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 S.W. Arrowhead M-35 well (ACW-2019-015-CNRL-M-35-WID1989)

On February 25, 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 S.W. Arrowhead M-35 (WID 1989) 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 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.

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-2019-015-CNRL-M-35-WID1989)
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 20 states "*Unseat hanger and unset double grip packer and allow elements to relax. 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 21 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 23 states *"Displace casing with fresh water to formation if possible; prior to setting bridge plug."* Section 6A of the *Well Suspension and Abandonment Guidelines and Interpretation Notes* (Guidelines) requires that the entire well bore must be filled with non-saline water.

Step 26 states "…*Cap bridge plug with minimum 15 vertical metres 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 15 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 20;

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 21;

4) Ensure compliance with Section 6A of the Guidelines which requires that the entire well bore must be filled with non-saline water; and

5) Prepare, introduce and circulate the cement when placing the required 15 metres of circulated cement as stated in Step 26.

1.2 Well bore Schematic

Preamble: The down hole schematic entitled S.W. Arrowhead M-35 – Proposed (Section 6, Page 31) does not indicate the proposed 15 vertical metres of cement circulated into place above the permanent bridge plug (572.5 mKB) on the vertical schematic drawing.

Request: Please submit an updated well bore schematic that includes the proposed 15 vertical metres of cement circulated into place above the permanent bridge plug (572.5 mKB) on the vertical schematic drawing.