



Environmental Protection Operations Directorate
Prairie & Northern Region
9250 49 St
Edmonton, AB T6B 1K5

December 13, 2021

ECCC File: 4194-10-5/3302
CIAR File: 83207

Shelly Boss
Impact Assessment Agency of Canada
1145-9700 Jasper Avenue
Edmonton, AB T5J 4C3

By email to: shelly.boss@iaac-aeic.gc.ca

Dear Shelly Boss,

RE: Federal Authority Advice Record Request for the PADCOM Potash Solution Mining Project, Designation Request

ECCC has reviewed the information provided for the above-noted project (the Project) as requested by the Impact Assessment Agency of Canada's (the Agency) November 23, 2021 letter.

Our advice is based on ECCC's mandate in the context of the *Species at Risk Act* (SARA), the *Migratory Birds Convention Act 1994* (MBCA), pollution prevention provisions of the *Fisheries Act*, and the *Canadian Environmental Protection Act 1999* (CEPA).

ECCC will provide support and expertise to the Agency on an as-needed basis, when matters pertaining to our mandate and expertise are requested.



The Project Lead listed below can be considered your “one-window” contact into ECCC for coordination of ECCC’s participation in future on this project.

- Heather Konopski, Environmental Assessment Officer, at heather.konopski@ec.gc.ca
- The ECCC Prairie and Northern Region EA Generic Inbox at EASouthPNR@ec.gc.ca.

Sincerely,

<Signature removed>

Margaret Fairbairn
A/ Regional Director
Prairie and Northern Region

Cc: Gillian Brown, A/Head EA South, Environmental Assessment-Prairie and Northern Region
Heather Konopski, Environmental Assessment Officer, Prairie and Northern Region
Cari-Lyn Epp, Senior Environmental Assessment Officer, Prairie and Northern Region

Attachment: ECCC’s Federal Authority Advice Record for Designation Request

ATTACHMENT

Federal Authority Advice Record: Designation Request under IAA

Response due by **December 13, 2021**

PADCOM Potash Solution Mining Project

Department/Agency	Environment and Climate Change Canada
Lead Contact	Heather Konopski, EA Officer
Full Address	Environmental Protection Operations Directorate Prairie & Northern Region 150-123 Main Street Winnipeg, MB, R3C 4W2
Email	Heather.Konopski@ec.gc.ca
Telephone	N/A
Alternate Departmental Contact	Cari-Lyn Epp, EA Officer Cari-Lyn.Epp@ec.gc.ca

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1. Has your department or agency considered whether it has an interest in the Project; exercised a power or performed a duty or function under any Act of Parliament in relation to the Project; or taken any course of action (including provision of financial assistance) that would allow the Project to proceed in whole or in part?

Specify as appropriate.

ECCC has not previously considered the project, exercised a power or performed a duty, or taken any course of action as part of the Project.

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2. Is it probable that your department or agency may be required to exercise a power or perform a duty or function related to the Project to enable it to proceed?

If yes, specify that power, duty or function and its legislative source.

ECCC does not expect that it will be required to exercise a power or perform a duty or function related to the Project to enable it to proceed. During an assessment process this may change as additional activities or project components are identified. The information below is provided to assist if a permit is required.

Migratory Birds Convention Act permits

The Migratory Birds Convention Act 1994 protects migratory birds and their eggs and nests, wherever they occur, regardless of land tenure. The incidental take of migratory birds is a general prohibition and not a permit-able activity. ECCC notes that project construction and clearing activities are scheduled outside the migratory bird nesting season. In rare instances, Migratory bird permits may be required for activities that affect human health and safety, and that may cause injury to the use of the land, however the potential for permitting in these areas is anticipated to be case specific and at discreet locations, and unrelated to whether the project is able to proceed.

