

July 12, 2021

2820-4800-59240-07

Brittany Jorgensen, P.Eng.
Exploitation Engineer
Canadian Natural Resources Limited
2500, 855 – 2nd St SW
Calgary, AB T2P 4J8

Dear Ms. Jorgensen:

**RE: PRESSURE MAINTENANCE GAS INJECTION ORDER 66-09-001 AMENDMENT #3
BULRUSH FIELD – HALFWAY ‘A’ POOL UNIT #1**

Canadian Natural Resources Limited (“CNRL”) was granted Concurrent Production approval Order 21-07-001 for the subject pool on June 4, 2021. The application, dated April 30, 2021, requested that the pressure maintenance gas injection approval Order 66-09-001 for this pool be retained, in the event of plant turnaround that would result in gas flaring or a significant change in gas and oil prices that could result in restarting injection operation.

The discovery well, CNRL et al Bulrush d-78-F/94-A-16 (WA 1267), was drilled in February of 1963. Four more wells were drilled in the 1960s and one final well, CNRL Bulrush c-79-F/94-A-16 (WA 11399), was drilled in 1998. The pool contains six wells, two active oil producers, one active gas injector, one suspended well, and two abandoned wells. Approval for gas re-injection was granted 1966 by Order 66-09-001. The approval was amended in 1989 to allow for water injection and again in 1998 to accommodate a newly drilled well in the pool, WA 11399. As stated above, the pool was approved for concurrent production (gas cap blowdown) on June 4th, 2021 by Order 21-07-001.

The following Orders are attached:

- 1) Order 66-09-001 Amendment #3 designating Pressure Maintenance Gas Injection within the Bulrush field – Halfway “A” pool, as a Special Project under section 75 of the *Oil and Gas Activities Act*, and
- 2) Order 66-09-001 Amendment #3 - OTN approving Other Than Normal Spacing under section 65.1 of the *Petroleum and Natural Gas Act* for the subject area and formation.

This approval is suspended and the concurrent production approval, Order 21-07-001, becomes effective when injection into the pool has ceased. Conversely, if injection recommences due to a change in operations or economics, the approvals are asynchronous and this approval becomes active, and approval Order 21-07-001 becomes suspended. The permit holder must notify the Commission when injection ceases or restarts within 15 days of cessation or restart.

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

Sincerely,



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

Attachments

ORDER 66-09-001 – Amendment #3

1. Under Section 75 (1)(a) of the *Oil and Gas Activities Act*, the Commission designates by Order the development and production of petroleum and natural gas from a pool using pressure maintenance gas injection enhanced recovery scheme within the Bulrush field – Halfway 'A' pool following area:

NTS 94-A-16 Block F – Units 78, 79, 88, 89, 98, and 99
 Block K – Units 8 and 9

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:

- a) The project unadjusted daily oil allowable (UDOAA) is 105.7 m³.
- b) All associated produced gas must be conserved.
- c) Gas may be injected into the well CNRL et al Bulrush d-9-K/94-A-16 (WA 1597), interval 1,128.6-1,132.3 mKB:
 - i) Inject only through tubing with a packer set as near as is practical above the injection interval.
 - ii) Not exceed an injection pressure, measured at the wellhead of 20,850 kPa or the pressure required to fracture the formation, whichever is lesser.
- d) Do not exceed an average pool pressure of 9,250 kPa measured at 402.0 mSS.
- e) Cease injection for the well listed in (c) and notify the Commission at Reservoir@BCOGC.ca immediately if hydraulic isolation is lost in the wellbore or formation.
- f) Include the monthly injected volume, injection hours and the maximum injection pressure value for the well listed in (c) via Petrinex.
- g) Injection must cease upon termination of production from the pool.
- h) This order is suspended when injection into the pool ceases and becomes active again when injection recommences.
- i) Notify the Commission at Reservoir@bcogc.ca within 15 days when injection into the pool ceases or restarts.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 12th day of July 2021.

Advisory Guidance for 66-09-001 – Amendment #3

- I. Packer isolation tests conducted must be submitted, as per section 16(3) of the Drilling and Production Regulation.
- II. Injected gas must be metered and the injection pressure measured at the wellhead, as per section 74 of the Drilling and Production Regulation.
- III. 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.
- IV. Seismic events must be reported and injection operations suspended as per section 21.1 of the Drilling and Production Regulation.

ORDER 66-09-001 – Amendment #3 – OTN

- 1 Under Section 65.1(2) of the *Petroleum and Natural Gas Act*, Other Than Normal Spacing within the Bulrush field – Halfway ‘A’ pool is hereby approved within the following area;
NTS 94-A-16 Block F – Units 78, 79, 88, 89, 98, and 99
 Block K – Units 8 and 9

- 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.
 - d) This order is suspended when injection into the pool ceases and becomes active again when injection recommences.



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

DATED AT the City of Victoria, in the Province of British Columbia, this 12th day of July 2021.