

Wabamun Carbon Hub - A Developers View

Author information – Jeff Kler

Affiliation – P.Eng

Summary

Enbridge has been investigating Carbon Sequestration for a decade. The initial Carbon Sequestration submittal competed (and lost) to Quest for Provincial funding. This paper will give a brief background on the original Project (Pioneer), and what has happened in the intervening years that have led to the development of the current day Open Access Wabamun Carbon Hub located just west of Edmonton, Alberta.

This will add to the session by allowing participants to step back and understand how their work product, interpretations, and advice, can contribute to a new carbon sequestration Hub. The final submission will follow the advancing of a once abandoned and mostly forgotten evaluation permit, to one of the most interesting possibilities in Alberta for carbon sequestration.

Novel/Additive Information

When Enbridge first started looking at Carbon Sequestration in 2010 there had not been a single sequestration lease awarded in Canada. This era pre-dates Quest (which began operation in November 2015ⁱ) and Boundary Dam (Fall of 2014ⁱⁱ).

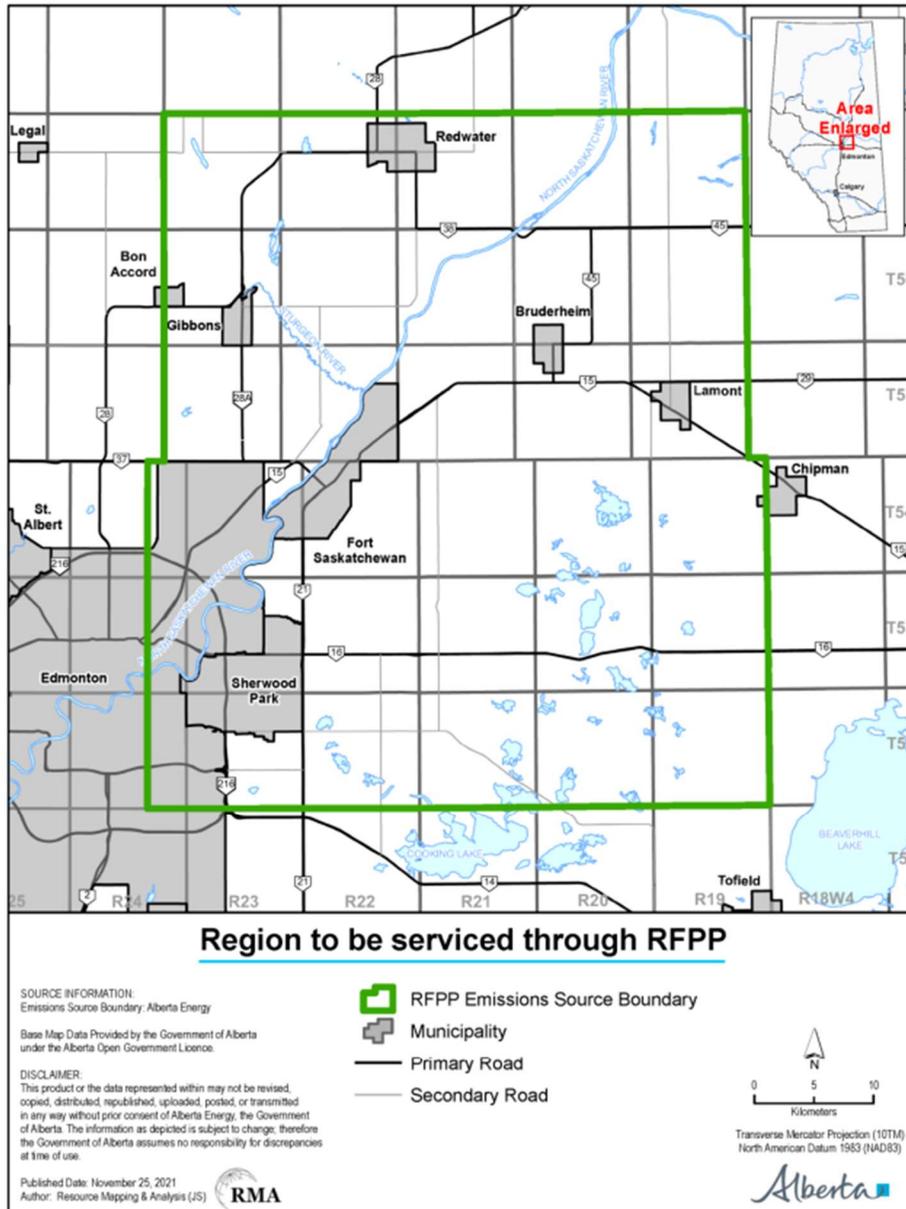
Enbridge's name and reputation is not usually synonymous with sub-surface activities in Western Canada. Less well known is that Enbridge owns and operates natural gas storage facilities. Enbridge owns or operates eight natural gas storage facilities in the U.S. and 36 natural gas storage fields at the Dawn Hub storage facility in Ontario, with a net working storage of about 438 billion cubic feet comprising approximately 350 active injection wells. The "Dawn Hub" is so named because it is connected to most of North America's major natural gas supplies, as well as to major demand markets. Like the spokes of a wheel, more than half a dozen major pipelines connect at the Dawn Hub facilitating over 100 companies actively trade at Dawn every dayⁱⁱⁱ.

