

Ryan Munro, P.Eng.  
Manager, Abandonment Engineering  
Canadian Natural Resources Ltd.  
Suite 2100, 8800 – 2ST SW  
CALGARY AB T2P 4J8

March 27, 2020

Dear Ryan Munro:

**Information Request No.1:  
Application to Alter the Condition of a Well for the Abandonment of the  
Arrowhead River K-35 well (ACW-2019-016-CNRL-K-35-WID1991)**

On February 27, 2020, the Office of the Regulator of Oil and Gas Operations (OROGO) received an electronic copy of a Well Approval application from Canadian Natural Resources Ltd. (CNRL) to Alter the Condition of a Well (ACW) for the abandonment of the Arrowhead River K-35 (WID 1991) well. In order to review CNRL's application, OROGO requires additional information, as set out in the attached Information Request No.1.

Please send your written responses and any associated correspondence to me by email at [orogo@gov.nt.ca](mailto:orogo@gov.nt.ca) or through OROGO's secure file transfer site.

Please submit your response on or before 4:00 p.m. on April 30, 2020. If you are unable to respond within this timeframe or have any questions, please contact me at (867)767-9097 or by email at [orogo@gov.nt.ca](mailto:orogo@gov.nt.ca).

Sincerely,

Janpeter Lennie-Misgeld  
Senior Advisor, Legislation and Policy

c. Arly Castillo, Regulatory Coordinator, CNRL

**Canadian Natural Resources Ltd. (CNRL)**  
**Application to Alter the Condition of a Well (ACW-2019-016-CNRL-K-35-WID1991)**  
**Information Request No. 1**

**1.1 Detailed Operations Program**

**Preamble:** Step 17 states “...*Pressure test pumping surface lines to the max well head working pressure (be sure not to exceed the MAWP of the lowest rated inline component)*”. All inline components should NOT be rated less than any proposed pressure test. Pressure testing is typically conducted to the well head pressure rating or formation pressure, whichever is the lesser.

Step 25 states “*Unseat hanger and release ON/OFF overshoot from double grip packer. Monitor well response. Kill well as required.*” This process step does not provide sufficient detailed procedural steps to determine how CNRL proposes to kill the well.

Step 26 states “*Confirm with Abandonment Superintendent if a scraper run is required based on well conditions.*” This process step does not provide sufficient detail to determine how CNRL would ensure that the internal surface of the casing is free of debris and/or scaling if a scraper run is NOT completed before installing the bridge plug.

Step 30 states “...*Cap bridge plug with a minimum 30 vertical metres (600 litres) of cement circulated into place with fresh water*”. This process step does not provide sufficient detail to determine the method(s) to be used for the preparation, introduction and circulation of the cement when placing the required 30 metres of circulated cement.

**Request:** Please submit an updated abandonment program that provides sufficient detail to determine how CNRL proposes to:

- 1) Safely conduct pressure testing of pumping surface lines as stated in Step 17;
- 2) Kill the well as stated in Step 25;
- 3) Ensure that the internal surface of the casing is free of debris and/or scaling if a scraper run is NOT completed before installing the bridge plug as stated in Step 26; and

- 4) Prepare, introduce and circulate the cement when placing the required 30 metres of circulated cement as stated in Step 30.

## **1.2 Isolation of Porous Zones**

**Preamble:** CNRL's abandonment program identifies three perforated porous zones (Keg River, Headless and Landry) in the open hole section of the well. The abandonment program does not demonstrate how CNRL would ensure compliance with section 56 of the *Oil and Gas Drilling and Production Regulations* (OGDPR), which requires the isolation of all oil or gas bearing zones and discrete pressure zones.

**Request:** Please submit an updated abandonment program that provides sufficient operational and geological detail to determine how CNRL will ensure isolation of all porous zones in the open hole section of the well.