

January 16, 2020

6800-4800-59240-09

Brittany Jorgensen
Canadian Natural Resources Limited
2100, 855 – 2nd St SW
Calgary, AB T2P 4J8

Dear Brittany Jorgensen:

RE: PRESSURE MAINTENANCE WATERFLOOD ORDER 66-09-001 AMENDMENT #8
PEEJAY FIELD – HALFWAY FORMATION CNRL UNIT #2

The Commission is presently reviewing and amending waterflood approvals to conform to current requirements. The continued operation of a pressure maintenance waterflood in the Peejay field – Halfway formation CNRL Unit #2 by Canadian Natural Resources Limited (CNRL) requires this review.

The discovery well, CNRL et al Peejay b-9-F/94-A-16 (WA 1598), was drilled and began production in February of 1965. An additional 49 wells were drilled and completed into the Unit between 1964 and 1973 and the remaining 11 were drilled between 1986 and 1995. Approval for waterflood was granted on October 24th of 1966 and injection began in March of 1967 into 10 injection wells. Subsequent amendments were granted to allow conversion of an additional 12 wells to injection service. Of the total 59 wells in the Unit, 27 are abandoned or abandoned zone, 22 are suspended, 6 are active production wells and 6 are active injection wells.

The following Orders are attached;

- 1) Order 66-09-001 Amendment #8 designating Pressure Maintenance Waterflood within the Peejay field – Halfway formation, as a Special Project under section 75 of the *Oil and Gas Activities Act*, and
- 2) Order 66-09-001 Amendment #8 - OTN approving Other Than Normal Spacing under section 65.1 of the *Petroleum and Natural Gas Act* for the subject area and formation.

This amended approval includes a maximum wellhead injection pressure (MWHIP), an ultimate pool pressure limit, restriction of injection for the purpose of oil recovery, the submission of annual packer isolation tests, and a requirement for annual reservoir pressure tests on the injectors. The ultimate reservoir pressure has been limited to the initial pool pressure. Only the six active injectors (WA 1657, WA 1684, WA 1749, WA 2821, WA 7493, and WA 9433) are approved for injection in the Order as all other injectors have been abandoned. Order condition 2i) requires packer isolation tests for injectors CNRL et al Peejay d-83-D/94-A-16 (WA 1749) and CNRL et al Peejay a-2-E/94-A-16 (WA 2821), as no 2019 tests have been received.

Please note that, as per section 75 of the *Drilling and Production Regulation*, a record of the volume of water injected and the MWHIP must be included on a Monthly Injection statement to the Commission via Petrinex not later than 20th day of the month following the reported month.

Should you have any questions, please contact Logan Gray at (250) 419-4465 or the undersigned at (250) 419-4430.

Sincerely,



Ron Stefik, EngL
Supervisor, Reservoir Engineering
Oil and Gas Commission

Attachments

Advisory Guidance for 66-09-001 – Amendment #8

- 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 completed and 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 injection statement must be submitted to Petrinex not later than the 20th 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 injection operations suspended as per section 21.1 of the Drilling and Production Regulation.



Ron Stefik, Eng.L.
Supervisor, Reservoir Engineering
Oil and Gas CommissionDATED AT the City of Victoria, in the Province of British Columbia, this 16th day of January 2020.




ORDER 66-09-001 – Amendment #8 – OTN

- 1 Under Section 65.1(2) of the *Petroleum and Natural Gas Act*, Other Than Normal Spacing within the Peejay field – Halfway formation is hereby approved within the following area;

NTS 94-A-16: Block C - units 58, 59, 60, 68-70, 78-80, 88-90, and 98-100
Block D - units 62, 63, 71-73, 81-83, and 91-93
Block E - units 1-3, 11-13, 22-26, 33-35, 43, 45, and 46
Block F - units 9 and 10

- 2 Under section 65.1(3) of the *Petroleum and Natural Gas Act*, I specify the following:

- a) the target area for an oil well completed within the project area is not nearer than 100 m to the sides of the Other Than Normal Spacing area,
- b) an oil well completed outside the specified target area may be subject to an off-target production penalty,
- c) oil wells drilled within the specified project area are not subject to spacing requirements.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 16th day of January 2020.