



Environment and Climate Change

Environmental Approvals Branch
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File No.: 6275.00

March 10, 2026

Jack Winram
Chief Development Officer
Sio Silica Corporation
201 Portage Avenue, 18th Floor
Winnipeg MB R3B 3K6
jwinram@siosilica.com

Dear Jack Winram:

Re: Sio Silica Corporation - SiMBA Sand Extraction Project – Additional Information Request

The Environmental Approvals Branch has reviewed the comments received from the Technical Advisory Committee and the public respecting the SiMBA Sand Extraction Project. Enclosed are two summary memoranda: one outlining the Technical Advisory Committee's comments, including those requiring a response, and one summarizing the public comments to be addressed.

The requested additional information must be submitted no later than September 30, 2026.

If you have any questions on this matter, please contact Eshetu Beshada, Senior Environmental Engineer, Environmental Approvals Branch, at Eshetu.Beshada@gov.mb.ca.

Sincerely,

Eshetu Beshada
Senior Environmental Engineer
Project Coordinator

c. Marlene Gifford AECOM Canada Ltd marlene.gifford@aecom.com

DATE: March 06, 2026

TO: Jack Winram,
Chief Development Officer
jwinram@siosilica.com

FROM: Eshetu Beshada, P. Eng.
Senior Environmental Engineer
Industrial and Wastewater Section

SUBJECT: File 6275.00 - Sio Silica Corporation - SiMbA Sand Extraction Project – Additional Information Request

We have reviewed the comments received from the technical advisory committee. Information summarized below under Section 1 is provided for your information and action. Section 2 includes the request for additional information required to address the technical comments. The full technical advisory committee comments are located on the public registry at the following link:

<https://www.manitoba.ca/sd/eal/registries/6275/index.html>. A separate information request will be provided related to the public comments.

1. The following comments are for your information and action:

- 1.1. A Water Rights Licence for “other-mining” purposes to capture well drilling and groundwater extraction activities as described in the proposal is required.
- 1.2. A Heritage Resource Protection Plan (HRPP) is required for planning, development, and operations, in the event heritage resources are accidentally encountered. If any changes to the plans are needed, you are required to contact the Heritage Resource Branch for re-evaluation.
- 1.3. If at any time, heritage resources are encountered during testing and development, you must report any of them and are prohibited from destruction, damage or alteration of said resources.
- 1.4. If construction activities require the need to construct new access, modify existing access, intensify the use of or relocate an existing access connection onto a Provincial Road, a permit will be required from Manitoba Transportation and Infrastructure.
- 1.5. A permit may be required for any construction within a control area or circle of a Provincial Road. Information regarding control areas and circles can be found at https://www.gov.mb.ca/mti/hpd/pdf/controlled_area_map.pdf
- 1.6. A permit may be required to discharge water or other liquid materials into the ditches of a Provincial Road. Permit applications and information can be obtained at the following link: <https://www.gov.mb.ca/mti/hpd/permits.html>.
- 1.7. The development has an approved permit issued on May 8, 2024, for the public road connection onto PR 302 that expires May 8, 2026. If the work has not been

completed, the permit will need to be extended before it expires. For permit information, please email accessmgmt@gov.mb.ca or call 204-583-2433.

- 1.8. The cost of a Traffic Impact Study and any required on-highway improvements would be the responsibility of the developer (the applicant will have to enter into an agreement with the department for the construction of the on-highway improvements). For more information regarding this agreement please email trafficimpactstudies@gov.mb.ca or call 204-583-2433.
- 1.9. The following statutory requirements must be complied with for PR 302 under The Transportation Infrastructure Act:
 - i. a permit is required to construct, modify, relocate, remove or intensify the use of an access. A permit is also required to construct, modify or relocate a structure or sign, or to change or intensify the use of an existing structure (including the alteration of existing buildings) within the 38.1 (125ft) controlled area from the edge of the highway right-of-way.
 - ii. a permit is required for any planting placed within 15 m (50 ft) from the edge of the highway right-of-way.