For carbon sequestration Project Pioneer was started in 2010 by Enbridge, Capital Power and Trans Alta Corporation which aimed to capture 1 Mtpa of CO₂ from the Trans Alta Keephills 3 power plant. Unfortunately, deeper (Cambrian) formations were not evaluated at the time.

In 2021 Enbridge re-approached the initial funding partners of Pioneer. Capital Power is on the forefront of developing its Carbon Capture program with its announcement in December 2019 that it is progressing with is "Carbon Conversion Centre" to create carbon nanotubes^{iv} (the "U" in CCUS), and now to capture additional carbon dioxide and sequester right in the Wabamun area^v.

Lehigh cement has ambitions to be the worlds first to implement full-scale carbon capture in the cement industry^{vi} and is situated nearby to Capital Power and almost equidistance between heading West to a Wabamun Carbon Hub, and East to a Fort Saskatchewan Hub.

Under the current Alberta Provincial RFPP (Request for Full Project Proposal) requires the primary emission source come from within the Emission Source Boundary as outline in their submittal guidelines^{vii}. Neither Capital Power Genesee nor Lehig Cement Edmonton are located within this area.



Therefore, Enbridge is positioning the “Open Access Wabamun Carbon Hub” to be a feasible alternative to those emitters located on the east side of Edmonton and within the Emission Source Boundary. A brief overview of the options available to Sherwood Park and Fort Saskatchewan emitters will be briefly discussed in the full submission.

This submittal will also touch on the announcement made on February 3rd, that Enbridge and First Nation Capital Investment Partnership (FNCIP) announced plans to work together to advance the Open Access Wabamun Carbon Hub. FNCIP will also have the opportunity to co-own this new infrastructure. Also supporting the Hub is the Lac Ste. Anne Métis Community Association.

Enbridge has applied, with the support of the Indigenous partners, Capital Power and Lehigh Cement, to develop the Wabamun Hub through the Alberta government's competitive carbon hub selection process. If approved, significant parts of the Hub could be operational as early as 2025 and 2026.

Acknowledgements

The hosts of this session - Francis Morin and Marcia Coueslan

References

ⁱGovernment of Canada list of Current Investments: <https://www.nrcan.gc.ca/science-and-data/funding-partnerships/funding-opportunities/current-investments/shell-canada-energy-quest-project/18168>

ⁱⁱSask Power writeup on Boundary Dam Carbon Capture Project <https://www.saskpower.com/Our-Power-Future/Infrastructure-Projects/Carbon-Capture-and-Storage/Boundary-Dam-Carbon-Capture-Project>

ⁱⁱⁱ Enbridge Dawn Hub: <https://www.enbridgegas.com/storage-transportation/doing-business-with-us/our-dawn-facility>

^{iv} Capital Power public statement on GC3 project <https://www.capitalpower.com/wp-content/uploads/2021/02/Project-Specific-Information-Package-Genesee-Carbon-Conversion-Centre.pdf>

^v Capital Power press release on Carbon Capture https://www.capitalpower.com/media/media_releases/capital-power-and-enbridge-collaborate-to-reduce-co2-emissions-in-alberta/

^{vi} CCS Knowledge Center initiative: <https://ccsknowledge.com/initiatives/ccs-on-cement-lehigh-study>

^{vii} Alberta Carbon Sequestration Tenure Management Process: <https://www.alberta.ca/carbon-sequestration-tenure-management.aspx>