



Alberta Wilderness Association
"Defending Wild Alberta through Awareness and Action"

July 6, 2023

Moraine Power Generation Project
Impact Assessment Agency of Canada
9700 Jasper Avenue, Suite 1145
Edmonton, Alberta T5J 4C3
By Email: Moraine@iaac-aeic.gc.ca

RE: Moraine Power Generation Project

The Alberta Wilderness Association (AWA) appreciates the opportunity to provide comments for on the Moraine Power Generation Project proposed near Whitecourt, Alberta. Founded in 1965, AWA strives to help Albertans understand the intrinsic values that wildlife and wilderness provide, and encourage communities to participate in conservation initiatives that will ensure a legacy for future generations. With over 7,000 members and supporters in Alberta and across Canada, AWA is dedicated to conserving and protecting Alberta's wilderness.

The Moraine Power Generation Project is proposing to construct a new natural gas-fired power plant with carbon capture and storage. In addition to the power generation facility, where electricity will be produced, the project also proposes an approximately 10 km transmission line and two pipelines, for carbon dioxide and natural gas transportation, estimated to be 12 km and 30 km in length respectively.

AWA does not support continued development of natural gas infrastructure and has several concerns regarding the proposed project. Given the potential detriment to the environment, the risk to human and wildlife health and the expected carbon emissions, we suggest that the short-term benefits of this project fail to justify the costs of construction. Should the project proceed, we advise re-routing of pipelines and transmission lines to avoid wetlands and key biodiversity areas, extensive restoration of construction areas to functional native habitat, and long-term monitoring of the facility, transmission line, pipelines, carbon sequestration hub for changes to wildlife, vegetation or air, soil and water quality.

Alberta and Canada have committed to reducing carbon emissions, with an aim to have net-zero emissions by 2050. As of 2022, Canada's emissions are finally showing decline, though far from enough to meet the country's targets. In 2021, Alberta produced the most emissions of any province, and unlike other provinces, emissions have increased since 2005¹. The proposed project has promised to provide "near-zero" emissions, a difficult promise considering natural gas is a major emission source, producing 235.38 million tons of carbon emission in 2021², and the efficiency of carbon capture technology is still uncertain.

¹ Government of Canada. 2023. *Greenhouse gas emissions Canadian environmental sustainability indicators*. Accessed from: <https://www.canada.ca/content/dam/eccc/documents/pdf/cesindicators/ghg-emissions/2023/greenhouse-gas-emissions-en.pdf>

² Ritchie, H., Roser, M. & Rosado, P. 2020. *CO₂ and Greenhouse Gas Emissions*. Retrieved from: <https://ourworldindata.org/co2-and-greenhouse-gas-emissions>

Carbon capture technologies usually capture 90 percent of emissions, as higher efficiency becomes more expensive. However, research has also shown carbon capture at natural gas turbines to be less effective than suggested. Accounting for production and the electricity needed to run equipment, emissions were only reduced by an estimated 10 to 11 percent over 20 years, and the social costs (air pollution, health risks, economic expense, climate change contribution) were similar to or higher than fossil fuel generation without carbon capture³. Even with carbon capture technology, the project is expected to release 95,821 carbon dioxide equivalents per year of operation. This does not account for emissions produced during construction, including manufacturing of equipment and soil and wetland disturbance. The proposed project contradicts promises of “near-zero” carbon emissions and conflicts with Alberta and Canada’s goals for net-zero emissions.

Carbon capture and sequestration processes also pose several risks to the nearby environment. The project proposes carbon dioxide from the natural gas generator will be transported through 12 km of pipeline to the sequestration hub. Leakage from these pipelines could be catastrophic for nearby human and wildlife health. Carbon dioxide is an asphyxiant, and when released in high concentrations, can suffocate nearby towns. In 2020, a carbon pipeline rupture in Satartia, Mississippi hospitalized at least 45 people and evacuated more than 200, with many victims reported to suffer long-term health complications⁴. Pipelines can also contain contaminants, such as hydrogen sulfide. Along with carbon, these contaminants can leak into nearby soils and waters, causing acidification, reducing productivity and harming vegetation, wildlife and human inhabitants. The US Congressional Research Service has stated “Transporting CO₂ in pipelines is similar to transporting fuels such as natural gas and oil; it requires attention to pipeline design, protection against corrosion, monitoring for leaks, and safeguards against overpressure, especially in populated areas.”⁵ At minimum, safety requirements must be similar to pipelines carrying hazardous liquids, and must be constantly monitored for any signs of leakage or weaknesses with potential to rupture.

In addition, the sequestration and long-term underground storage of carbon is also known to carry risks. Stress produced on the rock mass trapping carbon, such as drilling or mining, can create fractures that allow carbon and other gasses to escape, contaminating nearby groundwater and soil⁶. Injection of carbon and acidification of groundwater can also mobilize toxic minerals, further degrading water quality⁷. Site selection for carbon sequestration is vital, as brittle capstones can crack under pressure,

³ Jacobson, M. Z. 2019. *The health and climate impacts of carbon capture and direct air capture*. Energy & Environmental Science, 12(12): 3567-3574.

