

THE MANITOBA CLEAN ENVIRONMENT COMMISSION

IN THE MATTER OF the Manitoba Clean Environment Commission Technical Review and Public Hearing regarding the proposed Vivian Silica Sand Extraction Project;

AND IN THE MATTER OF written final argument submitted by Sio Silica Corporation.

SIO SILICA CORPORATION

WRITTEN FINAL ARGUMENT

March 24, 2023

To: Secretary
Manitoba Clean Environment Commission
305-155 Carlton Street
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I. OVERVIEW

1. On August 3, 2021, Sio Silica Corporation (“Sio Silica”) filed an Environment Act Proposal (“EAP”) for its proposed Vivian Silica Sand Extraction Project (the “Project”) with Manitoba Environment and Climate (the “Department”).¹ The Project EAP contained the information described in the Department’s *Information Bulletin – Environment Act Proposal Report Guidelines*² (the “EAP Guidelines”). On November 15, 2021, the Minister of Environment and Climate (the “Minister”) requested that the Clean Environment Commission (the “Commission”) conduct a technical review and public hearing (the “Hearing”) to consider the potential environmental and human health effects of the Project, in accordance with a terms of reference provided by the Minister (the “Terms of Reference”).³
2. The primary issues during this proceeding are relatively narrow. Issues related to environmental and socio-economic components like air quality, wildlife, fish, vegetation, and Indigenous rights were either not raised, or not raised to any significant extent. Instead, the Hearing focused on (1) geotechnical matters, (2) groundwater quantity and quality, (3) waste management, and (4) cumulative effects, all of which are highly technical and specialized issues for which the Commission should rely on expert evidence.
3. Sio Silica provided extensive evidence from qualified experts on the primary issues, which demonstrates that the environmental and human health effects of the Project will be minimal. By contrast, other parties provided opinions from individuals who are either not experts at all, not experts for issues they opined on, or whose evidence either supports Sio Silica’s evidence or should otherwise be given less weight (e.g., because it was not tested or the individual lacks relevant industry experience). These individuals do not rebut the conclusions of the large number of experts retained by Sio Silica and who reviewed the experts reports filed in support of the Project EAP, whose conclusions support an ultimate conclusion that Project will not result in any material environmental or human health effects.
4. Accordingly, and for the reasons below, the Commission should advise the Minister that the Project will not likely result in any material adverse environmental or human health effects, and recommend that an Environment Act licence (“EAL”) be issued for the Project.

¹ At the time the Project EAP was filed and the Terms of Reference were issued, Sio Silica was named CanWhite Sands Corp. and the Department was named Manitoba Conservation and Climate.

² At the time the Project EAP was filed, the most current EAP Guidelines were the version published in March 2018, which is available online: https://www.gov.mb.ca/sd/pubs/environmentalapprovals/eap_report_guidelines_march_2018.pdf [“EAP Guidelines”].

³ At the time the Terms of Reference were issued, the Minister was known as the Minister of Conservation and Climate.

II. SCOPE OF WRITTEN FINAL ARGUMENT

5. This Written Final Argument of Sio Silica is intended to encompass the oral and reply argument that was presented on its behalf during the Hearing on March 15, 2023, while also providing evidentiary references and legal authorities to support those arguments.
6. It also responds to the written legal argument filed by the Manitoba Eco-Network and Our Line in the Sand (collectively, “MBEN/OLS”) on March 15, 2023, the additional closing remarks filed by the Rural Municipality of Springfield (“RMSF”) on March 15, 2023, and to the written submission filed by the Municipal Silica Sand Advisory Committee (“MSSAC”) on March 22, 2023. However, Sio Silica notes that (1) most of MSSAC’s written submission repeats what was submitted during their oral argument on March 15, 2023, which Sio Silica already responded to during its oral reply argument that day, and (2) most of MBEN/OLS’ written legal argument consists of arguments which were similarly covered during Sio Silica’s oral reply argument on March 15, 2023. Accordingly, this Written Final Argument only addresses new points in MSSAC’s written submission and MBEN/OLS’ written legal argument that have not already been responded to, or for which Sio Silica’s response requires elaboration in writing.⁴

III. CONTEXT FOR RECOMMENDATIONS TO BE MADE BY THE COMMISSION

A. Requirements for the Project EAP

7. The Project is a Class 2 development, which requires the filing of an EAP in the prescribed form,⁵ and that includes matters required by the regulations under *The Environment Act*.⁶
8. The Department has published the EAP Guidelines, which set out the information that must be included in an EAP, based on the regulations under *The Environment Act*.⁷
9. As noted above, Sio Silica filed its EAP for the Project in July 2021. During the Hearing, nobody suggested that the EAP and supporting reports filed by Sio Silica do not meet the requirements set out in the EAP Guidelines. It is uncontroverted that they do meet the EAP Guidelines and, in fact, exceed them in several respects. For example, Sio Silica’s EAP was supported by numerical hydrogeological modelling, which is not required in the EAP Guidelines and is something other recently filed EAPs have not included – including several EAPs that proposed to withdraw significantly more water from the same general

⁴ This Written Final Argument uses the term “final arguments” to encompass a participant’s oral and written legal arguments, collectively, in cases where similar submissions were made in both.

⁵ The prescribed EAP form is available online: https://www.gov.mb.ca/sd/pubs/environmental-approvals/eap_form.pdf [“EAP Form”].

⁶ CCSM c E125 [“*The Environment Act*”], ss. 11(1), 11(7).

⁷ See the EAP Form at PDF 2, which clearly indicates that the information set out the EAP Guidelines is required as part of an EAP. See also: (1) the EAP Guidelines, which clearly indicate that they are based on the *Licensing Procedures Regulation*, Man Reg 163/88 – the regulation under *The Environment Act* that sets out the matters required to be included in an EAP for a Class 2 development, as contemplated in s. 11(7) of that Act; and (2) the *Licensing Procedures Regulation*, which requires substantially the same matters to be included in an EAP for a Class 2 development as the EAP Guidelines.

area as the Project and were subsequently approved by the Government of Manitoba (“Government”).

