

December 14, 2017

3200-8400-32640-02

Quattro Exploration and Production Ltd.
4110, 825 – 8th Avenue SW
Calgary, AB, T2P 2T3
c/o Gary Gwartney P.Eng
Veracity Energy Services Ltd., operating for
Hardie & Kelly, receiver

Dear Mr Gwartney:

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL, AMENDMENT #3
QUATTRO ET AL CLARKE c-89-F/94-J-10; WA# 3474
CLARKE LAKE FIELD – SLAVE POINT 'B' POOL**

Approval for disposal of produced water, Order 92-02-002, was issued for the subject well, Slave Point formation, on July 24, 1992. On July 26, 1993, Order 92-02-002 Amendment #1 was issued to change the approved injection interval to higher up in the wellbore. On January 16, 2017, Order 92-02-002 Amendment #2 was issued to bring the well up to current disposal well standards.

Attached please find **Order 92-02-002 Amendment #3**, designating an area in the Clarke Lake 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. Order 92-02-002 Amendment #2 included deadlines for a reservoir pressure test as well as wellbore integrity testing. The subject well has been inactive since March 2017. The new deadlines, included in conditions 2h) and 2j), now center around the date of disposal re-start in order to ensure compliance can be met during well transfer process.

Additional general information regarding disposal wells is available on the Commission's website at <http://www.bccgc.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 92-02-002 Amendment #3

- 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 – Clarke Lake field as a special project in the following area:
NTS 94-J-10 Block F Unit 89
- 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 Quattro et al Clarke c-89-F/94-J-10; WA# 3474 – Slave Point 'B' pool (perforations from 2056.2 – 2067.2 mKB MD).
 - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 4,500 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) Prior to re-starting disposal under this Order, 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, conduct a reservoir pressure test at an interval of not more than every 2 years.
 - i) Cease injection upon reaching a maximum formation pressure of 23,390 kPaa, measured at 2061.1 mKB TVD.
 - j)
 - i) Perform a cement bond log within 3 months of re-starting disposal under this Order. Submit results to the Commission within 30 days of the completion of logging.
 - ii) Perform a casing inspection log within 3 months of re-starting disposal under this Order, 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 log within 3 months of re-starting disposal under this Order, 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.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 14th day of December, 2017.

Advisory Guidance for Order 92-02-002 Amendment #3

- 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.