⁴ Simon, J. 2023. *The U.S. is expanding CO₂ pipelines. One poisoned town wants you to know its story*. NPR. Retrieved July 7, 2023 from: <https://www.npr.org/2023/05/21/1172679786/carbon-capture-carbon-dioxide-pipeline>; US Department of Transportation. 2022. *Failure Investigation Report – Denbury Gulf Coast Pipelines LLC Pipeline Rupture/Natural Force Damage*. Retrieved from: <https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2022-05/Failure%20Investigation%20Report%20-%20Denbury%20Gulf%20Coast%20Pipeline.pdf>

⁵ Parfomak, P. W. 2022. *Carbon Dioxide Pipelines: Safety Issues*. US Congressional Research Service. Retrieved from: <https://crsreports.congress.gov/product/pdf/IN/IN11944>

⁶ He, M., Luis, S., Rita, S., Ana, G., Euripedes Jr, V., & Zhang, N. 2011. *Risk assessment of CO₂ injection processes and storage in carboniferous formations: a review*. Journal of Rock Mechanics and Geotechnical Engineering, 3(1): 39-56.

⁷ Gholami, R., Raza, A., & Iglauer, S. 2021. Leakage risk assessment of a CO₂ storage site: A review. Earth-Science Reviews, 223, 103849.

releasing carbon through permeable rock, and carbon injection has been found to cause earthquakes⁸. To minimize risk, a thorough assessment of the site must be conducted. The assessment must determine potential faults or weaknesses in the capstone layer, distance to groundwater, possible routes of carbon escape, and the impact of increasing pressure on rock layers caused by carbon injection. Further, drilling and mining near the carbon sequestration hub must not be permitted, as these actions risk weakening and fracturing the rock material, allowing stored carbon to escape. The risk of leakage may be minimized by cementing the well case, and long-term monitoring is needed. Prior to construction, baseline measurements should be taken for air quality, water quality, geology, vegetation and wildlife, and monitoring should address any deviation from this baseline.

As well, the proposed project could prove greatly damaging to the nearby environment. While the power generator facility (PGF) site is mostly on previously disturbed industrial landscapes, the transmission lines and pipelines are expected to pass through sensitive habitats, including wetlands, riparian areas, forests and a key wildlife biodiversity zone. These habitats support several rare and endangered species, including bull trout, Athabasca rainbow trout, arctic grayling and pygmy whitefish, trumpeter swans, grizzly bears, and several ungulates. These species will be heavily impacted by construction and operation of the proposed natural gas plant, and extensive reclamation will be required to return disturbed areas to a functional state.

In addition to risks of collision or pollution degrading landscapes and causing vegetation and wildlife mortality, transmission lines and pipelines can restrict wildlife movement and fragment habitat. Construction of pipelines causes heavy landscape disturbance and soil compaction, inhibiting vegetation re-establishment. Wetlands and riparian regions provide many benefits, including carbon storage, water and air filtration and providing habitat for many rare and endangered species. These landscapes are highly sensitive to disturbance and difficult to re-establish. The project and all components must avoid these sensitive regions, as well as Key Wildlife Biodiversity Zones, which are designed by the Alberta government to protect biodiversity. Avoidance of sensitive and high biodiversity habitats only during times of high wildlife activity is not sufficient to protect these ranges, or the wildlife that relies on them.

The project claims natural gas will supply “reliable” energy, as opposed to the “intermittent generation sources” or renewable energy. However, natural gas generators are known to fail under extreme weather conditions, including excessive heat or cold. In winter, when energy use is highest, freezing temperatures can cause wells and pipelines to freeze, resulting in natural gas generator outages, as occurred in Texas⁹, Tennessee¹⁰, and several other US States¹¹, despite efforts to improve infrastructure. Outages from grids

⁸ Gan, W., & Frohlich, C. 2013. *Gas injection may have triggered earthquakes in the Cogdell oil field, Texas*. Proceedings of the National Academy of Sciences, 110(47), 18786-18791.

⁹ Douglas, E. 2021. *Texas largely relies on natural gas for power. It wasn't ready for the extreme cold*. Texas Tribune. Retrieved July 7, 2023 from: <https://www.texastribune.org/2021/02/16/natural-gas-power-storm/>

¹⁰ Timms, M & Friedman, A. 2022. *What we know: TVA ordered rolling blackouts for the first time in 90 years amid freezing temps*. The Tennessean. Retrieved July 2, 2023 from: <https://www.tennessean.com/story/news/local/2022/12/23/why-tennessee-valley-authority-ordered-rolling-blackouts-in-nashville/69754538007/>

¹¹ Swartz, K. E. 2023. *US utility firms spent big preparing power grid for storms – and still failed*. The Guardian. Retrieved July 7, 2023 from: <https://www.theguardian.com/environment/2023/mar/19/us-gas-plants-power-grid-failures-polar-vortex>

using natural gas have also occurred throughout Canada¹², casting doubt on the reliability of natural gas. Climate change is expected to cause greater temperature extremes, and will likely lead to increased outages from natural gas generators.

Given the damage the project will cause, AWA questions whether the proposed project “is aligned with Canada’s objectives of achieving net-zero emissions from the electricity grid by 2035” and that alternative sources, including wind and solar, are “not technically and economically feasible of providing baseload and dispatchable net generation of 465 MW within a footprint similar to the Project.” New sources of carbon, including natural gas generators, need to be severely restricted to meet Canada and Alberta’s goals for net-zero emissions. Carbon capture technology presents several risks, and fails to adequately reduce emissions. The proposed project does not provide sufficient justification for the development of a new natural gas generator, and the project should be denied.

Thank you for considering our comments. We look forward to hearing your responsible decision.

Sincerely,

ALBERTA WILDERNESS ASSOCIATION

<Original signed by>

Ruiping Luo
Conservation Specialist

¹² Smellie, S. 2022. *Power outages have thousands shivering on Christmas Day as stormy conditions persist*. CTV. Retrieved July 7, 2023 from: <https://www.ctvnews.ca/canada/power-outages-have-thousands-shivering-on-christmas-day-as-stormy-conditions-persist-1.6208641>