2. Provide additional detailed information or clarification for the following:

- 2.1. Manitoba Transportation and Infrastructure - Roadside Development provided the following comment regarding traffic study:
 - i. Provide written confirmation from Manitoba Transportation and Infrastructure that an amended/updated Traffic Impact study is approved. The study shall
 - a) be prepared by a qualified transportation engineer.
 - b) identify the amount and type of traffic that will be generated by the development and its potential impact on the adjacent road network.
 - c) identify the type of on-highway improvements that will be required to safely accommodate the traffic generated by the development.
- 2.2. The Office of Drinking Water requires the following additional technical information to provide a comprehensive assessment of the projects with respect to any impact to drinking water.
 - i. Clarify how the proposed water treatment process is designed to produce treated water meeting drinking water (potable) standards or environmental standards.
 - ii. Provide a preliminary engineered design of the proposed water treatment process.
 - iii. Provide a detailed drawing or schematic showing the water treatment process for each treatment step in sequence, including pumps, each filtration step (e.g., 5-micron, 1-micron absolute), and the UV disinfection system. The details should include:
 - a) the quantity of treatment units and its arrangement (e.g., in-series or in-parallel)
 - b) any duty/standby and bypass configurations
 - c) the location and type of valves and sampling taps

- iv. Provide the design details for the UV disinfection system including certifications (e.g., NSF 55A or US EPA UVDGM (dose-validated) standard and if there is an associated flow restrictor to ensure validated dose control). Provide the manufacturer/ make/ model number of the UV units.
- v. What is the proposed log (inactivation) value (e.g., 3 or 4 log) for the UV disinfection system?
- vi. Provide the following technical details of the expected operating conditions (low to high range values) of the influent water for the UV disinfection system.
 - a. flow rate and water quality parameters such as UV Transmittance (UVT) in percentage (%),
 - b. hardness, and iron levels.
 - c. turbidity,
 - d. suspended solids,
 - e. colour, tannins, and manganese levels.
- vii. Provide the expected effluent water quality from the water treatment process.
- viii. Provide the technical industry standards and certifications, with potable water standards (NSF, FDA, CSA, AWWA, etc.) clearly noted for all water treatment equipment including piping and valves. The manufacturer specification sheets shall be included.
- ix. Provide the Process Control Narrative (PCN) technical document that describes
 - a. how the water treatment process operates under various conditions including if the UV disinfection system is in alarm status or not operating within validated conditions.
 - b. under what conditions the water treatment process and/or production is paused or stopped.

2.3. The Forestry and Peatlands Branch requests clarification on the following:

- i. What replaces sand in filtering/water holding capacity once the sand is removed from the ground?
- ii. What is the impact to forest and peatland resources due to sand removal and re-introduction of water?
- iii. What is the impact to the surface due to the extraction of 500,000 tonnes of silica per year?
- iv. What is the project impact on aggregate withdrawals in the area?
- v. If water head and supply have decreased over the past 100 years, how will this project improve or maintain current water supply and quality?
- vi. Forestry climate change models show drying environment so public use of water may require deep well drills to provide access to potable water. Taking this scenario into consideration, provide how the project impacts ground water and then forest sustainability.
- vii. How will the removal of the aggregate impact future water supplies for a growing population?
- viii. Provide how the cumulative impacts of this project will be assessed and addressed.