Species at Risk Act permits

Considering that the project is not located on federal lands, there are no orders (currently) in place, and the geography and small size of the project footprint, a *Species at Risk Act* (SARA) permit is highly unlikely to be required. It is possible that prohibitions may come into force in the future through orders in Council for individuals, residences and critical habitat on project-implicated, non-federal lands. If such an order is put in place, it may require a SARA permit. If such an order is placed, the information in the following paragraphs may be used to inform the need for a permit.

For species listed in Schedule 1 of the *Species at Risk Act* (SARA) as Extirpated, Endangered or Threatened, a permit may be required from ECCC (section 73 of SARA) for activities that affect a listed terrestrial wildlife species, any part of its critical habitat, or the residences of its individuals, where those prohibitions are in place. Such permits may only be issued: if all reasonable alternatives to the activity that would reduce the impact on the species have been considered and the best solution has been adopted; all feasible measures will be taken to minimize the impact of the activity on the species or its critical habitat or the residences of its individuals; and if the activity will not jeopardize the survival or recovery of the species. Permits are also required by those persons conducting activities that contravene the critical habitat destruction prohibitions (subsection 58(1)).

Prohibitions are in place for individuals and residences on federal lands in a province, reserve or any other lands under the *Indian Act*, or lands under the authority of the Minister of the Environment, and for birds listed under the *Migratory Birds Convention Act, 1994* wherever they occur regardless of land tenure.

Furthermore, prohibitions may be in force on land other than federal land pursuant to other orders or regulations under SARA. It is possible that further prohibitions may come into force in the future through orders in Council for individuals, residences and critical habitat on non-federal lands and / or through ministerial order for critical habitat on federal lands. It is also possible that, over the course of the assessment or after the assessment, additional species could be listed under SARA; permits may be required for project activities that affect these additional species. Proponents are advised to monitor for such developments on the SARA Registry <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>.

Examples of activities that could require a *Species at Risk Act* permit include:

- Species surveys that would affect individuals or residences;
- Site preparation (clearing, grubbing, site access, staging, blasting);
- Construction and operation of temporary and permanent works and infrastructure;
- Creation of new roads or power lines;
- Infilling of wetlands or watercourses;
- Any monitoring that requires capture/release of individuals; and
- Sensory disturbance effects (artificial lighting, noise, vibration, human activity, vehicular traffic).

ECCC will require detailed information on the potential effects of the project, including locations and/or occurrences of species at risk, their use of habitat and critical habitat within the project area, and specific effects on federal land, before ECCC can determine that a SARA permit would be required.

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3. If your department or agency will exercise a power or perform a duty or function under any Act of Parliament in relation to the Project, will it involve public and Indigenous consultation?

Specify as appropriate.

As per Question 2 above, it is unlikely that a SARA permit will be required. If a SARA permit is required for this project, ECCC may require public and Indigenous consultation related to the issuance of a SARA permit during the impact assessment process and will determine and action accordingly.

4. Is your department or agency in possession of specialist or expert information or knowledge that may be relevant to any potential adverse effects within federal jurisdiction caused by the Project or adverse direct or incidental effects stemming from the Project?

Specify as appropriate.

ECCC has specialist or expert information that may be relevant to the impact assessment in the areas listed below; in each of these subject areas we have expertise related to establishing an adequate baseline, assessing potential effects to biophysical valued components, effectiveness of mitigation measures, methods for monitoring and follow-up, as well as information regarding federal policies, standards, and regulations that may be relevant to the assessment (Note: ECCC does not assess proposed projects for regulatory compliance, but instead provides technical input to the Agency to inform the assessment). Once the scope of the project and of the assessment are established by the Agency, this list may change if additional project activities or components should come into scope.

Air Quality: ambient air quality; sources of emissions; emissions estimation and measurement; atmospheric transport, transformation and dispersion modelling; and follow-up monitoring.

Greenhouse gas emissions and climate change: estimations of greenhouse gas (GHG) emissions (net and upstream); carbon sinks; GHG mitigation measures and determination of Best Available Technologies/Best Environmental practices (BAT/BEP); credible plans to achieve net-zero GHG emissions by 2050; climate change science to inform evaluation of potential changes to the environment and project resilience to effects of climate change; climate change policies; and national GHG projections.

