



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

September 10, 2021

ECCC File: 20-MB-001
CIAR Reference: 80974

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

Via email : <email address removed>

Dear Ian Martin,

RE: Request for Federal Expert Advice - Review of information on the potential effects of the Vivian Sand Extraction Project

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) August 16, 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)*, the pollution prevention provisions of the *Fisheries Act*, and the *Canadian Environmental Protection Act 1999 (CEPA)*.

ECCC previously provided advice to the Agency regarding the Designation Request for the proposed Vivian Sand Processing Facility Project and Vivian Sand Extraction Project on September 14, 2020. Recommendations provided in 2020 focused on the processing facility component as no specific information was available regarding the extraction facility project at the time. The recommendations we provided in 2020, along with the information in this letter which focuses on the Vivian Sand Extraction Project, may be considered by the Agency.

ECCC's advice (attached Federal Authority Advice Record) has been prepared to inform the Agency's recommendation to the Minister regarding designation of the Project pursuant to subsection 9(1) of the *Impact Assessment Act (IAA)*.

ECCC Conclusion:

ECCC is of the view that the activities associated with the Vivian Sand Extraction Project may result in adverse environmental effects within federal jurisdiction as defined under the Impact Assessment Act (Section 2), including potential effects on species at risk, migratory birds, water quality and air quality.

Should you require further information, please do not hesitate to contact:

- Heather Konopski, Environmental Assessment Officer, at <personal information removed> or <email address removed>
- Orlagh O'Sullivan, A/ Senior Environmental Assessment Officer, at <personal information removed> or <email address removed>
- The ECCC Prairie and Northern Region EA Generic Inbox at ec.rpn-see-eapnr-s.ec@ec.gc.ca .

Sincerely,

<Original signed by>

Margaret Fairbairn
A/ Regional Director
Prairie and Northern Region

Cc: Gillian Brown, A/Head EA South, EA Prairie and Northern Region
Heather Konopski, EA Officer, Prairie and Northern Region
Orlagh O'Sullivan, A/Senior EA Officer, Prairie and Northern Region

September 10, 2021

ATTACHMENT: Federal Authority Advice Record

Response due by September 9, 2021 (ECCC notified Agency of one day delay)

Vivian Sand Extraction Project

Registry number: 80974

Department/Agency	Environment and Climate Change Canada
Lead IA Contact	Heather Konopski, EA Officer
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Email	<email address removed>
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Alternate Departmental Contact	Orlagh O'Sullivan, EA Officer <email address removed>

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1. From the perspective of the mandate and area(s) of expertise of your department or agency, does the Extraction 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?

ECCC has reviewed the documents submitted by the Proponent for their Manitoba *Environment Act* Proposal (EAP) and identified the following potential adverse effects within federal jurisdiction, as a result of the Vivian Sand Extraction Project:

Air Quality:

The construction, operation, and decommissioning of silica sand extraction activities can result in adverse effects on air quality. Extraction operations and activities associated with combustion (including transportation) 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, such as earth moving, land clearing, and transportation, can also introduce particulate matter (e.g., dust and soot) to the surrounding region. The emission of these air contaminants can result in to 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.

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, metals and polycyclic aromatic compound (PAC) emissions from mining activities may result in elevated concentrations of these contaminants in water, soil, flora, and fauna. 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.

ECCC's review of the Air Quality Assessment considered the validity of the proponent's assessment and mitigation measures.

There are residences as close as 133 meters to proposed well cluster areas. Elevated concentrations of nitrogen dioxide are expected to occur at nearby receptors as a result of Project activities. This is primarily due to the operation of diesel vehicles and equipment. Concentrations of NO₂ have the potential to exceed the 1-hour Canadian Ambient Air Quality Standards (CAAQS) as the operations schedule is 24 hours per day/7 days per week. This impact may be mitigated by the use of newer vehicles/equipment with lower emissions. Extraction activities near residences would best be performed during the summer months when vertical mixing of emissions by the atmosphere is maximized.

Greenhouse Gas Emissions and Climate Change:

The construction, operation, and decommissioning of the proposed project may result in greenhouse gas (GHG) emissions, 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 process on GHG emissions; impact of the Project on carbon sinks; the impact of the Project on federal emission reduction efforts and on global GHG emissions; GHG mitigation measures; 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 detail is provided in the draft Technical Guide Related to the Strategic Assessment of Climate Change: Guidance on quantification of net GHG emissions, impact on carbon sinks, mitigation measures, net-zero plan and upstream GHG assessment, published in August 2021.

Net GHG Emissions

In section 6.3.2 of the Proponent's provincial *Environment Act* Proposal, the Proponent provided an annual estimate of GHG emissions of 6,797,411 kg CO_{2e} per year over the anticipated 24-year life of the project). This estimate includes GHG emissions from equipment and power consumption. The methodologies used to estimate GHG emissions were not provided. Also, ECCC noted that GHG emissions from land-use change were not considered.