10. It bears noting that when a company like Sio Silica prepares and files an EAP for a proposed development, it does not know whether the Commission will ultimately be asked to conduct a public hearing regarding its EAP. Under *The Environment Act*, the Minister has discretion as to whether to request a public hearing on an EAP for a Class 2 development and may only do so if recommended by the Director.⁸
11. Accordingly, Sio Silica’s EAP for the Project should be assessed based on the EAP Guidelines and the level of information that the Government has required for similar EAPs. It would be unfair to judge Sio Silica to a higher standard and hold that it should have conducted more extensive studies in support of its EAP, which was submitted two years ago, only because it was subsequently referred to the Commission for a public hearing. As stated by one of the Commission’s technical advisors, Mr. Wiatzka from Arcadis: “[...] you can’t fault someone for doing just what’s required. That’s okay.”⁹
12. In their oral argument, MBEN/OLS asserted that a project proponent is required to go beyond the EAP Guidelines, think about the purpose of the legislative regime, and consider things like cumulative effects (which are discussed in more detail below).¹⁰ However, it is not reasonable to expect every proponent to think about the intent of the legislative regime and how a lawyer might interpret it in the context of their project. Instead, parties need to know what is required of them when they are preparing an EAP. Other parties – like the Commission and participants in a public hearing – also need to know what is required for an EAP. If every EAP is evaluated on an *ad hoc*, project-specific basis, nobody will ever know, with any degree of confidence, what is required. That is contrary to *The Environment Act* and its regulations, which require EAPs to include the information set out in the EAP Guidelines. While guidelines are not generally law, the information set out in the EAP Guidelines is mandated by *The Environment Act* and its regulations and is what must be included in an EAP.

B. The Scope of the Commission’s Review of the Project EAP

13. Under *The Environment Act*, the Commission is required to follow – and the scope of its review of the Project EAP is limited to – the Terms of Reference provided by the Minister.¹¹

⁸ *The Environment Act*, ss. 11(10), 11(10.1).

⁹ Hearing Transcript for March 6, 2023, as sent to the Hearing Contact List on March 22, 2023 [“Transcript, March 6”], at PDF 85.

¹⁰ Hearing Transcript for March 15, 2023, as sent to the Hearing Contact List on March 22, 2023 [“Transcript, March 15”], at PDF 73-74.

¹¹ *The Environment Act*, ss. 6(5), 6(5.1).

14. Under those Terms of Reference, the Commission can only “provide advice and recommendations to the Minister regarding potential environmental and health effects” of the Project, as defined in Sio Silica’s EAP.¹²
15. While some participants in the Hearing (1) have advocated for changes in regional planning and aquifer management, (2) suggested changes to what is required in the EAP Guidelines, (3) criticized the scope of Sio Silica’s EAP for the Project or (4) made arguments about the effects of activities beyond the scope of the Project, all those matters are beyond the scope of what the Minister has asked the Commission to review, and what the Commission has legal authority to consider as part of its review.
16. Despite what some parties asked, the Commission is legally required to focus on the environmental and health effects of the Project as defined in the EAP when it provides advice and recommendations to the Minister, in accordance with the Terms of Reference.

C. How the Commission should Weigh the Evidence

17. The issues that were the focus of the Hearing – and are most important to the potential environmental and health effects of the Project – are highly technical and specialized issues. The Commission should rely on the experts in each relevant discipline when assessing those potential effects.
18. The Commission should also consider whether someone is actually an expert in a particular discipline relevant to an issue of concern in this proceeding. For example, someone is not an expert in geotechnical engineering or geochemistry simply because they have a degree in geology. Similarly, someone is not an expert in an area simply because they have worked with experts in that area in the past.
19. The Commission should further have regard to the fact that experts retained by Sio Silica put their seal or stamp on technical documents supporting the Project EAP, verifying that they performed their work to a high standard that protects the public and the environment. There are serious consequences if experts like them breach those duties and put their seal or stamp on deficient work. Those duties and consequences do not apply in the same manner to academics, like Dr. Hollander, when they are not taking professional responsibility for technical work. They also do not apply to people who are not qualified as a professional engineer or geoscientist, which is why a person must be registered as one in order to (1) practice those professions or (2) act in a manner that would lead others to believe that they are, in fact, authorized to practice those professions.¹³
20. Unfortunately, during this proceeding there were people who represented themselves as experts in areas that they are not qualified experts in, and who presented opinions as though they are qualified to give expert opinions in certain areas, when they are not.

¹² Letter from the Minister to the Commission providing the Terms of Reference (November 15, 2021), at PDF 3, online: http://www.cecmanitoba.ca/hearings/silica-sand-extraction-project/doc/TermsOfReference/Terms_of_Reference_-_CANWhite.pdf.

¹³ *The Engineering and Geoscientific Professions Act*, CCSM c E120, s. 57.

21. For each issue in the proceeding, the Commission must consider all of the evidence before it and should have regard to who prepared that evidence, including (1) their relevant qualifications and (2) the extent to which they have relevant experience working on other projects or applications of a similar nature. The Commission must also consider whether the information has been subject to testing in the form of cross-examination during the Hearing, or whether it was provided as a written submission or oral presentation that Sio Silica (and other participants) had no opportunity to test, such as the written submission filed by Dr. Eva Pip.
22. All of the above considerations must influence the weight that the Commission assigns to the evidence before it when it considers the recommendations that it will provide to the Minister.
23. Contrary to MBEN/OLS' suggestion during their oral argument, their expert¹⁴ – Mr. Boutin from Matrix Solutions Inc. – was not more credible than Sio Silica's witnesses, whether because he was subjected to the longest cross-examination during the Hearing (as suggested by MBEN/OLS) or for any other reason. The length of the cross-examination of Mr. Boutin was influenced to a large extent by the fact that he often took a very long time to provide clear answers to questions. Further, many of his opinions went beyond his core area of expertise and he has limited to no past experience in Manitoba, unlike witnesses for Sio Silica.
24. Contrary to another suggestion by MBEN/OLS,¹⁵ Sio Silica responded to the comments that Dr. Pip submitted as part of the public review process for the Project EAP, much of which were the same as the comments that Dr. Pip submitted during the Commission's review process.¹⁶ Sio Silica also responded to comments by Mr. LeNeveu during the Hearing, which were based on comments from Dr. Pip. Respectfully, it is misleading to suggest that Sio Silica did not respond to Dr. Pip.

IV. ISSUES THAT WERE THE FOCUS OF THE HEARING

A. Introduction to the Main Issues

25. Typically, when there is a public hearing for a natural resource development project, the project is very large and there is debate about a wide variety of potential environmental and socio-economic issues, from air quality to wildlife, fish, vegetation, and Indigenous rights. In this proceeding, none of those issues were raised to any significant extent. Nor were they raised by the Government's Technical Advisory Committee ("TAC"). While Sio Silica retained a leading environmental consulting firm, AECOM Canada Ltd. ("AECOM"), to assess all potential environmental effects of the Project, the evidence is

¹⁴ Transcript, March 15 at PDF 92-94.

