



April 09, 2014

8120-2200-32640-02

Sam Coles  
Encana Corporation  
500 Centre Street SE  
P.O. Box 2850  
Calgary, Alberta  
T2P 2S5

Dear Mr. Coles:

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPLICATION  
ECA CRP SUNRISE 14-35-78-17 W6M; WA# 10677  
SUNRISE FIELD - CADOTTE FORMATION**

Oil and Gas Commission staff have reviewed the application, dated January 21, 2014 requesting approval to dispose of produced water into the Cadotte formation of the subject well. The subject well is part of a four well application for Dual Water Source and Water Disposal. The additional three wells are:

- ECA CRP HZ Sunrise A13-33-078-17 W6M; WA 26471
- ECA CRP HZ Sunrise 09-34-078-17 W6M; WA 28495
- ECA CRP HZ Sunrise A09-34-078-17 W6M; WA 28496

The subject well was originally drilled to the Montney formation and rig released October 14, 1997. The well was initially completed in the Bluesky and Cadomin formations in 1998 and 1999 respectively. Both formations were perforated, production tested and cement squeezed. The lower Montney formation was perforated and fracture treated in October 2000. In 2008, the upper Montney was perfered. Both zones were fracture treated and production tested. Two permanent bridge plugs were set, one above the upper Montney formation and the second above the Cadomin formation. The Cadotte formation was subsequently perforated at 974.5mKB to 1002.0mKB and fracture treated. A step rate injection test followed in Oct 2013 with a maximum rate of 2880 m<sup>3</sup>/d at 7760kPa, confirming along with other information that the Cadotte formation is suitable for water disposal.

Attached please find Order 14-02-005, designating an area in the Sunrise field – Cadotte 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 and well stimulation flowback fluid. This Order includes a number of detailed operational conditions including: continuous wellhead measurements, a maximum wellhead injection pressure, ultimate reservoir pressure limit, as well as wellbore integrity monitoring and reporting requirements. Disposal wells are subject to regular field inspection and audit. Contravention of a condition of this Order may be subject to enforcement under section 62 of OGAA, or suspension or cancellation of the Order under section 75(2)(b).

Encana long-term plans to build a water recycling facility in this area should reduce fresh water use. However, as indicated by Encana the three horizontal wells are currently completed as water source wells and will not be converted to water injection wells for a minimum of two years. Before granting water disposal to these wells the Commission requires confirmation that all data requirements for a disposal well(s) are met. Operation of the vertical well 14-35 will provide additional performance data as well. Additional general information regarding disposal wells is available on the Commission's website at <http://www.bcogc.ca/industry-zone/documentation/Subsurface-Disposal>.



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Should you have any questions, please contact Petra Kriescher-Trudgeon at (250) 419-4415 or Ron Stefik at (250) 419-4430.

Sincerely,

A handwritten signature in blue ink, appearing to read 'R. Slocomb', written over a horizontal line.

Richard Slocomb, P.Eng.  
Deputy Commissioner, Engineering  
Oil and Gas Commission

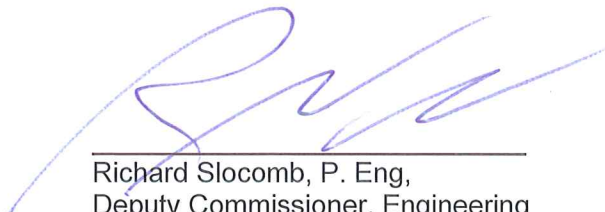
Attachment

ORDER 14-02-005

1. Under Section 75(1)(d) of the *Oil and Gas Activities Act*, the Oil and Gas Commission (Commission) designates the operation and use of a storage reservoir for the disposal of produced water, including flowback from fracturing operations, into the Cadotte formation – Sunrise field as a special project in the following area:

DLS Twp 78 Rge 17 W6M Section 35 - 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 well flowback completion fluids, only into the well ECA CRP Sunrise 14-35-78-17 W6M; WA# 10677 Cadotte formation.
  - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 14,400 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) 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 values on the monthly disposal statement.
  - h) Cease injection upon reaching a maximum formation pressure of 6,290 kPaa.
  - i) Conduct an annual reservoir pressure test on the formations 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.
  - 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, commencing from the date of initial disposal.
    - ii) Perform a hydraulic isolation 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.
  - k) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval.



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Richard Slocomb, P. Eng,  
Deputy Commissioner, Engineering  
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 9<sup>th</sup> day of April 2014.

Advisory Guidance for Order 14-02-005

- I. A production packer must be set above the injection interval and the space between the tubing and casing (including the space between the 3 packers) 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.