

July 4, 2018

8100-4580-32640-02

Tamara Glowa, P.Ag, EH&S Regulatory Advisor
Newalta Corporation
211 – 11 Avenue SW
Calgary, AB T2R 0C6

Dear Ms. Glowa,

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL
NEWALTA W STODDART 10-14-87-21 W6M; WA# 2777
STODDART WEST FIELD – NORTH PINE FORMATION**

Commission staff have reviewed the application from CG Engineering Ltd., on behalf of Newalta Corporation, dated February 20, 2018, for produced water disposal into the subject well, North Pine formation. Approval was previously granted on February 9th, 2018 for an extended injectivity test of 1,000 m³ under Order 18-02-003.

The subject well produced gas from the Belloy formation from April 1975 to February 1986, and was used for Halfway disposal from March 2003 until November 2012. In November 2012 it was discovered that the Halfway formation had surpassed formation fill-up pressure. Halfway pressures were monitored over a period of 3 years but the pressure did not decline below the fill-up pressure, and so the zone was abandoned. In November 2016 the North Pine formation was re-completed for disposal purpose. Application was made for North Pine disposal in December 2016, however a letter of non-consent from the tenure rights holder suspended the application review. In February 2018 Newalta re-submitted the application, having received consent from the tenure rights holder.

Attached please find **Order 18-02-003 Amendment #1**, designating an area in the Stoddart West field, North Pine 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 Advisory Guidance section of the Order includes references to Drilling and Production Regulation requirements that apply to disposal wells. Condition 2e) of the attached Order requires annual testing of the surface casing vent, in order to monitor the minor SCVF that was detected in June 2017. Based on geology review and injectivity test results, the North Pine zone has been shown to have poor injectivity and limited volume. Injectivity testing indicates that fill-up may be reached following the injection of an additional 26,000 m³ of fluid. Therefore, condition 2f)i) requires a reservoir pressure test to be performed following the injection of 15,000 m³ of fluid or after 12 months of disposal operation, whichever comes first. Following the review of reservoir pressure test results, the ongoing annual reservoir pressure testing requirement of condition 2f)ii) may be re-evaluated.

For the inspection requirement of Order 18-02-003 Amendment #1 condition 2j), 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 Harding at (250) 419-4493 or Ron Stefik at (250) 419-4430.

Sincerely,



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

Attachment

ORDER 18-02-003 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, into the North Pine formation – Stoddart West field as a special project in the following area:

DLS Twp 87 Rge 21 W6M Section 14 – 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 Newalta W Stoddart 10-14-87-21; WA# 2777 – North Pine formation (disposal perforations 1483.8 to 1486.5 mKB).
 - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 14,140 kPag or the pressure required to fracture the formation, whichever is lesser.
 - c) Continually measure and record the wellhead casing and tubing pressures electronically.
 - d) Cease injection immediately and notify the Commission if hydraulic isolation is lost in the wellbore or formation.
 - e) Conduct an annual Surface Casing Vent Flow test and submit to the Commission within 30 days of the completion of the test.
 - f) i) After injecting a cumulative volume of 15,000 m³ under this Order, or following 12 months of disposal operation, whichever comes first; conduct a 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. Thereafter;
ii) Conduct an annual reservoir pressure test on the formation in the subject well.
 - g) Cease injection upon reaching a maximum formation pressure of 15,140 kPaa, measured at 1485.2 mKB.
 - h) 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.
 - i) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.
 - j) Complete an inspection, satisfactory to the Commission, within 4 weeks of initial disposal operations under this Order.



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 July, 2018.

Advisory Guidance for Order 18-02-003 Amendment #1

- I. A production packer must be set as near as is practical 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, and failures repaired without unreasonable delay, 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, indicating the quantity of fluid injected, the maximum wellhead injection pressure and the total monthly operating hours, 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.