¹⁵ Transcript, March 15 at PDF 118-119.

¹⁶ See "2022-01-14 Proponent Response to Public Comments" located on the public registry: https://www.gov.mb.ca/sd/eal/registries/6119/tab2_responses.pdf.

clear and uncontroverted that the Project will have no material effects on any of those environmental or socio-economic components.

26. Instead, debate during the Hearing was focused on four key issues: (1) geotechnical matters; (2) groundwater quantity and quality; (3) waste management; and (4) cumulative effects. These issues are discussed in turn throughout the rest of this section.

B. Geotechnical Matters

27. Sio Silica retained one of the top geotechnical consulting firms in Canada, Stantec Consulting Ltd. (“Stantec”), to perform a geotechnical assessment in support of the Project EAP. During the Hearing, evidence was given by Dr. Arash Eshraghian and Steve Bundrock, further to the 2022 Geotechnical Analysis Report (the “Stantec Geotechnical Report”) that they prepared in support of the Project EAP. Dr. Eshraghian has a Ph.D. in Geotechnical Engineering and 22 years of experience leading and managing civil and geotechnical engineering projects, including a variety of different types of mining projects. Mr. Bundrock is a Professional Geotechnical Engineer, also with more than 20 years of experience specifically in geotechnical engineering for mines.¹⁷
28. Sio Silica also retained Doug McLachlin to act as a third-party reviewer of Stantec’s geotechnical work for the Project. Mr. McLachlin is AECOM’s geotechnical practice lead for Ontario, and he is a Senior Geotechnical Engineer with more than 38 years of experience, including geotechnical engineering for mining projects.¹⁸
29. Dr. Eshraghian, Mr. Bundrock and Mr. McLachlin are only three of the individuals involved in the geotechnical work for the Project. Between Stantec and AECOM, Sio had a large team of highly specialized experts in rock mechanics and other geotechnical matters who reviewed the Project designs to ensure they are safe and will not cause subsidence on the surface.¹⁹
30. In addition to the above-noted people who are qualified to provide expert opinions about geotechnical matters, the Commission heard from Arcadis, the Commission’s technical advisor for geotechnical matters, during the Hearing. Arcadis’ team included geotechnical experts who reviewed the geotechnical work performed by Sio Silica and Stantec (and reviewed by AECOM), and they verified that the work was performed appropriately and that the Project will not cause surface subsidence.²⁰ Among other things, they agreed with

¹⁷ Stantec, *Sio Silica Corporation – Geotechnical Assessment Summary* (February 27, 2023) at PDF 4, online: http://www.cccmanitoba.ca/hearings/silica-sand-extraction-project/doc/h001_sio_silica_geotechnical_assessment_summary.pdf.

¹⁸ *Ibid.*

¹⁹ *Ibid* at PDF 5.

²⁰ Transcript, March 6 at PDF 16.

Stantec's conclusions about rock mass strength, and they supported Stantec's use of a very conservative factor of safety of 2.0.²¹

31. On the first day of the Hearing, Dr. Eshraghian explained that the factor of safety of 2.0 that Stantec used in its geotechnical work for the Project is higher than the factor of safety used for the design of high consequence dams.²² In other words, the Project has been designed to a higher factor of safety than dams that could eliminate entire communities if they fail. Stantec applied a very conservative standard in this aspect of its geotechnical work for the Project.
32. The Commission also heard some other individuals express opinions about geotechnical matters during the Hearing, including Dr. Hollander, Mr. Boutin, and Mr. LeNeveu, but none of them are geotechnical experts, as they acknowledged during questioning.²³ They are not qualified to provide expert opinions on geotechnical matters. Accordingly, their opinions on geotechnical matters must be given much less weight than the opinions of the experts on such matters.
33. The only other party with geotechnical expertise who provided opinions during the Hearing about geotechnical matters was KGS Group ("KGS"). While KGS has expertise in some geotechnical matters, they acknowledged during questioning that they have very limited expertise in geotechnical matters for mining projects.²⁴
34. During the Hearing, KGS focused its comments about geotechnical matters largely on the potential that the limestone in the Project area could contain continuous vertical fractures that were not detected during Stantec's geotechnical evaluations. But KGS based their assumptions regarding limestone vertical fracturing on observations of surface outcrops elsewhere in Manitoba that they acknowledged are subject to weathering, which causes fractures to occur and to propagate more widely.²⁵ Such weathering conditions are not found in the subsurface in the Project area. KGS also acknowledged that there is variability in limestone fracturing conditions in Manitoba.²⁶ For these reasons, limestone outcrops at surface found elsewhere in Manitoba are not reliable evidence for conditions in the Project area. KGS also suggested, based on sand located elsewhere, that the sand deposit in the Project area may not stand up at angles identified by site-specific investigation and

²¹ *Ibid* at PDF 81.

²² Hearing Transcript for February 27, 2023, as sent to the Hearing Contact List on March 8, 2023 ["Transcript, February 27"], at PDF 81.

²³ Hearing Transcript for March 7, 2023, as sent to the Hearing Contact List on March 22, 2023 ["Transcript, March 7"], at PDF 90; Hearing Transcript for March 8, 2023, as sent to the Hearing Contact List on March 22, 2023 ["Transcript, March 8"], at PDF 134; Hearing Transcript for March 13, 2023 (afternoon), as sent to the Hearing Contact List on March 22, 2023, at PDF 69-71.

²⁴ Hearing Transcript for March 9, 2023, as sent to the Hearing Contact List on March 13, 2023 ["Transcript, March 9"], at PDF 69-71.

²⁵ *Ibid* at PDF 94.

²⁶ *Ibid* at PDF 89-90.

analysis;²⁷ however, KGS did not conduct any investigations that would refute Stantec's work, and they are not qualified to refute Stantec's geotechnical engineering analysis because they are not geotechnical engineers.

35. Mr. McLachlin explained during the Hearing why – in his independent third-party view – Stantec’s geotechnical assessment was appropriate based on the knowledge of the geology in the Project area. Contrary to MSSAC’s assertion during their final arguments in the Hearing,²⁸ Mr. McLachlin explained that vertical jointing was considered in Stantec’s geotechnical work. He also explained that additional data will be collected prior to, and during, Project operations which will confirm the suitability of Stantec’s geotechnical assessment.²⁹ In other words, even if there is continuous vertical jointing or variation in sand conditions in the geology within the Project area, Sio Silica and Stantec will detect that and factor it into Project operations to ensure that the geotechnical criteria in Table 9 of the Stantec Geotechnical Report are met.
36. The balance of the evidence before the Commission is clear that if the criteria in Table 9 of the Stantec Geotechnical Report are followed, the thick limestone layer above the void space will provide adequate support and therefore will not cause surface subsidence.

