



May 2, 2017

8130-4520-32640-02

Leah Legacy
Project Delivery
Shell Canada Limited
P.O. Box 100, Station M
Calgary, AB T2P 2H5

Dear Ms Legacy,

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL
SHELL ET AL SUNSET 14-8-80-18; WA# 7640
SUNSET PRAIRIE FIELD – CECIL 'A' POOL**

The Commission has received Shell's application, dated March 21, 2017, for produced water disposal into the subject well, Cecil 'A' pool. The well was drilled down to Montney depth and rig released on March 15, 1992. The Halfway was completed but never produced. The Cecil produced oil from March to September 1991. The well was converted into a water injector in June 1997 to aid in the pressure maintenance waterflood project. Pool production has been shut-in since 2012 as uneconomic, following the recovery of approximately 37% of the initial oil in place. The pool is currently at around 50% of initial pressure, with remaining void space for disposal. The intention is to use this pool for the disposal of hydraulic fracture treatment flowback fluid.

Attached please find **Order 17-02-006**, designating an area in the Sunset Prairie field – Cecil 'A' 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 number of detailed operational conditions, including a maximum wellhead injection pressure, requirement for continuous tubing and casing pressure monitoring, and an ultimate reservoir pressure limit. Prior to disposal start, the Commission expects Shell to install a BP 10-20 m below the Cecil perforations to protect casing below the Cecil, install tubing with packer set above the Cecil perms, fill the annulus with corrosion-inhibiting fluid, and pressure test the annulus to 7 MPa. Additional general information regarding disposal wells is available on the Commission's website at <http://www.bcogc.ca/industry-zone/documentation/Subsurface-Disposal>.

For the inspection requirement of Order condition 2l), please arrange via email to OGCPipelines.Facilities@bcogc.ca.

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,

A handwritten signature in black ink, appearing to read "Ron Stefik".

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

Attachment

ORDER 17-02-006

- 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 Cecil 'A' pool – Sunset Prairie field as a special project in the following area:
DLS Twp 80 Rge 18 W6M Section 8 - 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 only into the well Shell et al Sunset 14-8-80-18; WA# 7640 – Cecil 'A' pool (disposal perforations 1844.0 – 1846.0 mKB).
 - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 25,570 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 an annual 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.
 - i) Cease injection upon reaching a maximum formation pressure of 26,500 kPaa, measured at 1845.2 mKB.
 - 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 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, 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.
 - l) Complete an inspection, satisfactory to the Commission, within 4 weeks of initial disposal operations.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 2nd day of May, 2017.

Advisory Guidance for Order 17-02-006

- 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.