- 2.4. The Drainage and Water Rights Licencing Branch – Drainage Section, requests the following additional information:
- i. Describe any proposed water control works and the potential impact to designated wetlands under the Water Rights Act.
 - ii. Provide a map showing the specific location of the proposed wells that would help to assess whether the well site is in, on or close to a designated wetland.
 - iii. Provide an inventory of assessed wetlands within the project area to determine if the proposed project will have an impact on designated wetlands.
 - iv. Provide a mitigation plan to avoid impacting designated wetlands.
 - v. Describe any new access crossings required that would include culverts.
 - vi. Provide more information regarding the potential impact to surface hydrology.
- 2.5. The Parks Branch indicated that Lewis Bog Ecological Reserve, Brokenhead River Ecological Reserve, Ste. Anne Bog Ecological Reserve, and the Cedar Bog Ecological Reserve are the nearest sites to the proposed project. Provide more detailed information with respect to the following:
- i. These sites may rely on groundwater to support rare species. Is there any impact of aquifer disturbance to adversely affect habitat?
 - ii. Will the project impact on the moisture level and water chemistry in the ecological reserves, even if temporary or minimal? Describe proposed mitigations to prevent adverse impacts on the ecological reserves.
- 2.6. Provide additional information to address the following concerns and comments raised by Wildlife Branch:
- i. How will Sio Silica Corporation identify areas where protected birds may occur, including their nests, breeding and foraging habitat? Federally identified Critical Habitat for both the Golden-winged Warbler and the Red-headed Woodpecker overlap the Regional and Local Project Areas. How will all vegetation clearing and rehabilitation/ revegetation plans take into account the habitat and vegetation structural needs of these legally protected birds?
 - ii. In section 7.7. Revegetation Monitoring Program, you stated that the “Golden-winged Warbler is a Species at Risk that may occur in the Regional Project Area.” In Table 5 of Part 2 of the EAP, it is suggested that the Golden-winged warbler has a low to moderate probability of occurrence. However, in addition to federally identified Critical Habitat there are multiple records of known occurrences of both the Golden-winged Warbler and the Red-headed Woodpecker within the Local and the Regional Project Area. Other legally protected birds with known occurrences within the regional or local areas also include Eastern Wood-Pewee (Special Concern- SARA), Bobolink (Threatened, SARA), Eastern Whip-poor-will (Threatened- ESEA, SARA). Provide assessment of the project’s impact for those other birds described in this section.

- iii. According to the proposal, 50% of the project area is under natural/perennial vegetation cover, much of which is forested habitat. Have any vegetation surveys been done to determine whether any plant species of conservation concern (including Species at risk and provincially tracked [S1 to S3] species) occur in the project footprint?
- iv. Describe methods proposed to be used to clear woody vegetation and woody debris without impeding wildlife movements or vegetation regeneration.
- v. The access roads throughout the project area have the potential to facilitate weed transmission while areas of disturbed ground cover that result in bare soil increase the likelihood of colonization by exotic and invasive species. Provide a survey of potentially available invasive species and a plan to address and mitigate their potential spread related to the project activities.
- vi. The proposal states that disturbed areas will revegetate naturally and the need for augmented revegetation will be assessed.
 - a. How will you determine whether there is a need for augmented revegetation using native seeding and native plantings?
 - b. Will re-seeding and replanting be monitored for success?
 - c. Will you use native species for revegetation?
 - d. What is the list of species to be used for revegetation?
- vii. Describe the method for access trails decommissioning. What is the revegetation protocol for areas that may be compacted by heavy machinery access or other use, such as transport lines for the sand slurry?
- viii. Clarify how other aggregate withdrawals or other regional development projects may interact with the activities of this project.

2.7. Provide clarification or additional information for comments provided by the Mining branch:

- i. Provide an assessment considering the overall impact of the project in its entirety instead of assessing multiple smaller components.
- ii. In Appendix A Sio Silica addressed CEC Recommendations #2(1), by proposing one or two holes in some clusters. The layout for clusters with spacing and dimensions should be shown on a diagram as in Fig 2-3 (page 44) of the EAP.
- iii. Sio Silica should complete the layout and update Figure 2-1 (Page 6 of app_b_part_2- Figure 1-25) with clarification of whether the colour coded 'dots' represent holes or clusters of holes.
- iv. Recalculate the extraction ratio based on the production quantity expressed as a percentage of the available resources in the project area. The ground instability potential or ground subsidence potential is directly related to % extraction. Please elaborate in detail the impact based on this information.
- v. The two technical reports (Stantec 2019. Technical Report DEN Property Manitoba, Canada; and Stantec 2019 and Technical Report BRU Property Manitoba, Canada) states that *"This Technical Report does not include an estimate of reserves. The available exploration data is not sufficient to support the preparation of a Pre-Feasibility Study; therefore, in accordance with the requirements of NI 43-101, the reported resources cannot be*

classified as reserves". Provide detailed clarification regarding this comment. The two reports together (tables 14.2 of the reports) indicate that the total estimated resource is 531 Mt (531,000,000 t). So, the % extraction based on the proposed 5-year extraction and the total reported resource within the DEN and BRU combined is 0.36% and not 0.0125% as claimed in the EAP.

