

Public registry 6126.00 - Potash and Agri Development Corporation of Manitoba Ltd.
(PADCOM)

The following are reasons for my objection to the proposed horizontal selective solution mining and milling project.

According to Manitoba Classes of Development Regulation potash mine and mills fall under a Class 3 Development. In 1988, public hearings by the Clean Environment Commission were provided for the development of a potash mine at Russell, Manitoba by Canamax Resources.¹

- I request written reason as to why this proposed project is being handled differently and not assessed under Class 3 developments?

A 10 km radius is identified for potential effects from the project (3.2 Spatial Boundaries). This radius extends outside of Manitoba and would then dictate agreement from the province of Saskatchewan as per section 13.1 of the Manitoba Environment Act. Although the Hatfield Aquifer is mainly in Saskatchewan it extends into Manitoba and will be used by the proponent; a Water Rights License should be required from the Saskatchewan Water Security Agency.

The land slopes to the east, flowing to the Assiniboine River. (4.1.3)

Leaks/spills/contamination from the mill site and mining will flow to the Assiniboine River which flows into the Red River and Lake Winnipeg. The Impact Assessment Agency of Canada (IAAC) and Fisheries should be notified by PADCOM as required under IAAC guidelines and regulations to assess impacts from project operations on the Assiniboine River system. The city of Brandon and many towns use the River as a drinking water source. It is unclear if those obtaining drinking water from the River have been consulted.

- Provide a fish and fish habitat assessment.
- Provide a study for impacts from a brine release to the environment, groundwater and water bodies.
- Provide plans for mitigation of these impacts.
- What emergency measures will be provided to those obtaining drinking water from the Assiniboine River in the event of contamination from a brine spill? For those on private wells?
- Provide ground and surface water monitoring.

The project indicates “no overland brine pipelines” but the North Block area alone covers 3 townships; 19,20, 21, Range 29WPM1. A South Block is discussed, referenced, and shown in figures 3 and 9 however it is not made clear that it will never be developed.

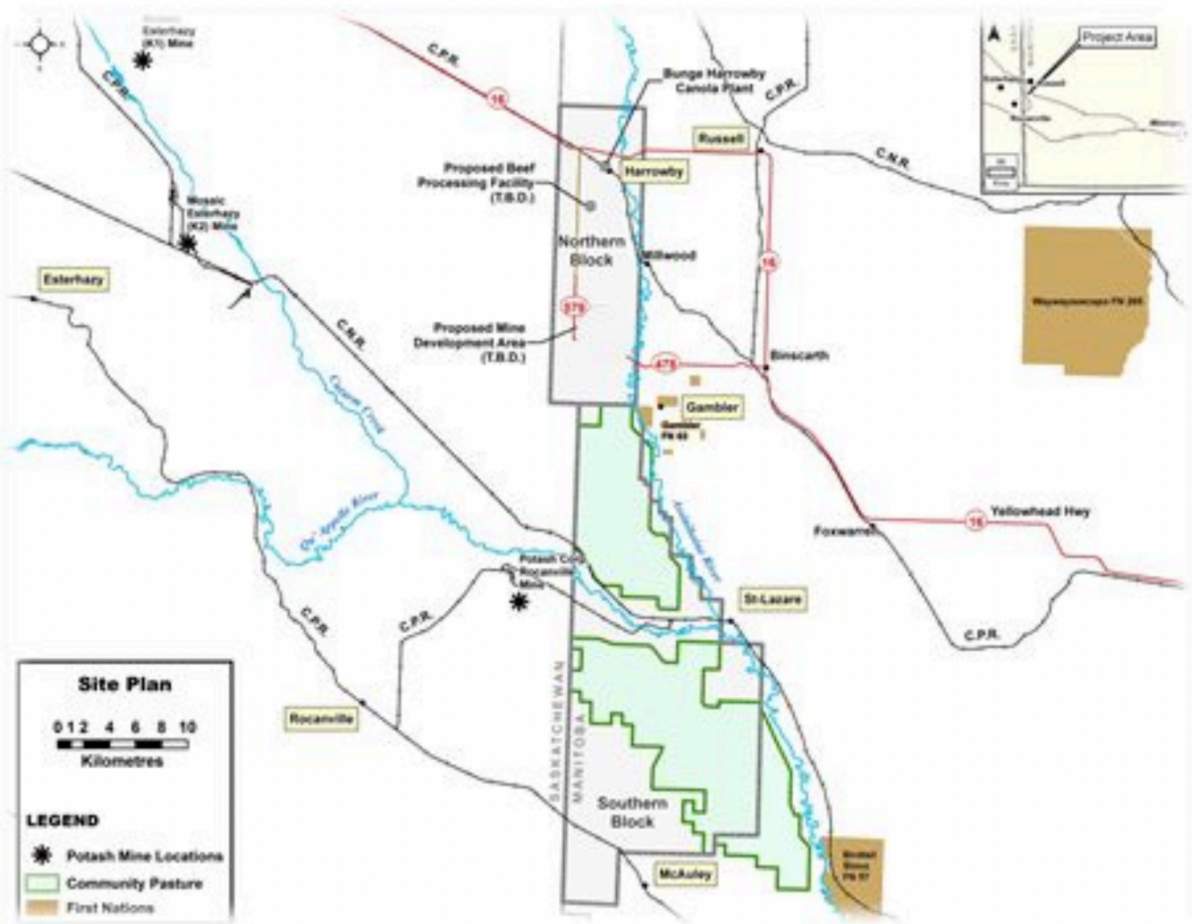
If not by pipeline, how does the brine make its way to the plant for the entire duration of the 100+ year project?