Each year, construction, operation and decommissioning activities are to be completed progressively at sequential well cluster locations. In the event that commencement of the Project is delayed, or the anticipated life is extended beyond 2050, the Project, if designated, would require a net-zero plan.

If the Proponent is required to prepare an Impact Statement, further information on GHG emissions, impact of the project on carbon sinks, impact of the project on federal emissions reduction efforts and on global emissions will be required through the Tailored Impact Statement Guidelines (TISG) (or equivalent document) as per section 5.1.1; 5.1.2 and 5.1.3 of the SACC. More detail is provided in the draft Technical Guide Related to the Strategic Assessment of Climate Change: Guidance on quantification of net GHG emissions, impact on carbon sinks, mitigation measures, net-zero plan and upstream GHG assessment, published in August 2021.

Upstream GHG Emissions

If designated, the Proponent will not likely be required to do an upstream GHG emissions assessment, i.e. an assessment of domestic and non-domestic emissions from all stages of production, from the point of resource extraction or utilization to the project under review.

Means and Mitigation Measures

If designated, in the Detailed Project Description, as outlined in Section 4.1.3 of the SACC, the proponent

- should discuss the potential impacts of the alternative means of carrying out the Project on GHG emissions and how GHG emissions were considered as a criterion in the alternatives selection; and
- are encouraged to provide information on the mitigation measures being considered to reduce the Project's GHG emissions on an ongoing basis, including technologies and practices measures (including best available technologies (BAT) and best environmental practices (BEP)).

The Proponent's *Environment Act* Proposal states that production of GHG emissions will be minimized by regularly maintaining equipment and vehicles, minimizing idling of vehicles, and use of vehicles and equipment that will meet required emissions standards.

If the Proponent is required to conduct an Impact Statement, further information would be required through the Tailored Impact Statement Guidelines (TISG) regarding mitigation measures including a BAT/BEP determination.

Water Quality and Quantity

The Proponent's *Environment Act* Proposal for the Vivian Sand Extraction Project indicates that the project does not require the use of surface waters, and no discharges to surface waters will occur as part of the Project. In addition, the proposal states that there are no natural water bodies or fish bearing water bodies within the Project Area. The Proponent has identified the potential for impacts to water quality due to spills and erosion, and has provided preliminary information on the erosion and sediment control plan and the environmental emergency response plan. Impacts due to erosion and spills should be mitigated through standard mitigation measures to be outlined in management plans. Based on these statements and the limited proximity to surface waters it is unlikely that the sand extraction project will have impacts on surface waters and aquatic life due to direct discharges or surface runoff.

The water source associated with the project includes a closed-loop system of groundwater withdrawal and re-injection into the aquifer. The Proponent characterizes changes to groundwater quality as minor. The Proponent acknowledges that rigorous monitoring will be undertaken as part of the Groundwater monitoring and Impact Management Plan in order to confirm the predictions of the Hydrogeology and Geochemistry. It is stated that this monitoring will include establishing the zone of influence, and any impacts on groundwater quantity and quality. ECCC agrees that monitoring of groundwater quality is an important aspect to reduce uncertainty and assess potential impacts to groundwater quality due to removal and reinjection of groundwater. Impacts to surface water quality due to changes in groundwater quality would be based on the potential connectivity of the groundwater and nearby surface waters. ECCC defers to the expertise of NRCan on matters of groundwater quantity and connectivity to surface waters. If the groundwater quality is altered by the project, with sufficient connectivity to surface waters, there would be the potential to impact surface water quality.

The Proponent acknowledges that surface storage of the bedrock cuttings that are produced as part of the drill process may result in metal leaching (ML)/ acid rock drainage (ARD) through exposure of sulphidic minerals to oxygen. It is stated that the development of the Waste Management Plan will include geochemical testing of drill cuttings (laboratory or field) to evaluate the behavior of the rock under field conditions. This will require proper storage and adequate testing such that appropriate management and mitigation may be implemented and impacts to surface water quality are prevented. In addition to geochemical testing, follow-up monitoring of drainage and runoff from any drill cutting storage piles should be completed to confirm that ML/ARD is not occurring.

Mining projects may result in adverse effects to surface water quality through "drawdown" of the water table – that is, a lowering of the water table underground. Water table drawdown can happen due to

removal of water from constructed wells; in this case to extract a sand slurry. The “drawdown” of a water table can have an impact on surface water quality by reducing the quantity of groundwater available to recharge surface water bodies. This, in turn, could reduce the total volume of water in nearby lakes or rivers and potentially increase the concentration of contaminants in those water bodies, thereby resulting in adverse effects on water quality. However, there are no natural surface waterbodies within the predicted drawdown radius of the project (approximately 2.2 km – EAP Appendix A).

