



June 18, 2015

4000-2800-32640-02

Ian Radzichowsky
Newalta Corporation
211 – 11th Avenue SW
Calgary, AB T2R 0C6

Dear Mr. Radzichowsky:

**RE: APPLICATION TO INCREASE MAXIMUM WELLHEAD INJECTION PRESSURE
NEWALTA FT ST JOHN SE 15-5-83-17W6M; WA# 8130
CADOMIN FORMATION**

The Commission has received Newalta's submission, dated May 15, 2015, in response to the opportunity to review draft Order 94-02-002 Amendment #2 for disposal well Newalta Ft St John SE 15-5-83-17 (WA 8130).

Condition 2(c) of the draft Order specifies a MWHIP of 14,590 kPag. This number is based on a fracture gradient of 28kPa/m with a safety factor of 10%. This fracture gradient is based on completion information for wells in the Cadomin formation, and is consistent with the methodology and values approved for other disposal wells.

Geological studies mentioned in the Newalta application would indicate that the Cadomin formation is well developed and homogeneous over a large area, and that the subject well is disposing into a highly permeable aquifer of vast aerial extent. This behavior is not supported by well test data;

- A November 2013 reservoir fall-off test on the subject 15-5 well indicates slow pressure fall-off, belying the understanding of a homogeneous and continuous high permeability reservoir.
- December 2014 and January 2015 pressure tests at Newalta's offsetting Cadomin disposal well Newalta Ft St John SE 12-10-83-17 (WA 5407) show a highly overpressured zone at the wellbore, with very slow fall-off.

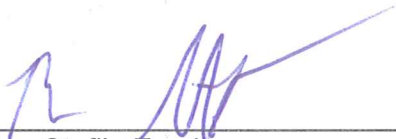
Other Cadomin disposal wells in this general area exhibit more favorable injectivity performance, capable of injection at similar rates to the subject well at a much lower MWHIP. These observations may be symptoms of near-wellbore/formation damage or compartmentalization of the Cadomin.

Step-rate tests performed after a significant fracture stimulation of the formation are not valid. A large fracture with proppant was performed on the subject well in August 1993 to stimulate the Cadomin formation. During the step-rate test performed on the subject well in November 2013 no formation break can be selected with any degree of certainty. The value picked by Newalta, a fracture gradient of 28.2kPa/m, corresponds to the OGC's value of 28. However, Newalta requests a MWHIP of 19,000kPa, which corresponds to a FG of 33kPa/m with a minimum 10% safety factor.

Newalta's request to continue disposing at or above the fracture pressure is a concern to the OGC. Understanding of disposal into underground reservoirs is constantly improving, and along with it the understanding of the risks that come with long term disposal at high pressures and reservoir fill-up. Newalta's proof that the well is not being fractured out of the zone of interest consists of a 1993 tracer log from the original fracture which indicates that the frac was contained within the perforated interval, as well as a 2013 temperature log that shows no significant flow above the top of perforation. However both of these logs can only provide assurance in the near-wellbore area. Beyond this point, it is difficult to make any determinations of fluid migration within or outside of the Cadomin.

At this time the Commission must deny Newalta's request to increase MWHIP based on the reasons listed above, and unless any other pertinent technical information is forthcoming, will be issuing the amended Order, as drafted, on **July 3, 2015**. Newalta is encouraged to examine other options to maximize disposal potential into this well.

Sincerely,



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