- How are corrosion and abrasion conditions from solution mining handled?

¹ <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.673.2433&rep=rep1&type=pdf>

- How are leaks/spills monitored? Leak detection, monitoring, cathodic protection, must be installed on the system.
- Provide a study on potential brine leaks to the underlying aquifer systems and water bodies including the Assiniboine River.

Figure 1. From PADCOM website; @ 2021 Manitoba Potash; <https://manitobapotash.ca> showing north and south mine blocks, community pastures, proposed beef processing facility and first nations.



There is no evidence that this area is home to wildlife, but it is assumed that wildlife passes through and grazes in the area. (4.2.2 Wildlife). Figure 1 shows the Ellice-Archie and Spy Hill community pastures. These two areas were designated as important bird and biodiversity areas by Nature Manitoba, Bird Studies Canada and Nature Saskatchewan in 2019 and is the first

important bird and biodiversity area in Manitoba to include another province, Saskatchewan.² Two globally threatened birds migrate and breed in the area. The Manitoba side is also home to 10 uncommon or rare Manitoba plant species, including Indian Rice Grass and Waxleaf Beardtongue. Although the North Block is just north of the Important bird area, the area contains these grasslands, wetlands, aspen forests, and the Assiniboine River system, surely there is an ecosystem present. The PADCOM proposal makes assumptions on “Biological Environment 4.2” wildlife, vegetation and fish; it lacks a detailed and thoughtful ecosystem study. It is insufficient for a 100+year potash mine/processing plant Environment Act Proposal. The area is beautiful and deserves a proper and comprehensive analysis.

- Provide a comprehensive assessment of ecosystems, wildlife in the entire project area including fish and fish habitat assessment.
- Provide a noise and light pollution study and impacts to wildlife, livestock and residents from all project operations including a cumulative impact study from neighbouring industry.

The project will go beyond 2050 requiring the project to meet Canada GHG emission reduction targets under Bill C-12 Canadian Net Zero Emissions Accountability Act and the Strategic Assessment of Climate Change(SACC). PADCOM must contact the IAAC regarding GHG emissions of the project and to determine federal jurisdiction.

- The project must comply to Bill C-12 and SACC.

Canada is one of the world’s top emitters for GHG emissions from fertilizers.

Canada can only reduce fertilizer emissions 30% below 2020 levels by 2030 by sustainable farming practices that do not rely on synthetic fertilizers. Increasing Canada’s potash footprint, regardless of technique used, is not sustainable development, is not a resilient project, and the movement towards getting off fossil fuels/chemical fertilizers to regenerative farming puts this project at odds and financial risk. As it is, the Manitoba Chamber of Commerce, now entrusted with the Manitoba Mineral Development Fund, announced funding of the PADCOM project of \$300,000 towards “phase 1 (test production) in the fall of 2020.”³ It is not in the best interest of Manitobans, Canadians and the planet to continue to subsidize fossil fuel development.

- How does an additional potash mine and mill enable Canada to reduce fertilizer emissions?