C. Groundwater Issues

(a) Introduction to Groundwater Issues

37. Concerns were raised during the proceeding regarding groundwater quantity and flow, to ensure that the Project does not affect the sustainable levels of groundwater in the underlying carbonate and sandstone aquifers. Concerns were also raised regarding groundwater quality, particularly related to potential quality impacts if the shale layer between the two aquifers collapses and the two aquifers intermix, but also related to (1) whether the materials in the shale will cause any impacts to water quality if it collapses into the sandstone aquifer or (2) if the Project will result in oxygen entering the aquifers that could negatively affect their chemistry.
38. As indicated above, these are highly technical and specialized issues. For groundwater quantity and flow, they are matters of hydrogeology. For groundwater quality, they are matters of geochemistry. Recognizing that groundwater is important (as asserted by MBEN/OLS in their written legal argument, and which Sio Silica fully accepts), Sio Silica retained experts at AECOM who conducted extensive groundwater studies to support the Project EAP, which go beyond standard practice in the area.

²⁷ See e.g., Hearing Transcript for February 28, 2023, as sent to the Hearing Contact List on March 13, 2023 [“Transcript, February 28”], at PDF 24-25.

²⁸ Transcript, March 15 at PDF 47-48; MSSAC Written Submission at 10.

²⁹ Hearing Transcript for March 14, 2023, as sent to the Hearing Contact List on March 17, 2023 [“Transcript, March 14”], at PDF 62-63.

(b) Groundwater Quantity and Flow

39. As with geotechnical matters, Sio Silica retained some of the top experts in Canada to ensure the Project does not cause any negative effects on groundwater. For hydrogeology, the technical team was led by Ryan Mills and Dr. Miln Harvey from AECOM. Mr. Mills is a Senior Hydrogeologist with 21 years of experience in the field, including extensive experience for mining projects. Dr. Harvey has a Ph.D. in Civil Engineering, focusing on groundwater modelling, and has more than 25 years of experience in hydrogeological analysis and modeling, including development of groundwater models for mining projects.³⁰
40. As indicated above, AECOM developed a numerical flow model to support the Project EAP, which is something that recently approved EAPs that proposed to withdraw significantly more water from the same general area did not include.
41. Sio Silica also had leading hydrogeology experts in southeast Manitoba review AECOM's draft Hydrogeology and Geochemistry Assessment Report and provide comments on it, including Dr. Grant Ferguson from the University of Saskatchewan and Jeff Bell from Friesen Drillers Ltd.³¹ Neither of them identified any major concerns and AECOM incorporated their comments into the final Hydrogeology and Geochemistry Assessment Report that was filed in support of the Project EAP.
42. The Commission also heard from a few other hydrogeology experts during the Hearing, including Mr. Boutin, Mr. Mann from KGS, and Dr. Hollander, formerly from the University of Manitoba. While there were differences of opinion expressed during the Hearing about how studies should be designed and carried out, that is not unusual. Reasonable people can, and sometimes do, disagree. But Mr. Boutin and Mr. Mann – both of whom conduct work for project applications – both generally supported AECOM's modelling work.
43. Mr. Boutin expressly agreed that AECOM's model "makes sense" and was conducted in accordance with industry standards.³²
44. Mr. Mann testified that AECOM's model was reasonably calibrated and that its metrics and measures were "pretty good."³³
45. The outlier was Dr. Hollander, who took issue with certain aspects of AECOM's model and claimed that it was unreliable. Respectfully, the evidence before the Commission does not support that conclusion. AECOM's model used similar methods as past models of the

³⁰ AECOM, *Vivian Sand Project – Hydrogeology and Geochemistry Assessment* (February 28, 2023) at PDF 3, online: http://www.cccmanitoba.ca/hearings/silica-sand-extraction-project/doc/water_pres-2023-02-28-sio-silica_ccc_hearing_606640258_final.pdf ["Hydrogeology and Geochemistry Assessment Summary"].

³¹ Dr. Grant Ferguson and Mr. Jeff Bell's reviews of AECOM's draft Hydrogeology and Geochemistry Assessment Report were filed in their entirety via an email sent to the Hearing Contact List on March 1, 2023.

³² Transcript, March 8 at PDF 94.

³³ Transcript, March 9 at PDF 84-85.

same aquifers that Dr. Hollander himself used, and the outputs of AECOM's model aligned well with past studies of the aquifers in southeast Manitoba. Groundwater modelling is largely an exercise of professional judgment,³⁴ and Dr. Hollander's experience with groundwater modelling is mostly in academia and government, where the objective of modelling is not to understand the effects of a particular project, as in this case. As Mr. Mills explained during the Hearing, there is an important distinction between academic research and work performed to support a project application, such as the Project EAP.³⁵

46. Given his focus in academia and government, it is not surprising that Dr. Hollander's professional judgment in this case was different than that of the professionals who develop groundwater models for project applications. But that does not make his opinions correct and the other professionals' opinions incorrect.
47. The Commission must consider all of the evidence before it regarding hydrogeology. Neither Dr. Hollander nor any other hydrogeological expert in the Hearing suggested that the Project will negatively affect groundwater quantity in the region. The evidence is that the net groundwater withdrawal volumes proposed for the Project are very small relative to the size of the aquifers and other groundwater users in the region.³⁶
48. Further, the pumping test data for the Project confirms that while there will be small, localized drawdown in the immediate vicinity of active extraction wells, the groundwater levels will largely recover to their baseline levels within about two days of extraction ceasing.³⁷ Sio Silica will employ extensive monitoring and mitigation measures to avoid and mitigate any effects on local water wells, and there is no evidence there will be any material effects on local water users.
49. As noted above, much larger withdrawals of groundwater have been approved in the same area in recent years, without any hydrogeological model to support them. The facts that (1) Sio Silica retained experts to develop a hydrogeological model, (2) it was reviewed by several independent experts in the area, (3) other hydrogeologists during the Hearing supported the quality of the model, and (4) the model produced results that align with past studies of the aquifers, all goes beyond the evidence that was relied on in the recent approval of those other EAPs and provides significant comfort that the Project will not cause any negative effects on groundwater levels.
50. It's also notable that the AECOM's hydrogeology and geochemistry work was reviewed by experts within the Government as part of TAC review process and they had no concerns with it. The Department's Groundwater Management Section has specific expertise in such

³⁴ Transcript, March 8 at PDF 94.