Water quality and quantity: surface water quality insofar as it could affect fish, fish habitat, and migratory birds; water quality predictions and modelling; contaminant sources for surface water; wastewater, seepage and runoff effects; management of contaminated soils or sediments; hydrology (streamflow rates data and modelling, and extreme events management, drainage control, water levels, water balances); geochemistry; follow-up and monitoring.

Wildlife, species at risk, and habitat: priority species and places as outlined in the *Pan-Canadian Approach to transforming species at risk conservation in Canada*¹; migratory birds, their nests, eggs, and habitat; COSEWIC² assessed species, species at risk, individuals, their residences, habitat and critical habitat including recovery strategies, action plans and management plans; ecotoxicology.

Environmental emergencies: emergency management planning and guidance; atmospheric transport and dispersion modelling of contaminants in air; fate and behaviour, hydrologic trajectory modelling of contaminants in water.

Climate and Meteorology: long-term climate patterns and norms and weather.

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5. Has your department or agency had previous contact or involvement with the Proponent or other parties in relation to the Project?

Provide an overview of the information or advice exchanged.

Based on information readily available, ECCC PNR has not had any involvement with the Proponent or other parties that would be relevant to the assessment of this project.

¹ <https://www.canada.ca/en/services/environment/wildlife-plants-species/species-risk/pan-canadian-approach/species-at-risk-conservation.html>

² Committee on the Status of Endangered Wildlife in Canada

6. From the perspective of the mandate and area(s) of expertise of your department or agency, does the Project have the potential to cause adverse effects within federal jurisdiction or adverse direct or incidental effects as described in section 2 of IAA? Could any of those effects be managed through legislative or regulatory mechanisms administered by your department or agency? If a licence, permit, authorization or approval may be issued, could it include conditions in relation to those effects?

Specify as appropriate.

Under the Impact Assessment Act (IAA), ECCC provides below scientific and technical information and knowledge on subjects within the department's mandate. Beyond the requirements of the IAA, ECCC has also identified other certain acts and regulations that may be applicable to the project. There is a possibility that by complying with these other regulatory requirements, the Proponent may be able to reduce some of the effects of the project on the environment. ECCC notes that this is not a comprehensive list of all applicable regulatory requirements that may apply to a project. ECCC also notes that the Impact Assessment process is a planning tool, and project compliance with ECCC's acts and regulations does not necessarily mean that a project would not result in negative effects.

Air Quality

Mining

The construction, operation, and decommissioning of mines can result in adverse effects on air quality. Mining operations, processing, and activities associated with combustion (including transportation, diesel generators, boiling, and drying) can result in the emission of contaminants such as sulfur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and particulate matter (PM_{2.5}, PM₁₀ and PM). Activities which cause a physical disturbance to land and mined salts, such as earth moving, land clearing, and transportation, can also introduce particulate matter (e.g., dust) to the surrounding region. The emission of these air contaminants can result in local or regional degradation of ambient air quality, with potential impacts on sensitive ecosystem receptors. Furthermore, emissions of air contaminants as a result of this project may add cumulatively to the emissions from other activities, contributing to degradation of air quality in the region. The proposed project is a solution mine project so on-site transportation and physical disturbance to land or ore material is lessened but air pollutants from stationary combustion may be increased due to the usage of boilers to heat water to send underground and dryers to dry the brine. Note that for PM_{2.5} in particular, ECCC has implemented the Code of practice for managing particulate matter emissions in the potash sector which may help control these emissions.

When contaminants settle out of the air in the surrounding environment, their deposition may result in adverse impacts to terrestrial and aquatic ecosystems. For example, emissions of NO_x and SO₂ may also lead to acidification and potential exceedance of ecosystems' critical loads. Air contaminant emissions can result in contamination of nearby land and waterbodies, and may affect sensitive ecosystem receptors.

