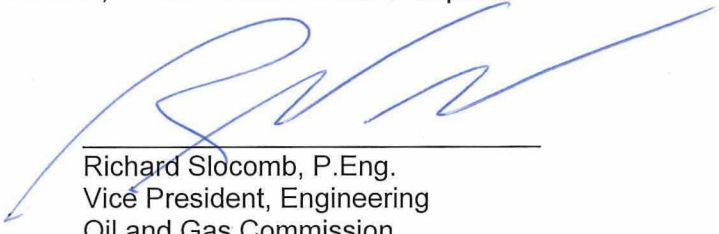


ORDER 17-02-014

- 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, into the Baldonnel formation – Swan Lake field as a special project in the following area:

NTS 93-P-09 Block H Unit 46

- 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:
- Inject produced water only into the well Eca Crp Hz Swan c-B046-H/093-P-09; WA# 31959 – Baldonnel formation (disposal interval 1846.0 – 1848.6 mKB).
 - Not exceed an injection pressure, measured at the wellhead on the subject well, of 9,300 kPag or the pressure required to fracture the formation, whichever is lesser.
 - Inject only through tubing with a packer set as near as is practical above the injection interval.
 - Continually measure and record the wellhead casing and tubing pressures electronically.
 - Cease injection and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
 - Submit the annual packer isolation test report to the Commission within 30 days of the completion of the test.
 - Conduct and submit an annual Surface Casing Vent Flow test to the Commission within 30 days of the completion of the test.
 - Include the disposal operating hours and the maximum injection pressure value on the monthly BC-S18 disposal statement.
 - 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.
 - Cease injection upon reaching a maximum formation pressure of 21,675 kPaa, measured at 1994.2 mKB TVD.
 - 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.
 - 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.
 - Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.
 - Complete an inspection, satisfactory to the Commission, within 4 weeks of initial disposal operations.


Richard Slocomb, P.Eng.
Vice President, Engineering
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 13th day of October, 2017.



Advisory Guidance for Order 17-02-014

- 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 not later than the 25th 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.