January 5, 2024 4700-8400-32640-02

Stephen Penner
Exploitation Engineering Technologist
Canadian Natural Resources Limited
2100, 855 – 2nd Street SW
Calgary AB, T2P 4J8

Dear Mr. Penner,

RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL; AMENDMENT #2
CNRL HELMET d-79-A/94-P-07; WA# 2881
HELMET FIELD – SLAVE POINT 'B' POOL

The BCER has reviewed information provided by CNRL regarding disposal volumes and well integrity testing at the subject well.

The subject well produced gas from the Slave Point 'B' pool from April 1976 to December 1992. Disposal started into the subject well in February 2005. Since 1978 the reservoir pressure in the subject well has been maintained at approximately the same pressure, indicating an extensive aquifer accepting fluids. Additionally, the subject well has injected on vacuum since 2016. During a workover in June 2015, a casing inspection log was performed, which showed 14 casing joints with class 4 damage and one with class 5 damage. As such, casing inspection logs are required once every 5 years. The last casing inspection log was obtained on February 19, 2023 and showed no changes to the condition of the well since the 2015 log.

The Regulator hereby issues Order 04-02-004 Amendment #2, with the following changes:

a) Conduct twice annual packer isolation testing and submit a report of the test within 60 days of the end of the test.
b) Injection pressure, measured at the wellhead on the subject well, may not exceed of 1,000 kPag.
c) Casing pressure alarming is required to detect any variation greater than 250 kPag.
d) All other conditions of Order 03-02-004 Amendment #1 still apply, including the monthly volume limit of 1,000 m3. Should CNRL need to dispose of a larger volume, please contact the BCER Reservoir Engineering branch at reservoir@bc-er.ca.

Should you have any questions, please contact Michelle Gaucher at (250) 419-4482 or the undersigned at (250) 419-4430.

Sincerely,

Ron Stefik, P.L.Eng.
Supervisor, Reservoir Engineering
BC Energy Regulator

BRITISH COLUMBIA ENERGY REGULATOR

ORDER 04-02-004 Amendment #2

1 Under Section 75(1)(c.1) of the *Energy Resource Activities Act*, the Regulator 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 – Helmet field as a special project in the following area:

NTS 94-P-07 Block A Unit 79

2 Under section 75(2) of the Energy Resource 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 CNRL Helmet d-79-A/94-P-07; WA# 2881 – Slave Point 'B' pool (perforations 1911.6 – 1918.6 mKB).

b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 1,000 kPag or the pressure required to fracture the formation, whichever is lesser.

c) Not exceed a maximum volume of 1,000 m^3 injected per month.

d) Inject only through tubing with a packer set as near as is practical above the injection interval.

e) Continually measure and record the wellhead casing and tubing pressures electronically.

f) Alarm the annulus pressure monitoring system to indicate when casing pressure varies by more than 250 kPa outside the normal operating range.

g) Cease injection and notify the Regulator immediately if hydraulic isolation is lost in the wellbore or formation.

h) Submit twice annual packer isolation test report to the Regulator within 30 days of the completion of the test.

i) Include the disposal operating hours and the maximum injection pressure value on the monthly Petrinex reporting.

j) Conduct a reservoir pressure test on the formation in the subject well every 2 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.

k) Cease injection upon reaching a maximum formation pressure of 16,380 kPaa, measured at 1915.1 mKB.

l) i) Perform a casing inspection log on the subject well and submit results to the Regulator within 30 days of the completion of logging, at an interval of not more than every 5 years.

ii) Perform a hydraulic isolation temperature log on the subject well, and submit results to the Regulator within 30 days of the completion of logging, at an interval of not more than every 5 years.

m) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Regulator approval.

Ron Stefik, P.L Eng.
Supervisor, Reservoir Engineering
BC Energy Regulator

DATED AT the City of Victoria, in the Province of British Columbia, this 5th day of January, 2024.

Advisory Guidance for Order 04-02-004 Amendment #2

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.