Road and Rail Transportation Emissions

This project involves transportation of potash by rail which will result in an increase in demand for rail traffic. This has the potential to adversely affect air quality. More specifically, the combustion of fossil fuels to power the rail engines can result in the emission of air contaminants such as sulfur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and fine particulate matter (PM_{2.5}). When some contaminants settle out of the air in the surrounding environment, their deposition may result in acidification and potential exceedance of ecosystems' critical loads. The emission of these air contaminants can result in local or regional degradation of ambient air quality, with potential impacts on sensitive ecosystem receptors.

It is expected that this project will require on-road vehicles and mobile off-road machines for construction, operation and decommissioning, which have the potential to adversely affect air quality. More specifically, the combustion of fossil fuels can result in the emission of air contaminants such as sulfur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and fine particulate matter (PM_{2.5}). Note that since the proposed project is a solution mine, it is predicted to require less on-site transportation compared to conventional mines during the operation phase. When some contaminants settle out of the air in the surrounding environment, their deposition may result in acidification and potential exceedance of ecosystems' critical loads. The emission of these air pollutants can result in local or regional degradation of ambient air quality, with potential impacts on sensitive ecosystem receptors.

Greenhouse Gas Emissions and Climate Change

The construction, operation, and decommissioning of the proposed project may result in greenhouse gas (GHG) emissions or impacts to carbon sinks, and may hinder or contribute to the Government of Canada's ability to meet its commitments in respect of climate change. Furthermore, the project has the potential to be affected by future climate change, possibly resulting in impacts to the environment. Climate change may alter the likelihood or magnitude of sudden weather events such as extreme precipitation that can contribute to flooding, as well as contribute to longer-term changes such as sea level rise, permafrost thaw and changes to migration patterns. Changes related to warming are already evident in many parts of Canada, and are projected to continue in the future with further warming. If not properly considered, such changes may cause issues such as equipment failures that can threaten the environment, human health and safety, interrupt essential services, disrupt economic activity, and incur high costs for recovery and replacement.

The Strategic Assessment of Climate Change (SACC) (published in October 2020) provides guidance related to climate change throughout the impact assessment process. The SACC outlines information that the Proponent should provide during the impact assessment process on GHG emissions, impact of the project on carbon sinks, impact of the project on federal emissions reduction efforts and on global GHG emissions. GHG mitigation measures and climate change resilience; the circumstances in which an upstream GHG assessment would be required; and the circumstances in which a credible plan to achieve net-zero emissions by 2050 will be required.

More details are provided in the draft *Technical Guide Related to the Strategic Assessment of Climate Change: Guidance on quantification of new GHG emissions impact on carbon sinks, mitigation measures, net-zero plan, and upstream GHG assessment*, published in August 2021.

Climate Change Resilience

Given projected changes in future climate for the Project area, climate change considerations are relevant to the Project review. There is potential for climate change to effect the Project which, in turn, may have impacts on the surrounding environment (e.g. through accidents or malfunctions). Climate changes in the Project area, such as possible changes in mean and extreme precipitation and temperature and related environmental conditions, may alter baseline conditions, with implications for climate sensitive aspects of Project design and associated effects on the environment.

If the Proponent is required to prepare an Impact Statement, further information would be required through the Tailored Impact Statement Guidelines (TISG) on how the Project is resilient to and at risk from both the current and future impacts of a changing climate.

Water Quality

Mining

The activities linked to the construction, operation, and decommissioning of potash mining projects and the associated processing facilities can have adverse effects on the quality of groundwater and surface water.

The proposed Potash mine includes use and management of brine during mining and processing. This saline brine will require appropriate management and transportation to prevent potential impacts to surface waters. The project also proposes use of a process water pond to collect contaminated surface water and runoff, and states that surface water will bypass the pond during extreme precipitation events. Appropriate surface water management and pond sizing will be required to ensure that all potentially contaminated surface water and runoff is captured within the project site and not released into the aquatic environment, and clean un-impacted surface water and runoff is directed away from the site.

