



February 11, 2015

7750-4800-32640-02

Rod McDougall  
Canadian Natural Resources Ltd.  
Suite 2500, 855 – 2nd Street SW  
Calgary, AB T2P 4J8

Dear Mr. McDougall,

**RE: TEMPORARY PRODUCED WATER DISPOSAL APPROVAL, AMENDMENT #1  
CNRL SEPTIMUS 13-9-81-18 W6M; WA# 25459  
SEPTIMUS FIELD - HALFWAY FORMATION**

The Commission has reviewed your email dated February 2<sup>nd</sup>, 2015, requesting a 10,000m<sup>3</sup> addition to the existing 20,000m<sup>3</sup> limit on the temporary approval 14-02-008 issued for the subject well.

The well injected 4,503m<sup>3</sup> between August 18th and September 8th, 2014. No fluids have been injected since. Results from CNRL's passive surface seismic monitoring array in the Septimus area as well as NRCAN data shows negligible seismic activity that can be associated with the disposal from this well. The well has operated within the conditions of approval 14-02-008, and no further risks have been identified. Based on this information, the OGC agrees that an additional 10,000m<sup>3</sup> of volume for temporary injection is acceptable.

Attached please find **Order 14-02-008 Amendment #1** designating an area in the Septimus field – Halfway formation as a Special Project under section 75 of the *Oil and Gas Activities Act*, for the use of a storage reservoir for the temporary disposal of produced water up to a **maximum volume of 30,000 m<sup>3</sup>**. The Commission requests that during this test period CNRL continue to monitor for any seismic events, and at the conclusion submit a seismic events report. The subject well may be re-evaluated as a candidate for continuous disposal, upon application, once the maximum injection volume has been reached and a review of any further technical submissions has been conducted.

This Order contains a number of detailed operational conditions. If the subject well is planned to be used for long term disposal, a better understanding of fluid dispersion into the Halfway formation is required. Condition g) states that a reservoir pressure test must be conducted on the well as soon as practicable after injection under this order has ceased. **Another reservoir pressure test would be required prior to any further injection into this well under a long-term approval.** These pressure values will help the Commission to understand pressure dissipation in the Halfway formation in this area. Additional general information regarding disposal wells is available on the Commission's website at <http://www.bccgc.ca/node/5997/download>.

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

Sincerely,

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

Attachment

cc: Dean Marcil, Shell Canada Ltd

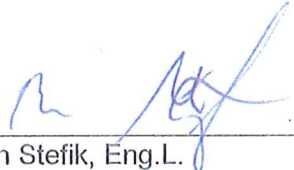
ORDER 14-02-008 Amendment #1

- 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 temporary disposal of produced water into the Halfway formation – Septimus field as a special project in the following area:

DLS Twp 81 Rge 18 W6M Section 9 - Lsds 11, 12, 13, and 14

- 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, including formation stimulation flowback, only into the well CNRL SEPTIMUS 13-09-081-18; WA# 25459 Halfway formation (disposal perforations 1945.5 – 1953.5 mKB).
- b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 12,400 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.
- e) Cease injection and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
- f) Include the disposal operating hours and the maximum injection pressure values on the monthly disposal statement.
- g) Upon conclusion of the cumulative injection volume (h), immediately run recorders in hole to perform a pressure fall-off test, with recorders on bottom for a 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.
- h) Cease injection upon reaching a maximum cumulative injection volume of 30,000m<sup>3</sup>, or a maximum formation pressure of 20,577 kPaa, whichever occurs first.
- i) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.
- j) Upon reaching the cumulative injection volume (h), submit a report to the Commission commenting on any seismic events proximal to the well location. This report must include event magnitude, frequency, and proposed mitigation plan should seismic events be connected to disposal operation.

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

DATED AT the City of Victoria, in the Province of British Columbia, this 11<sup>th</sup> day of February, 2015.

Advisory Guidance for Order 14-02-008

- I. A production packer must be set above the injection interval and the space between the tubing and casing filled with corrosion inhibiting fluids, as per section 16(2) of the Drilling and Production Regulation.
- II. Annual packer isolation tests are required, as per section 16(3) of the Drilling and Production Regulation.
- III. Injected fluids must be metered, 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.