

June 19, 2017

3200-8400-32640-02

Jeremy Sarada
Regulatory Analyst
Direct Energy Marketing Limited
PO Box 4335, Station C
Calgary, AB, T2T 5N2

Dear Mr Sarada:

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL, AMENDMENT #1
DIRECT LEGEND CLARKE a-74-G/94-J-10; WA# 8226
CLARKE LAKE FIELD – SLAVE POINT ‘A’ POOL**

Approval for disposal of produced water, Order 02-02-005, was issued for the subject well, Slave Point formation, on March 20, 2002. The Commission is presently amending disposal well approvals to conform to current requirements.

The subject well was drilled directionally into the Clarke Lake Slave Point ‘A’ pool. The well produced gas from March 1994 to October 1995. Disposal into the well started in January 2003, and has continued until present, with 2,681,644 m³ disposed to date. In January 2017, a casing patch was installed across the slowly leaking stage cementing tool at 1430 mKB, after which an annular pressure test was successfully passed. The reservoir pressure in the well is presently at 75% of initial pool pressure.

Attached please find **Order 02-02-005 Amendment #1**, designating an area in the Clarke Lake field – Slave Point 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, reservoir pressure fill-up limit, and continuous tubing and casing pressure monitoring. 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,



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

Attachment



ORDER 02-02-005 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 'A' pool – Clarke Lake field as a special project in the following area:
NTS 94-J-10 Block G Unit 74
- 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 Direct Legend Clarke a-74-G/94-J-10; WA# 8226 – Slave Point 'A' pool (open hole from 2034.0 – 2041.2 mKB MD).
 - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 4,305 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 BC-S18 disposal statement.
 - h) Conduct a reservoir pressure test on the formation in the subject well once every 3 years, 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 23,930 kPaa, measured at 1964 mKB MD.
 - 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.
 - 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.
 - k) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 19th day of June, 2017.



ORDER 02-02-005 Amendment #1

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Advisory Guidance for Order 02-02-005 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 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.