Project activities may produce airborne particulate matter which could also be a source of surface water contamination upon deposition. Contact water (including but not limited to: wastewater, runoff, seepage, discharges and spills) contains contaminants that could potentially effect water quality. Water quality could also be impacted by other mine-related releases, including sewage, chemicals, and other wastes.

Surface water quality may also be degraded by interactions between groundwater and surface waters in the project area. The use of water in mine production has the potential for contaminants to enter groundwater through seepage from the un-lined process water pond or through the brine injection/disposal wells. These contaminants could then be transported to aquatic receiving environments, resulting in possible adverse effects to water quality. Adverse effects to water quality could, in turn, result in adverse effects to sensitive ecosystem receptors.

Wildlife, species at risk, and habitat

Mining

The activities linked to the construction, operation, and decommissioning of a potash mine and processing facility could have negative effects on terrestrial wildlife, migratory birds and species at risk (e.g. amphibians, arthropods, birds, lichens, terrestrial mammals, mosses, reptiles, and vascular plants) listed on the *Species at Risk Act* (SARA), and their habitat (e.g. wetlands) and critical habitat.

The nature of effects to wildlife and habitat (including residences and critical habitat defined under the SARA) can vary based on a number of factors, including: project location, duration, scale, and configuration; ancillary project activities (e.g., land clearing, water withdrawals and diversions, rail shipping); existing cumulative effects; the type of habitat that may be disturbed; and sensitivity of species found in the project area. The pathway through which potential effects are conveyed will depend on the land, air, and water constituents associated with the site along with the behavioral adaptability, presence and interaction with the species limiting factor (e.g. habitat supporting staging, nesting, roosting or foraging) and population resilience.

There is no Critical Habitat for any species listed on Schedule 1 of the *Species at Risk Act* on or within 10 km of the proposed potash processing site. There are, however, multiple Species at Risk that have ranges that overlap with the processing site. Should any Species at Risk or migratory birds (or their habitat features such as nests, roosts, hibernacula) be identified on the project site, the following information should be considered.

Migratory Birds and Species at Risk and their Habitat

In the absence of applicable regulatory tools on federal lands, the Species at Risk Act requires effects on species at risk and their critical habitat be identified, avoided, mitigated and monitored by the Impact Assessment Agency should an IA be required (i.e., SARA s. 79). As per the response to Question 2, in the unlikely event that a permit would be required under the *Species at Risk Act*, it may include conditions constructed to address potential effects to species at risk.

Individual mortality and the destruction of nests and eggs or any other structure necessary for the reproduction and survival of species of risk could occur during all project phases, Exploration and construction of mines and associated infrastructure usually contribute to large-scale land clearing activities, which leads to destruction, disturbance and fragmentation of habitat (e.g., foraging, nesting, hibernating), habitat avoidance, sensory disturbance, and the inadvertent disturbance and destruction of individuals, nest and eggs of migratory birds and species at risk.

There is a higher risk that these effects would be more severe for migratory birds that are also species at risk and species where habitat is sensitive to disturbance (e.g., wetlands) or where there is already a high degree of cumulative effects to habitat or individuals. Destruction and/or disturbance of habitat can have increased impacts on species at risk individuals, residence and their critical habitat, which can lead to changes in prey and predator dynamics, loss of food resources, loss of breeding areas, changes in migration or movement, and increased risk of mortality. For example, certain species at risk (e.g. turtles) and migratory birds (e.g. Bank swallows, Common nighthawk) may nest in large piles of soil left unattended/unvegetated during the most critical period of breeding season. Other species at risk (e.g. bats) rely on summer and fall roosts and winter hibernacula that may have conditions (e.g. humidity) disturbed by blasting and vibration associated with underground mining activities.

Where a mining project requires new road infrastructure or an increase in capacity to existing road networks, the increase in road traffic volumes are likely to result in an increase in wildlife injury, mortality, and the introduction of invasive species (e.g., Common Reed (*Phragmites australis*) and hunters/poachers. Although adverse direct effects to migratory birds and their nests are typically managed through appropriate scheduling of activities outside of the breeding season, collisions with vehicles and associated infrastructure can result in direct mortality of wildlife. Effects will be most acute during the operation phase as this is when the most pronounced and sustained increase in vehicle volume is expected.