³⁵ Transcript, March 14 at PDF 5-6.

³⁶ AECOM, *Vivian Sand Project – Hearing Rebuttal* (March 14, 2023) at PDF 29, online: http://www.cccmanitoba.ca/hearings/silica-sand-extraction-project/doc/PRES-2023-03-14Sio%20Silica%20CEC%20Hearing%20+%20Rebuttal_606640258_FINAL.pdf [“Sio Silica Rebuttal”].

³⁷ AECOM, *Vivian Sand Extraction Project – Hydrogeology and Geochemistry Assessment Report* (July 2021) at PDF 6-7, 89, online: https://www.gov.mb.ca/sd/cal/registries/6119/appendix_a_part1.pdf. See also Transcript, March 1 at PDF 30.

matters, being the section of the Government tasked with managing aquifers, and they did not express any concerns with AECOM's work or the Project's effects.

51. Based on a proper weighting of all of the evidence in the Hearing, Sio Silica respectfully submits that the Commission must find that the Project will have no material impact on groundwater levels or flow.

(c) Groundwater Quality

52. The only two experts in groundwater quality (i.e., geochemistry) who provided evidence during the Hearing both appeared in support of the Project EAP. They were Dr. Cheibany Ould Elemine from AECOM, and Dr. Tom Meuzelaar from Life Cycle Geo – an independent third-party reviewer – both of whom are Ph.D. geochemists with 20 or more years of experience assessing geochemistry issues for mining projects, both in Canada and around the world. The groundwater quality issues that were discussed during the Hearing – issues like acid rock drainage and metal leaching – fall squarely within the expertise that only Dr. Ould Elemine and Dr. Meuzelaar offered during the Hearing.³⁸
53. Dr. Ould Elemine and Dr. Meuzelaar considered each of the concerns raised during the Hearing regarding water quality and explained why none of them will cause negative effects to water quality in the underlying carbonate and sandstone aquifers. They, together with other experts from AECOM, explained during the Hearing that (1) water in the two aquifers are already inter-mixing, (2) the gradients between the aquifers will mean that significant additional inter-mixing will not occur as a result of the Project, and (3) even if it did, there would be no negative effects to the water quality in the aquifers because both aquifers are fresh, good quality aquifers with similar water quality. As Mr. Mills explained, where the two aquifers are interconnected, which they are throughout the broader region, they are already functioning as a single aquifer.³⁹
54. Dr. Ould Elemine and Dr. Meuzelaar further explained that the water quality in the small volumes of water trapped in the shale layer is also fresh and of a similar quality to the surrounding aquifers, so it will not harm the water quality if it is released during collapse of the shale. And, they explained that acid rock drainage and associated metal leaching will not be an issue in the aquifers because the formation will remain saturated throughout Project operations, and there will consequently be very limited oxygen available to create any such reaction.⁴⁰
55. Experts retained by Sio Silica also explained why Mr. LeNeveu's theory about contaminants from the ambient air entering the compressed air and contaminating the aquifers is entirely unsubstantiated because, among other reasons, Sio Silica is proposing to use the same types of drilling practices that have been employed across Manitoba for

³⁸ Hydrogeology and Geochemistry Assessment Summary at PDF 3.

³⁹ Transcript, March 14 at PDF 39.

⁴⁰ See e.g., Transcript, February 28 at PDF 158.

decades and there is no evidence of compressed air from such practices negatively affecting groundwater.⁴¹

56. While non-experts provided non-expert opinions regarding water quality issues, the Commission should rely on the two experts who provided evidence about this issue during the Hearing, which is uncontroverted that the Project will not cause any negative effects to water quality in the aquifers.

(d) Aquifer Vulnerability

57. There was also a suggestion during the Hearing that the Project will increase the vulnerability of the aquifers by creating additional inter-connections between them, and MBEN/OLS talked about aquifer vulnerability in their written legal argument. Experts retained by Sio Silica responded to this issue fully in rebuttal during the Hearing. They showed that the aquifers are considered to have low vulnerability currently, they are well protected by thick overburden sediments that overly the carbonate aquifer, and the Project will have no effect on the vulnerability of the carbonate aquifer, from which most groundwater users in the region source water.⁴²
58. There is no evidence that the Project will cause contamination of the aquifers. In the unlikely and hypothetical event that contamination from the surface does reach the carbonate aquifer (from a source other than the Project), there is no evidence that the Project would have any meaningful effect on how that contamination behaves in the subsurface. So, there is simply no evidence that the Project will cause any material effect on aquifer vulnerability.

(e) Waste Management

59. The evidence before the Commission regarding waste management is quite clear and simple. Sio Silica is proposing to capture and contain all wastes that are generated during silica sand extraction, and to dispose of them at a licensed disposal facility.⁴³ There is no reasonable risk that waste materials will cause any adverse effects on the surface environment at the Project site, particularly with the implementation of Sio Silica's proposed Waste Characterization and Management Plan. Mr. Mann agreed with that conclusion if Sio Silica stores any waste materials in an engineered containment and disposes of them at a licensed facility, which is what Sio Silica proposes to do.⁴⁴ As a result, while this was an issue that was raised during the Hearing, the evidence is uncontroverted that waste from extraction will not cause any material environmental impacts.

⁴¹ See e.g., Transcript, March 14 at PDF 73-75.

⁴² Sio Silica Rebuttal at PDF 31.

⁴³ Hearing Transcript for March 2, 2023, as sent to the Hearing Contact List on March 22, 2023 [“Transcript, March 2”], at PDF 168.

⁴⁴ Transcript, March 9 at PDF 111-113.