- a. Provide a reference to how the mine life estimate of 25 years was estimated.
 - b. Provide a reference for 15,252,000,000 tonnes used to project the 25 years mine life.
- vi. As there is no reserve estimate, a 25-year mine life projection is not reasonable. Submit a revised Mine life estimated based on the following formula:
- $$\text{Mine Life (years)} = \frac{\text{Total Mineable Ore Reserves (tonnes)}}{\text{Annual Ore Production Rate (tonnes/year)}}$$
- vii. The design and layout of holes is based on the findings and recommendations of the Stantec 2022 report. The strength parameters used for geotechnical analysis is based on data collected from 9 holes and only one of them BH 10-17 is located within the 25-year project area and not within the 5-year currently proposed area. Provide clarification how this design assumptions provide a realistic analysis.
- viii. Describe clearly and comprehensively all proposed testing and monitoring activities, including an implementation schedule as indicated in the Stantec (2002), Arcadis (2022), and CEC (2023) reports. These should include:
- a. Angled bore-hole testing to verify presence of vertical fractures
 - b. Acoustic Televiewer/Optical Televiewer (ATV/OTV) surveys
 - c. Coring to confirm overburden, and competent caprock thickness
 - d. Side scan sonar to confirm cavity development and long-term cavity shape

2.8. The Water Science Watershed Management, Groundwater Management Section provided the following key technical issues affecting groundwater risk and model reliability. The section requests that several foundational items in the hydrogeological appendices must be corrected or completed before further assessment.

- i. Provide clarification on data gaps that remain related to geochemistry, co-mingling of separate and distinct aquifers, timely laboratory analyses reporting in addition to the in-situ data reporting, reliance on treated well samples and missing return water quality data.
- ii. Data and Inventories submission leans on GIN records (many pre-2007).
 - a. Revise the information using the provincial well database -GWDRILL as the primary source for well counts, locations, aquifer assignments, and pumping.
 - b. Conduct your own well inventory survey in the area.

- c. Update the 3D Model, for demand totals, and for the verification of all project wells in GWDRILL.
- iii. Recharge zones were assigned based on surficial geology but Figure 6-1 likely overstates the extent of the “coarse/high-recharge” areas within the Sandilands region. Match the recharge zones to provincial maps, demonstrate area correlations before and after, and re-run the steady-state water balance.
- iv. Provide layer-specific boundary maps, justify any deep no-flow zones, or switch to general-head/specified-head tied to the provincial wells, and report perimeter fluxes. Additionally, ensure well boundaries are reconciled with up-to-date licensed-use loads from Groundwater Use Licensing to reflect realistic external stresses.
- v. The steady-state calibration utilized GIN snapshots and was conducted at a regional level, while the transient calibration is based on one local 72-hour pumping test—resulting in spatial and temporal mismatches between the calibration scales. An approximately +3 m bias indicates heads run high. Provide the following:
 - a. calibration/validation to multi-year provincial records,
 - b. a domain-wide transient check,
 - c. report metrics for that network, and
 - d. adjusted recharge/boundaries/properties where needed.
 - e. utilize additional pump test data and revisit the slug-test methods to better represent aquifer heterogeneity.
- vi. Provide decision output counts of domestic/licensed wells within 0.5 m and 1.0 m drawdown by
 - a. year and aquifer (with/without reinjection),
 - b. drawdown/recovery time series at potentially impacted wells, and
 - c. vertical head differences across the Winnipeg Shale.
- vii. Provide a commitment of annual outreach prior to operation that includes,
 - a. a 48 to 72-hour response time limit for pump-lowering/backup supply,
 - b. public reporting,
 - c. clarify priming volume,
 - d. loop water balance, and
 - e. metering of the approximately 15% water content to be retained,
- viii. Confirm the governing acts for drilling, reinjection, and abandonment. Well sealing must comply with the Well Standards Regulation (tremie-placed bentonite/cement; no shale backfills); any competent drill-cuttings used should be only above grouted intervals and in compliance with regulations.
- ix. Winnipeg Shale continuity/condition is incorrectly based on assumed homogeneity. Incorporate weathered zones, fractures, and legacy cross-connecting wells (from GWDRILL) into the conceptual model and