A decision has to be made for the next expansion, to use some gas or to convert entirely to electricity as an energy source (moving the mine to essentially zero carbon). (2.9.2 Natural gas/propane)

The project requires installation of a new gas pipeline to supply the volume required. Canada should not be installing gas pipelines, Canada should be eliminating fossil fuel reliance. As a new project that bases itself on reducing GHG emissions it is concerning that the project has not

² <https://www.cbc.ca/news/canada/manitoba/manitoba-saskatchewan-important-bird-area-1.5035100>

³ https://mbchamber.mb.ca/wp-content/uploads/2021/02/Approved-Projects_Website.pdf

considered producing its own energy rather than relying on fossil fuels, Hydro or combination thereof.

The proposal does not assess GHG emissions for the planned 250,000 tonnes per year of potash production. It states propane, diesel, gas, and hydro as energy choices to power the project but puts the decision off to the expansion phase. This does not provide for detailed GHG calculations. GHG calculations for diesel and transport of the product are missing from the proposal. Low to zero carbon emissions are supposed to occur at the end of the two year development period however there is no guarantee and no detailed and credible plan on how this will be achieved in accordance with SACC.

- Provide GHG calculations for all energy choices stated in the proposal for the planned 250,000 tonnes production per year.
- Provide GHG calculations for heating the freshwater, cooling the brine for crystallization, drying the potash, and reheating the brine for injection.
- Provide GHG calculations for equipment used to load the product and for truck and rail transport.
- Provide an economic feasibility report for supplying the plant with a new larger gas line required for the plant.
- Provide GHG emissions for all probable new connections in providing the new gas line from other industry and agriculture.

The initial 90-day production test estimates approximately 17 000 tonnes will be extracted in solution to 70 000 tonnes (Project Overview)

The project will begin at a 100,000 tonne per year rate for 90 days to confirm the design, (Executive Summary)

Add capacity to 250,000 tonnes per year over a two-year period. (1.5 Project planning phases)

Statements for time frames contradict other time frames in the proposal. The test and information and data contained in the Proposal seems to be for extraction volumes below the planned project capacity of 250,000 tonnes per year. After the test period the process design will be completed, a heat pump system will be selected, additional crystallizers, and new equipment will be installed. The proposal does not match the final project, emission calculations do not match the final project etc; the proposal is not developed to a level appropriate of a credible, comprehensive environmental assessment that will protect the environment and thus human health. An Environment Act License must not be granted to an experiment.

The product will be transported by truck and then eventually rail to markets in Canada, United States and internationally. (1.1)

As the selected location is adjacent to the rail line, PADCOM will be able to directly load the product from the Processing Facility to railcar in the future. As for now, trucking will be the primary mode of product transport. (1.4)

Sell the product to a single customer loaded on trucks. (1.5)

The proposal indicates looking at possible direct loading from the processing facility to railcar in the project planning phase(1.5) for 250,000 tonnes per year production and operations phase(3.1.2) The facility design does not provide for this probability; rail load out, car storage/ rail yard, spur line(s). The proposal should provide this information for rail assessment, to assess if feasible, what impacts will occur to neighbouring industries, residents and wildlife, increased rail traffic, noise and vibration.

The proposal compares truck traffic amounts from neighbouring Bunge Canola Plant, describes “semi truckload” use and calculates “7-8 truckloads” daily at the 100,000 tonnes production level that will occur for 90 days(executive summary).

The proposal files transportation of the product under “ancillary projects” (2.12) however transport is a necessary component of the project(3.1.2) and critical to its success, produces effects(road dust, infrastructure wear and tear, fugitive salt dust and potential contamination of vegetation, soil, and water systems, GHG) and should be assessed under this proposal, not dismissed from the project to a “trucking contractor”.(2.7.9)

Loading and transport of the product is avoiding environmental assessment. The entire project needs to be assessed for all impacts and cumulative impacts now.

- Provide GHG emissions from loading of product and transport via truck and rail.
- Provide a site plan for planned rail load out and rail yard.
- Provide a traffic study and mitigation plans on 250,000 tonne planned production capacity.
- Provide a traffic study and mitigation plans on impacts to wildlife, livestock and residents.
- Provide mitigation of fugitive salt dust in transportation.

The only “chemicals” used, include oil (local 35 api crude) for dust control on the product, and amine (octadecyl amine) for anticaking(executive summary)

The proposal does not contain material safety data sheet on all “chemicals” used. Amine⁴ is soluble in benzene⁵ which is found in crude oil. Both are toxic to aquatic life.