(f) Cumulative Effects

60. The final key issue raised during the Hearing was cumulative effects, which came up repeatedly but with different views regarding what a cumulative effects assessment entails and who should be responsible for conducting such work. As with other issues, the Commission should base its advice and recommendations to the Minister on the evidence before it.
61. The material facts are that a cumulative effects assessment is not required for the Project EAP.⁴⁵ While the Commission has made recommendations to the Government about cumulative effects for certain previous projects, the facts of those projects are materially different than this Project,⁴⁶ including the Pembina Valley Project relied upon by MBEN/OLS during their final arguments. That project involved very large water withdrawals of water and exports of water outside of the area through a pipeline that was more than 100 kilometres long,⁴⁷ and it was not supported by any groundwater modelling.⁴⁸ The terms of reference for each Commission review are also different, and the terms of reference for the Pembina Valley Project were materially broader⁴⁹ than the Terms of Reference here. In any event, the Government has decided not to change the EAP Guidelines based on previous recommendations from the Commission. Sio Silica followed the applicable requirements for the Project EAP, just like other recently approved EAPs discussed above and, again, Sio Silica should not be faulted for that.
62. Mr. Mills from AECOM confirmed during the Hearing that even if a cumulative effects assessment had been undertaken for groundwater and considered Sio Silica's withdrawals over a 24-year period (which seemed to be the key cumulative effects issue for some participants), that would likely have made no difference to the outcome of AECOM's assessment of groundwater effects.⁵⁰
63. While cumulative effects can be an important issue in certain contexts, that does not make it an importance issue for the Project, and the evidence before the Commission demonstrates that there are no issues with cumulative effects associated with the Project.
64. In their final arguments, MBEN/OLS asserted that any well-performed environmental assessment must include a cumulative effects assessment, relying extensively on

⁴⁵ Transcript, March 2 at PDF 74.

⁴⁶ Transcript, March 8 at PDF 154.

⁴⁷ Transcript, March 2 at PDF 159.

⁴⁸ Commission, *Report on Public Hearing – Pembina Valley Water Cooperative* (February 2007) at PDF 34-35, online: http://www.cecmnitoba.ca/hearings/pembina-valley-water-cooperative-supplimental-groundwater-supply-system/doc/FinalReport/commissioned-reports-2006-2007-pembina_valley_water_cooperative1.pdf.

⁴⁹ *Ibid* at PDF 13.

⁵⁰ Transcript, March 14 at PDF 33-34.

Mr. Boutin and Mr. Wiatzka to support that view.⁵¹ But that is effectively asking the Commission to amend the Government's EAP Guidelines based on MBEN/OLS' view that no EAP should be approved unless it is supported by a cumulative effects assessment. As noted above, that is beyond the scope of the Terms of Reference, and it ignores the fact that other recent EAPs for much larger groundwater withdrawals from the same general area have been approved without any cumulative effects assessment to support them. As for MBEN/OLS' reliance on Mr. Boutin and Mr. Wiatzka regarding cumulative effects assessment and what should be required in EAPs, both witnesses acknowledged that they have never prepared an EAP in Manitoba and only have general familiarity with the EAP Guidelines.⁵² Their views about what should be done for an EAP in Manitoba should therefore be given little, if any, weight.

65. In their written legal argument, MBEN/OLS relied on quotes from the Supreme Court of Canada ("SCC") regarding the proper interpretation of the *Canadian Environmental Assessment Act*; however, that Act expressly mandated the assessment of cumulative effects, unlike *The Environment Act*. The SCC decisions relied on by MBEN/OLS have no relevance to the proper interpretation of *The Environment Act* and whether cumulative effects assessments are required under that Act.
66. Based on *The Environment Act* itself, MBEN/OLS further suggested in their written legal argument that the definition of "development" in that Act requires that environmental assessments for an EAP consider cumulative effects. However, that interpretation cannot be accepted. If the Legislature intended for project proponents to conduct cumulative effects assessments for every EAP, they would have said that. But they did not. The definition of "development" cannot reasonably be construed to expand the scope of the environmental assessment process when the provisions of the Act that address the environmental assessment process do not contemplate such an expanded scope. Further, as already noted, *The Environment Act* expressly requires that proponents follow the detailed requirements contained in the EAP Guidelines and the EAP Guidelines do not include any reference to cumulative effects. As a result, in our view, it would be an error of law for the Commission to conclude that the definition of "development" in the Act requires proponents to conduct cumulative effects assessments for every EAP.
67. MBEN/OLS also asserted during their oral argument that a cumulative effects assessment must consider individual groundwater withdrawals, in combination with other withdrawals,⁵³ based on various Government policy documents related to aquifer management. In response, and further to all the above, Sio Silica notes that AECOM did consider other groundwater users when its assessed impacts on groundwater quantity and flow. It is incorrect to suggest that AECOM only considered the Project withdrawals, in isolation from other users in the region. MBEN/OLS also ignore that fact that the

⁵¹ Transcript, March 15 at PDF 74-7. See also MBEN/OLS Closing Argument at PDF 83, online: http://www.cecmanitoba.ca/hearings/silica-sand-extractionproject/doc/23%2003%2015%20MBEN%20OLS%20Closing%20Slides_to%20file.pdf.

⁵² Transcript, March 6 at PDF 75-76; Transcript, March 8 at PDF 74.

⁵³ Transcript, March 8 at PDF 54.

groundwater effects of the Project will be transient, not cumulative, as Mr. Mills explained in rebuttal.⁵⁴ So, there is no evidence to support this aspect of MBEN/OLS' argument.

V. OTHER ISSUES RAISED DURING THE HEARING

A. Uncertainty

68. The concept of uncertainty came up throughout the Hearing, but there is inevitably uncertainty associated with natural resource development projects, whether they are large projects or smaller ones (like this Project) that propose to apply existing technologies in new ways. While models are tools that help predict potential future effects and reduce uncertainty, they cannot predict future effects without any uncertainty.
69. Rather than focusing on whether there are uncertainties associated with a project, which is inevitable, the focus should be on how to manage those uncertainties. In this case, Sio Silica has done that in few important ways, including:
- (a) having the experts that it retained adopt very conservative – and sometimes “worst case – scenarios in their assessments, to reasonably capture the full range of potential Project effects;
 - (b) proposing extensive ongoing monitoring and mitigation plans and additional testing after the issuance of an EAL for the Project, to gain as much data as reasonably practical; and
 - (c) continually incorporating this new information into the models prepared for the Project, to ensure that actual outcomes fit within the modelled parameters, or – in the unlikely event that they do not – modifying Project operations to avoid any unintended outcomes.
70. Sio Silica has committed to include local governments in the finalization of the detailed monitoring and management plans and to provide them access to the results of that monitoring. A representative of Peguis First Nation also testified that they will work with Sio Silica to establish third-party environmental monitoring, and that Peguis First Nation supports the Project as proposed in the EAP.⁵⁵
71. Either the experts retained by Sio Silica have correctly predicted how the proposed silica sand extraction will affect the environment (in which case there will be no material effects), or the monitoring and additional data collected will determine that the Project designs need to be modified to remain within the parameters assessed in the model prepared for the Project (in which case that will happen before any material environmental effects occur). In either case, the Project will not cause any material environmental effects.