sensitivity analyses. The stratigraphic surfaces and figures should be updated with current data.

- x. Submit completed plans specifying monitoring locations, parameters, frequencies, thresholds, and triggers for operations, closure, and post-closure. Extend post-closure monitoring beyond five years as trends warrant. As per CEC recommendations, worst-case scenarios need to be evaluated.

DATE: March 06, 2026

TO: Jack Winram,
Chief Development Officer
jwinram@siosilica.com

FROM: Eshetu Beshada, P. Eng.
Senior Environmental Engineer
Industrial and Wastewater Section

**SUBJECT: File 6275.00 - Sio Silica Corporation - SiMbA Sand Extraction Project
– Additional Information Request for Public Comments**

Environmental Approvals Branch received over 2170 public comments in response to the Sio Silica Corporation proposed SiMbA Project. We have carefully reviewed all of the comments submitted during the proposal review period. The following summary groups the comments provided by members of the public into several topic areas. The complete comments are located on the public registry at the following link. <https://www.manitoba.ca/sd/eal/registries/6275/index.html>. A separate information request will be provided related to the Technical Advisory Committee (TAC) comments.

You are required to provide detailed additional information to address the comments as noted below. Please use plain language and/or graphics and avoid or clearly explain technical terms.

1. New unproven extraction method

- There are no technical alternatives investigated to the proposed extraction process provided.
- The proposed extraction method does not have enough history to properly examine the full extent of its impact on the surrounding environment and communities.
- The proposed extraction method is unproven, and its impact is not known.
- The long-term impact of the project on the groundwater/aquifer and geological stability is not clear.
- The proposal shows unresolved uncertainties and lacks regional cumulative analysis

2. Aquifer contamination, aquifer mixing & loss of hydraulic isolation

- Drilling and air-lift extraction could connect the discrete Winnipeg Sandstone and the Red River Carbonate aquifers by degrading the Winnipeg Shale aquitard and by the abandonment of a very large number of wells that creates long-term preferential pathways for contaminants
- Violate the statutory prohibitions on interconnection in Manitoba well standards/drilling regs.
- lowering groundwater table potentially impacting drinking water well yield/quantity for residents in the area.
- Potential mixing of the two aquifers leads to cross contamination between them and loss of clean water from the drinking water aquifer.
- Baseline testing for nearby private wells is missing.
- There is no clear remediation plan proposed if groundwater/aquifer contamination happens.
- The proposed remediation program indicates that the water returned into the aquifer will be filtered, but does not detail the process for filtration, or particle sizes that can be captured in the filtration.

3. Geochemical risk due to Oxygen introduction & redox shifts

- Airlift extraction and reinjection of oxygenated groundwater extracted with sand back into the aquifer could oxidize the aquifer minerals, mobilizing Se, As, U, Fe/Mn; change in groundwater pH, and enable aerobic bacteria growth (biofouling)
- 1-D contaminant modeling omits multi-cluster interactions, plume behavior, and longer timeframes; underestimated selenium dissolution vs. shake-flask evidence.
- PorousTec flagged inadequate sampling (e.g., nine samples, no duplicates; grab samples from stockpiles; long storage times), undermining geochemical conclusions.
- With collapse of the Winnipeg shale aquitard, the oxygen and contaminants can potentially move into the overlying Carbonate Aquifer.