The construction, operation and decommissioning of mines may impact wildlife directly and indirectly through impacts to habitat through changes in geomorphological processes (e.g., sedimentation processes, water quality and quantity). Additionally, birds that land on and/or frequent wastewater (e.g., submerged tailings in tailings ponds, pit water) have the potential to come into contact with toxic substances which can result in on and off site mortality. During construction, operation, maintenance and decommissioning, there is the potential for harmful substances to enter or be spilled into the receiving environment that may

negatively affect wildlife. Depending on the nature of the release (e.g., toxicity, volume release, exposure pathways), effects to wildlife could be acute, chronic or both. Changes to water quality and quantity can affect migratory birds, wildlife, and their habitat.

Noise, vibrations and light from construction and operation activities may result in habitat disturbance which can lead to avoidance of use. Attraction to lights at night or in poor visibility conditions during the day may cause birds to collide with lit structures or their vertical support structures, resulting in injury or death. In other instances, birds can get disoriented while circling a light source, and may deplete their energy reserves and either die of exhaustion or drop to the ground where they are at risk from predation.

ECCC notes that although the project site consists of only a 1 hectare potash processing facility, there may be additional adverse effects to wildlife from the construction and operation of infrastructure required to collect and transport the potash materials that will be processed at the subject facility. Additional information regarding the supporting infrastructure will be required in order for ECCC to provide further advice on potential effects.

Environmental Emergencies

Mining

The proposed mining project includes an intake well of potash brine, a centrifuge, a product dryer, heavy mobile equipment, a downhole injection brine well and a pipeline crossing water bodies. As such, there is potential for adverse environmental effects from accidents and malfunctions, such as well ruptures, chemical spills involving oil and amine, and fuel spills from heavy trucks, and hot brine spill in water. Adverse effects to air quality, water quality, wildlife and wildlife habitat could result from the accidental release of, hydrocarbons, and other contaminants to surrounding waters. Optimized spill prevention, preparedness and response measures and systems will be important given the risk of spills of hazardous substances to the environment, especially to nearby waterways and environmentally sensitive areas.

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7. Does your department or agency have a program or additional authority that may be relevant and could be considered as a potential solution to concerns expressed about the Project? In particular, the following issues have been raised by the requester:
- a. Impacts on water quality through expected or accidental release (e.g., hot brine spills/leaks)
 - b. Impacts on water quantity due to withdrawal from aquifer
 - c. GHG emissions
 - d. Pipeline crossings of watercourses, rail and transmission lines
 - e. Effects to fish and fish habitat

If yes, please specify the program or authority.

Please see responses to Question 6.

It is the responsibility of the Proponent to comply with the following requirement; Environment and Climate Change Canada administers Section 36(3) of the *Fisheries Act*, which prohibits the deposit of deleterious substances into waters frequented by fish, unless the deposit is authorized by regulations. The owner/operator will be required to ensure there are no deposits of deleterious substances that would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat.

8. If your department has guidance material that would be helpful to the Proponent or the Agency, please include these as attachments or hyperlinks in your response.

ECCC is in possession of the following material that would be helpful to the Proponent or the Agency;

SARA registry

- [Species at risk public registry - Canada.ca](https://www.canada.ca/en/species-at-risk/public-registry)

ECCC's Guidelines to Reduce Risk to Migratory Birds

- <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratorybirds/reduce-risk-migratory-birds.html>

Federal Sustainable Development Strategy

- <https://www.canada.ca/en/services/environment/conservation/sustainability/federal-sustainable-development-strategy.html>

Strategic Assessment of Climate Change

- <https://www.strategicassessmentclimatechange.ca/>

Margaret Fairbairn

Name of departmental / agency responder

A/Regional Director, Environmental Protection
Operations

Title of responder

December 13, 2021

Date