Wildlife and Species at Risk

Activities linked to the construction, operation, and decommissioning of silica sand mines may have adverse effects to terrestrial wildlife resources (wildlife), including migratory birds and non-aquatic species at risk (amphibians, arthropods, birds, lichens, terrestrial mammals, mosses, reptiles, and vascular plants) as listed on the *Species at Risk Act* (SARA), and their habitat. The Vivian Sand Extraction Project will include annual land disturbance and vegetation clearing for up to 24 years within an 8,235 ha ‘life of Project area’. The provincial EAP describes temporary habitat losses, as natural vegetation is anticipated to regenerate to reduce the initial project habitat loss following a lag time estimated by the Proponent to be 5 to 10 years following closure. However, habitat features important to wildlife may be directly and indirectly affected by the Project’s clearing footprint of the planned wellsite arrays, temporary access trails, or slurry and water pipelines. Sensory disturbances (e.g. noise from extraction well drilling, sand extraction, diesel generator operation) and increased risk of wildlife mortality from construction and operation activities are also predicted by the Proponent and planned to occur through each operating year. Species like the Golden-winged Warbler, which inhabits early successional habitat, may be drawn to recently disturbed habitats in portions of active project areas and as a result be exposed to greater sensory disturbance or airborne contaminants during project operations.

Species at Risk

Considering the provincial EAP, species at risk that are expected to interact with the Vivian Sand Extraction Project are similar to those noted for the Vivian Sand Processing Facility Project. The Project is located within ranges of 32 SARA-listed or COSEWIC-assessed wildlife species (21 bird species (of which 18 are Migratory Bird Convention Act (MBCA) listed), 4 mammals, 1 amphibian, 1 reptile, 5 arthropods). The Proponent’s EAP identifies 13 species at risk with potential to occur and interact with the Project including Little Brown Myotis, Northern Myotis, Barn Swallow, Golden-winged Warbler, Red-headed Woodpecker, Eastern Whip-poor-will, Common Nighthawk, Canada Warbler, Olive-sided Flycatcher, Short-eared Owl, Bank Swallow, Eastern Tiger Salamander, and Northern Leopard Frog.

Of the species at risk with potential to interact with the project, ECCC notes that two migratory bird species at risk and two mammal species have greater potential to be affected by the Project’s proposed temporary conversion of habitat, which could affect biophysical attributes important for breeding and foraging habitat. These include Golden-winged Warbler (SARA-listed as Threatened), Red-headed Woodpecker (SARA-listed as Endangered), Little Brown Myotis and Northern Myotis (SARA-listed as Endangered). Specific effects to these species may be anticipated because portions of the Project site are occupied by mature forest and may contain large diameter trees that could support residences of Red-headed Woodpecker and provide maternal roosts of Little Brown Myotis. Within the Project Site, 289 ha is forested predominantly by hardwoods and trembling aspen, including 123 ha of mature forest as well as young and immature age classes. Within the 24-year Project area, 4561 ha is forested predominantly by hardwoods and trembling aspen, including young and immature age classes as well as 1,965 ha mature forest. Forest and open/shrub/edge habitat patches providing suitable habitat for Golden-winged Warbler are also anticipated given species occupancy observations in the area (eBird, 2021).

No species-specific information is provided in the EAP regarding species-specific effect avoidance, mitigation, or monitoring. In consideration of information available in published recovery strategy documents, effects to these habitat features should be evaluated and avoided in specific planning.

Critical Habitat

The Vivian Sand Extraction Project overlaps with areas containing critical habitat protected under the SARA for two migratory bird species at risk: Red-headed Woodpecker and Golden-winged Warbler. The Project is located within one of Manitoba’s 10X10 km Standardized UTM grid squares containing critical

habitat for Golden-winged Warbler in one of Manitoba's focal areas "GL3", as identified in the published Recovery Strategy for the Golden-winged Warbler (*Vermivora chrysoptera*) in Canada (Environment and Climate Change Canada, 2016). This focal area has a critical habitat threshold of 72,200 ha (the target sum of nesting and foraging habitat patches residing within an appropriate forest landscape, as per the Recovery Strategy definition for critical habitat). Proposed Project activities like clearing of vegetation may result in permanent habitat loss or conversion of habitat, temporary habitat loss, or habitat degradation and these activities have the potential to destroy critical habitat. Current levels of suitable habitat within GL3 relative to the critical habitat threshold are unclear and provincial regulatory mechanisms for the identification and protection of critical habitat have not been described or confirmed. ECCC advises that consideration is required for whether the predicted project effects to this habitat within the identified critical habitat square will result in effects to critical habitat for Golden-winged Warbler.