Applying amine and crude oil, a fossil fuel, to the potash will inevitably introduce it to the food chain, groundwater and water ways through agricultural operations, drainage practices, rain and snowfall. This is unacceptable and not the proper direction that Canada and Manitoba should be taking.

- Provide study on how chemicals and combining the chemicals will impact the environment.
- Source and use non toxic dust control and anti-caking agents.

The Beechy Solution Mining Technology has been developed over the last 10 years and included extensive lab testing and modelling.(Laboratory Testing and Modelling)

⁴ <https://pubchem.ncbi.nlm.nih.gov/compound/Octadecylamine>

⁵ <https://pubchem.ncbi.nlm.nih.gov/compound/benzene>

The technique has not progressed outside of the lab although the founder of Beechy has approached many in the Saskatchewan potash industry.^{6 7} Horizontal selective solution mining for potash is unproven. Why has the experienced Saskatchewan potash industry not team up with Beechy or trial the technique?

Two small scale selective solution potash mines in Saskatchewan have been exempted from EIS, having been ruled “not a project”. These two projects have a significantly larger footprint and emissions compared to the proposed PADCOM selective solution mine with PADCOM’s mine being less than 10% of the environmental footprint.(Executive summary)

No reference material is provided to support the statement of an environmental assessment exemption. It is unclear if the two small scale mines mentioned use the novel horizontal selective solution mining process. Regardless, under Manitoba Legislation potash mines and processing facilities are considered Class 3 developments and this project is avoiding conveyance of public hearings.

- I request written reason(s) as to why the Clean Environment Commission has not been convened.

Under “2.13 Alternative” the proposal is written in such a way that if the Beechy technology fails to live up to “laboratory testing and modelling” the only alternative is “conventional solution mine or typical underground mine”.

- Is the project licensing solely for the Beechy technology?

Manitoba Conservation and Climate needs to clarify this section and ensure only the Beechy technology is under review for licensing.

Presently the unit of interest is the Cretaceous age Swan River Formation (or Manville) which has been used and has a proven record for low pressure injection of waste salt brines. The alternative unit is the Devonian Winnipegosis Formation, (2.7.7 Brine Injection Well) The brine disposal is proposed to be drilled into the Winnipegosis Formation as is done at the potash mines in Esterhazy and Rocanville, Saskatchewan. (6.1.4 Brine Disposal)

- After continued use as a dumping zone for injecting materials, has the ability for these formations to accept further material been analyzed and calculated? Please provide.
- Determine if the formation can handle additional volumes of injected material from this 100+ year project.
- What is the safe pressurization for these formations?

⁶ <https://stockhouse.com/companies/bullboard/v.gsp/gensource-potash-corporation?postid=34057326>

⁷ <https://simsa.ca/news/simsas-junior-potash-2-0-event-features-legendary-persons/>

*A small brine injection well will be located as close to the plant as possible. (2.7.7)
two production wells and an injection well. (2.6)*

The proposal only indicates the use of 1 injection well.

- How does this 1 well service a project estimated at 100+ years?
- How many production wells are drilled for the entire project?
- How many injection wells are drilled for the entire project?

132 gallons (600 litres) of water for the production of one tonne of potash (1.3 Company Profile)
For 250,000 tonnes of potash water consumption would be 33,000,000 gallons. This amount of water is permanently removed from the aquifer system. The proposal lacks critical studies on sustainable water draw from the Hatfield Valley Aquifer and if additional use from the PADCOM potash mine and processing plant would compromise present users on both sides of the provincial border. The proposal provides a map of the Hatfield Valley Aquifer but only for the province of Saskatchewan.

- Is there sufficient knowledge of the aquifer systems in Manitoba?
- What is the sustainable yield of the aquifer from all users and can it handle the addition of this potash mine that has a 100+ year life?

It is unclear if indigenous consultations have occurred for all community members. It is unclear what public consultations have taken place and the outcome(s). The “advertisement” on the public registry fails to open.

As in the proposal for the CanWhite Sands project (Manitoba Public Registry 6057 & 6119) this Environment Act Proposal is for a project that uses a new mining technique, is still at an experimental stage, has no established safe outcome, and the Environment Act Proposals are limited to a small portion of the project yet request licensing for the entire project.

The PADCOM Potash Mine #6126.00 proposal only considers the “local project area” and not the true footprint of the 100+ year mine at 250,000 tonnes per year capacity. It lacks pertinent information and thus cannot be credibly assessed.

To ensure protection of the environment and human health, it must not receive an Environment Act License.