⁵⁴ Transcript, March 14 at PDF 33.

⁵⁵ Hearing Transcript for March 13, 2023 (evening), as sent to the Hearing Contact List on March 16, 2023, at PDF 66.

B. Compliance with Regulations

72. Another issue that came up during the Hearing was compliance with regulations, which is a legal issue that the Commission is not required to decide in order to fulfill the Terms of Reference. In any event, the regulations that apply to drilling water wells in Manitoba require wells to be constructed and sealed in a manner that prevents the interconnection and mixing of groundwater having distinctively different characteristics within the same aquifer or different aquifers.⁵⁶
73. The reasons for the regulatory prohibition on mixing groundwater of distinctively different characteristics, as Sio Silica understands it,⁵⁷ is that there are parts of the Manitoba with saline aquifers, and there have been a history of drinking water aquifers becoming contaminated with saline water from deeper aquifers. But the evidence is that saline water contamination will not happen in this case. Despite the regulations, there are over 1,000 wells which currently connect the carbonate and sandstone aquifers, and no adverse effects have been detected as a result of those interconnections.
74. Sio Silica will construct and seal its wells in accordance with the regulations. Even if the Project results in collapse of the shale layer and greater communication between the aquifers, those wells will still be constructed and sealed in accordance with the regulations, including surface sealing to protect against surface contamination. As discussed above, the water quality in the aquifers is not of a distinctively different quality, meaning that there will be no mixing of groundwater having distinctively different characteristics. For these reasons, Sio Silica will comply the applicable regulations.
75. In their final arguments, MBEN/OLS asserted that Sio Silica will be contravening the regulations because there will be mixing between aquifers.⁵⁸ In response, and further to all the above, Sio Silica submits that to properly interpret the meaning and requirements of any applicable regulations, those regulations need to be read harmoniously to ascertain their overall intent.⁵⁹ There should not be materially different obligations in different regulations which are essentially intended to deal with the same issue. When the applicable regulations are read harmoniously, the prohibition against mixing between aquifers only applies to aquifers with distinctly different qualities, which will not be caused by the Project. For these reasons, Sio Silica will not be contravening the applicable regulations.

⁵⁶ *Well Standards Regulation*, Man Reg 215/2015, s. 2.

⁵⁷ Sio Silica Response to CEC-IR-009a), online: http://www.cecmanitoba.ca/hearings/silica-sand-extraction-project/doc/ir_response_round1_part1.pdf.

⁵⁸ Transcript, March 15 at PDF 79-81.

⁵⁹ See e.g., *British Columbia v. Musqueam Block F Land Ltd.*, 2023 BCSC 157 at para 93; citing *Bell ExpressVu Limited Partnership v. Rex*, 2002 SCC 42 at para 27. See also *Kardynal v. Shumlich*, 2021 ABQB 357 at para 29.

C. Adequacy of the Record

76. Another issue that came up during the Hearing was the adequacy of the record before the Commission, and a suggestion by some that Sio Silica has not provided sufficient information. But, as discussed above, Sio Silica followed the Government's requirements for a project EAP like this. Comparing the Project EAP to other recently approved EAPs, the level of information provided in support of the Project EAP meets or exceeds what is typically provided. The TAC and the public reviewed the Project EAP and Sio Silica responded to all comments that were provided. The Commission's review process allowed parties to request additional information through two rounds of information requests, and Sio Silica responded to all such requests that were within the scope of the proceeding. Experts for Sio Silica also responded to questioning over the course of four days during the Hearing.
77. As projects advance through the planning and development process, it is inevitable that additional work will be done and new information will become available over time, as occurred during the Commission's review of the Project EAP. But the record before the Commission demonstrates that Sio Silica provided all required information at the outset of the process, and it has reasonably responded to all subsequent requests for further information. Sio Silica submits that the Commission has more than enough information before it to reasonably assess the potential effects of the Project, in accordance with the Terms of Reference.
78. While additional data would be gathered after an EAL is issued for the Project – and the details of Sio Silica's monitoring and mitigation plans would also be finalized after issuance of an EAL to reflect any conditions imposed in the licence – the evidence is that this approach is a standard and accepted practice. That view was shared by one of the Commission's technical advisors, Mr. Wiatzka.⁶⁰ While Mr. Mann suggested that additional work should be performed before issuance of an EAL for the Project, he acknowledged during questioning that he has no experience developing mitigation or monitoring plans for mining projects⁶¹ and that these types of plans are typically finalized after issuance of a licence.⁶²
79. The fact is that Sio Silica has conducted more detailed studies and analyses than other projects at this stage of development. While Sio Silica proposes to collect additional data after issuance of an EAL and during Project operations, the science that underlies Sio Silica's assessment of environmental effects is sound, it has incorporated conservative (sometimes very conservative) assumptions, and Sio Silica's proposed mitigation and monitoring plans will be designed to ensure that the Project does not cause any environmental effects beyond what has been assessed. Most of those plans were filed with the Commission in draft and were generally supported by the relevant experts during the Hearing.

⁶⁰ Transcript, March 6 at PDF 8.

⁶¹ Transcript, March 9 at PDF 79.

⁶² Transcript, March 9 at PDF 106.

80. So, while there are inevitably areas where additional information will be collected after a project is approved, that does not mean that the Commission lacks sufficient information to assess the Project's likely environmental effects. The information before the Commission is more than sufficient to allow it to make informed findings about the Project's likely effects on the environment and human health.

D. Environmental Assessment Methodology and the Shale as a VEC

81. During their oral argument in the Hearing, MBEN/OLS relied on a literature excerpt by Dr. Bram Noble and evidence from Mr. Wiatzka to argue that the Winnipeg shale layer should have been selected as a valued environmental component ("VEC") for specific assessment in the Project EAP.⁶³ The Commission should not accept this argument, for the reasons that follow.
82. First, on its face, the excerpt by Dr. Noble that relied on by MBEN/OLS is about ways to conduct environmental assessments. The excerpt was not submitted as evidence during the Hearing and no witnesses spoke to it during the Hearing. Accordingly, the Commission should not give it any weight.
83. Second, and contrary to the oral argument of MBEN/OLS, Sio Silica's evidence is that there are many different methodologies that can be used to conduct environmental assessments, and the EAP Guidelines in Manitoba do not require any particular methodology to be used,⁶⁴ whether in terms of selecting VECs or determining "significance" of effects (both discussed by MBEN/OLS in their final argument, relying on the Dr. Noble excerpt), or otherwise. There is no contrary evidence that the methods described in the excerpt by Dr. Noble are required for environmental assessments in Manitoba, and there is no evidence that they reflect industry practice.
84. Third, the excerpt by Dr. Noble discusses the concept of VECs, which are specific areas to focus on during an environmental assessment, recognizing that it is impractical to individually assess every specific environmental and socio-economic component that may be affected by a project. MBEN/OLS argued that the Winnipeg shale layer should have been selected as a VEC for specific assessment in the Project EAP. However, they chose not to ask any of the environmental assessment practitioners that participated in the Hearing whether they agree with that proposition. Further, the excerpt by Noble describes VEC selection as a matter of professional judgment, meaning AECOM's selection of VECs for assessment in the Project EAP does not create any legal deficiency in their assessment. Perhaps most importantly, the evidence before the Commission is that the shale layer was specifically assessed – both in terms of (1) its physical properties and how it could affect the environment if disturbed and (2) its value for the purposes of groundwater and separation of the aquifers.