The Project area also includes identified critical habitat for Red-headed Woodpecker. The Project is located within one of Manitoba's 10X10 km Standardized UTM grid squares containing critical habitat for Red-headed Woodpecker and critical habitat polygons are located within the larger Project Site described for the 24-year operating life of the Project, in an area southwest of the 2021-2025 proposed operation area based on observations of individuals. The Project may include activities of the type that may destroy critical habitat for Red-headed Woodpecker, as described in the Recovery Strategy (Environment and Climate Change Canada, 2021), for example, removal of a treed area; removal of decadent deciduous trees (i.e. trees with cavities, dead/dying trees, and trees with dead or dying limbs 13 cm in diameter or larger) and other standing trees with an 18 cm diameter at breast height (dbh) or greater; clearing or destruction of understory vegetation or other non-built up areas; construction of built structures (including houses/ buildings, roads, and wind turbines); establishment of aggregate pits, quarries and mines; removal or destruction of fruit-bearing trees/bushes, or removal of coarse woody debris. ECCC advises that consideration is required for whether the predicted project effects to habitat will result in effects to critical habitat for Red-headed Woodpecker.

The Proponent includes a commitment to undertake vegetation clearing outside of the breeding bird season, where feasible, and an annual Revegetation Monitoring Program is proposed, but specific habitat requirements of SAR are not detailed in proponent mitigation measures presented in the provincial EAP, nor are Proponent commitments made to incorporate species-specific habitat requirements in revegetation and closure planning.

Environmental Emergencies:

The proposed Silica Sand Extraction Facility Project includes extraction well drill rigs, temporary drill rig access trails, slurry lines, water return lines, dewatering and pumping stations, propane and diesel storage tanks; and a small mobile office unit. There is potential for adverse environmental effects from the Project due to:

- Accidents and malfunctions, such as spills of diesel fuel, lubricants, oils and hydraulic fluids;
- Fire and explosions from hazardous materials; and,
- Transportation accidents that can result in a release of contaminants and flammable materials.
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Adverse effects to water quality, wildlife and wildlife habitat could result from the accidental release of hydrocarbons and other contaminants to surrounding water. Optimized spill prevention, preparedness and response measures and systems will be important given the risk of releasing hazardous substances to the environment, especially to nearby waterways and environmentally sensitive areas.

Upon request by the Impact Assessment Agency of Canada, Environment and Climate Change Canada will evaluate if the Project includes measures to prevent and address environmental emergencies, and that these measures meet the requirements for spill prevention, notification and mitigation found in the Canadian Environmental Protection Act, 1999, the Migratory Birds Convention Act, 1994 and the pollution prevention provisions of the Fisheries Act. The feedback that ECCC will provide to proponents will also be based on any hazard assessment analyses (physical, environmental, and human health and life) if available, whenever relevant to Projects.

Legislative or Regulatory Mechanisms Administered by ECCC:

With regards to whether any of the effects identified above may be managed through legislative or regulatory mechanisms administered by ECCC, or if a license, permit, authorization or approval may be issued, and include conditions in relation to those effects, please reference Questions 2 and 7 of ECCC's FAAR Response dated September 14, 2020. ECCC will require detailed information on the potential effects of the projects, including locations and/or occurrences of species at risk, their use of habitat and critical habitat within the project areas, and specific effects on federal land, before ECCC can determine whether a SARA permit is required. CWS has not been contacted by CanWhite Sands Corp. regarding permitting requirements. -

2. 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 Projects? In particular, the following issues have been raised by the requestors:
- a. Impacts due to groundwater withdrawal quantity
 - b. Impacts on water quality through releases or accidents
 - c. Impacts on soil quality
 - d. Contamination of fish bearing waters
 - e. Impacts on air quality and atmospheric environment, including noise and light pollution
 - f. Impacts to human health and socioeconomic conditions

If yes, please specify the program or authority.

ECCC previously identified programs or authorities that may be applicable to addressing the concerns expressed about the Project in our September 14, 2020 FAAR response for the Vivian Sand Processing Facility and Vivian Sand Extraction Facility. Since then, the Government of Canada published a revised version of the Strategic Assessment of Climate Change (SACC) in October 2020.

The SACC 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 will be required; and the circumstances in which a credible plan for achieving net-zero GHG emissions by 2050 will be required.

More detail is provided in the draft Technical Guide Related to the SACC: Guidance on quantification of net GHG emissions, impact on carbon sinks, mitigation measures, net-zero plan and upstream GHG assessment, published in August 2021. Further information can be found in the SACC <https://www.strategicassessmentclimatechange.ca/>.

Margaret Fairbairn

Name of departmental / agency
responder

A/ Regional Director, Environmental
Protection Operations

Title of responder

September 10, 2021

Date