



August 30, 2017

2900-8400-32640-02

Nathan Bauder, LLB  
President & Chief Operating Officer  
Norcan Energy Corporation  
PO Box 858, Unit 6 - 4916 50th Avenue North  
Fort Nelson, BC V0C 1R0

Dear Mr. Bauder,

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL; AMENDMENT #1  
NORCAN CABIN a-49-G/94-P-05; WA# 2058  
CABIN FIELD – SLAVE POINT 'B' POOL**

Approval for disposal of produced water, Order 00-02-002, was issued for the subject well, Slave Point formation, on February 25, 2000. The Commission is presently amending disposal well approvals to conform to current requirements.

The subject well was initially completed in the Slave Point 'B' gas pool for production purpose, but never produced economically. In March 2000, WA 2058 was deepened and a production liner cemented to 2201.5 mKB, in order to dispose below the gas-water contact for the pool. Disposal into WA 2058 allowed continued production from the high water-cut pool until 2008.

In September 2015 Norcan was contacted by the Commission regarding a disposal review. In December 2015, Norcan indicated that the subject well would be shut-in for the foreseeable future. The Commission specified the testing that must be done prior to disposal re-start, including a reservoir pressure test, casing inspection log, cement bond log, temperature log, and installation of continuous wellhead pressure monitoring. However disposal re-started in December 2016 without the testing having been completed.


Attached please find **Order 00-02-002 Amendment #1**, designating an area in the Cabin field – Slave Point 'B' pool 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 deadline, agreed upon between the Commission and Norcan via email, prior to which the required testing must occur. In addition, a volume limit is set out in condition 2l) in order to ensure that the well does not operate outside of normal rates until assurance is provided of wellbore integrity. Based on the reported cumulative disposal to July 31, 2017, this is an incremental volume limit of 800 m<sup>3</sup>. Additional general information regarding disposal wells is available on the Commission's website at <http://www.bcogc.ca/industry-zone/documentation/Subsurface-Disposal>.

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 the undersigned at (250) 419-4430.

Sincerely,

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

Attachment



## ORDER 00-02-002 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 Slave Point 'B' pool – Cabin field as a special project in the following area:  
NTS 94-P-05 Block G Unit 49
- 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 Norcan Cabin a-49-G/94-P-05; WA# 2058 – Slave Point 'B' pool (open hole from 2201.5 – 2237.0 mKB).
  - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 4,810 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) i) Install electronic equipment to continually measure and record wellhead casing and tubing pressures by December 1, 2017, and from this date onwards;  
ii) 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 BC-S18 disposal statement.
  - h) Conduct a reservoir pressure test on the formation in the subject well by December 1, 2017, 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, conduct a reservoir pressure test once every two years
  - i) Cease injection upon reaching a maximum formation pressure of 22,050 kPaa, measured at 2219.3 mKB.
  - j) i) Perform a cement bond log by December 1, 2017, and submit results to the Commission within 30 days of completion of logging.  
ii) Perform a casing inspection log on the subject well by December 1, 2017, and submit results to the Commission within 30 days of the completion of logging. Thereafter, perform a casing inspection log at an interval of not more than every 10 years.  
iii) Perform a hydraulic isolation temperature log on the subject well by December 1, 2017 and submit results to the Commission within 30 days of the completion of logging. Thereafter, perform a hydraulic isolation log at an interval of not more than every 5 years.
  - k) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.
  - l) Prior to the scheduled testing date of December 1, 2017, limit the cumulative volume injected to 190,236 m<sup>3</sup>.

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

DATED AT the City of Victoria, in the Province of British Columbia, this 30<sup>th</sup> day of August, 2017.



Advisory Guidance for Order 00-02-002 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 not later than the 25<sup>th</sup> 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.