4. Geomechanical stability, voids & risk of surface collapse

- Removing sand below confining units creating water-filled cavities may undermine the shale and overlying units creating voids and collapse could occur, leading to sinkholes. This is a crucial risk with insufficient evidence ruling out widespread collapse.
 - The model calibrated to site cores & televiewer logs should define maximum sand volume per cluster and minimum pillar spacing.
- Provide surface deformation monitoring (InSAR + GPS) with TARP thresholds such as cumulative settlement >X mm/month to pause & review the extraction process.
- Provide detailed televiewer/sonar, deformation monitoring and an early-warning with stop-work protocol.
- concerns about the geotechnical analysis completed since most of the subsurface reference information used for the analysis is missing. Only 6 test hole logs are provided in Appendix B of those test hole logs only one provides detailed geological logging information of the bedrock core.
- Concern about density change when voids are filled by water alone instead of sand and water and impacts on aquifer integrity.

5. Groundwater modeling limitations & underestimation risk

- limited site characterization, questionable recharge values, calibration bias, and underestimation of drawdown beyond 300 m; coupled aquifer dynamics and shale leakage not robustly handled.
- The X1t model is 1Dimensional and did not consider how the contaminated plume interacts with other mined cavities or how ongoing mining that increases gradients and flow, impacts movement.
- The models should be updated with corrected recharge, anisotropy, and multi-cluster scenarios, sensitivity to shale degradation, and validation against extended pumping tests.

6. Well abandonment integrity & long-term pathway risk

- Hundreds of wells per year are proposed for abandonment; the use of drill cuttings/ overs for sealing is considered unsafe with a risk of perpetual pathways.

- Continuous abandonment to surface with bentonite grout and independent QA/QC proposed with seal verification.
- Poorly constructed/abandoned wells can act as conduits between aquifers, accelerating mixing, therefore, provide how post-closure inventory and audit of all decommissioned project wells per CSA/Manitoba standards are verified.

7. Waste stream characterization & management

- the waste streams such as calcified sand, interbedded shale, oolite, marcasite; PorousTec criticized sampling QA/QC.
- Full Waste Characterization & Management Plan including potential acid-generating shale with chain-of-custody and restrictions on reuse.
- Proposed method to handle potential spill and pipeline leaks during slurry transportation to the processing facility.

8. Community well impacts such as brown water, turbidity, taste/smell

- Observed discolouration (“brown water”), iron/manganese precipitates, Sulphur odour, and complaints linked to oxidizing conditions during operations.
- Provision for any baseline sampling, complaint protocols and automatic mitigation triggers.
- In the event ground water is contaminated and a test confirms, how will residents be notified? How will they be provided with clean potable water?
- Removing silica sand from the aquifer reduces the natural water filtering capacity of the aquifer.
- Proposed minimum setback distance of extraction wells from neighboring water well and predrilling background water test.
- Sand extraction and reinjection of water could depressurize aquifer, alter well yields, and increase turbidity from mobilized fines

9. Radon risk from uranium pathways

- concerns due to uranium mobilization that can potentially elevate radon in homes.
- Provide radon risk potential to neighboring homeowners and proposed mitigation program if thresholds exceeded.

10. Climate sensitivity & aquifer as strategic resource

- Deep, isolated aquifers are crucial under changing climate; references to past CEC advice on integrated watershed plans not yet fulfilled.
- incomplete climate sensitivity analysis such as recharge/water balance measurements
- Scenario analysis (multi-decadal droughts/heat); recharge estimates under climate change; adaptive operating rules when recharge index \leq threshold.

11. Noise/light, Air Quality & wildlife/ecology impacts

- Year-round operations near homes/barns; concerns for animals with greater hearing sensitivity and nocturnal species; lack of measured baselines.
- Impact air quality from dust and silica sand, surface erosion, and traffic.
- Sand mining, processing, and transport operations will occur 24/7, up to 100 meters from homes.
 - The potential for air quality impacts has not been adequately assessed.
 - The assessment of noise and artificial light pollution has been ignored.
- Concerns about habitat loss, fauna displacement, and impacts on wetlands/forests that support well-being.