⁶³ Transcript, March 15 at PDF 105-106.

⁶⁴ Sio Silica Response to MBEN/OLS-IR-012a), online: http://www.cccmanitoba.ca/hearings/silica-sand-extraction-project/doc/ir_mben_ols.pdf.

85. For the above reasons, treating the Winnipeg shale as a VEC would not have made any difference to the outcome of AECOM's assessment or the record before the Commission.
86. In response to MBEN/OLS' suggestion during their oral argument that there needs to be thresholds around how much shale can be impacted in the region,⁶⁵ there is no evidence to support that suggestion, either. Based on the evidence before the Commission (discussed in more detail below), there is no difference, in terms of groundwater quantity or quality, if there is a single void that causes shale collapse and intermixing of the aquifers, or numerous points of interconnection. The evidence simply does not support MBEN/OLS' suggestion that there needs to be some sort of threshold around shale disturbance.
87. For all the above reasons, the literature excerpt by Dr. Noble that MBEN/OLS relied on during their oral argument has no relevance to the Commission's recommendations regarding the Project, and the Commission should not accept their argument that that the Winnipeg shale layer should have been selected as a VEC for specific assessment in the Project EAP.

E. Claims that Well Seals will Fail in the Future

88. Some claims were made during the Hearing that at some undetermined future point in time, the seals around the wells that Sio Silica proposes to drill as part of the Project will fail and that will create open holes from the surface to the aquifers. However, those claims are speculative. There is no evidence before the Commission to support them and, as noted above, the Commission must base its recommendations on the evidence that is before it.
89. Further, based on the evidence that is before the Commission, Sio Silica proposes to drill wells that are similar in nature to conventional water wells, of which there are already thousands across Manitoba, and Sio Silica will employ sound industry practices to drill, seal and close its wells to meet (or exceed) the applicable regulations. The details of Sio Silica's well sealing and monitoring will be provided in the Progressive Well Abandonment Plan and Closure Plan, which will address, among other things, inspection of the wells post-extraction to ensure their long-term integrity.
90. Contrary to MBEN/OLS' oral argument, and a previous observation by Arcadis,⁶⁶ Sio Silica is not proposing to abandon its wells based on standard practice for groundwater wells. Sio Silica's proposed abandonment procedures were filed in its draft Progressive Well Abandonment Plan, which go beyond basic water well sealing practices, and they were discussed during the Hearing.⁶⁷ That draft Progressive Abandonment Plan was filed after Arcadis conducted its review of well sealing practices during the Hearing.
91. Based on all the above, there is no evidence that the long-term risks associated with the seals on Sio Silica's wells will be different than any other wells in Manitoba.

⁶⁵ See e.g., MBEN/OLS Closing Argument at PDF 48, online: http://www.cecmanitoba.ca/hearings/silica-sand-extraction-project/doc/23%2003%2015%20MBEN%20OLS%20Closing%20Slides_to%20file.pdf.

⁶⁶ Transcript, March 15 at PDF 121.

⁶⁷ See e.g., Transcript, March 2 at PDF 99, 182, 186-187.

F. Irreversibility of Subsurface Effects and “Uniqueness” of the Project

92. During the Hearing, some parties suggested that the Project’s effects on the subsurface will be irreversible, and the Project is somehow unique because it will affect resources near where people live. Respectfully, those suggestions should not persuade the Commission whatsoever.
93. In reality, there are various types of projects that occur and affect resources wherever people live. Projects like gravel quarries, buried pipelines, and meat processing plants, which are commonplace throughout communities in Canada and interact with groundwater and other environmental resources. Mr. Samoiloff from AECOM provided examples during the Hearing of specific mining projects that are located near where people live, including several in Manitoba.⁶⁸
94. Any mining project will, by definition, irreversibly affect the subsurface. That is the reality for numerous other types of projects as well. It should not matter whether geology is temporarily or permanently affected. What matters is how such changes will impact the environment, such as surface topography and groundwater. As noted above, the evidence in this Hearing is that the Project will not have any material impacts on the environment, regardless of the fact that subsurface changes will be “irreversible”.
95. Accepting the logic of some parties – that a project should not be permitted to proceed because it will have irreversible effects on subsurface geology, or because it will interact with environmental resources that need to be shared in society – would have significant consequences. It would mean there can never be another mining project in Manitoba, including mines that are needed to access critical minerals that are in high demand globally. It would also mean that there can never be another industrial development in areas of the province where people live, which is an absurd proposition that would effectively prevent our society from advancing and progressing into the future.
96. Despite such broader policy issues being outside the scope of the Terms of Reference, parties have invited the Commission to entertain them and recommend that the Project be rejected on that basis. If for some reason the Commission considers such broader policy issues, the Commission should also consider that the purpose of the Project is to produce raw materials for technologies that Canadian governments are relying on as the driver of future economic growth in a lower carbon or net-zero carbon economy. Raw materials like high purity silica sand are needed to achieve governments’ climate change objectives. If they are not mined in Manitoba, they will instead be imported from other parts of the world, potentially with more severe environmental effects and while forgoing all of the economic benefits of mining and developing those materials in Manitoba. Exporting those types of economic benefits is not in the best interest of Manitoba or of Canada.

⁶⁸ Transcript, March 14 at PDF 14-5.

VI. REPLY TO OTHER POINTS IN THE ARGUMENTS OF PARTICIPANTS

A. Other Points by MSSAC

(a) Alleged Deficiencies in the Geotechnical and Hydrogeological Assessments

97. During their final arguments in the Hearing, MSSAC alleged that there were several deficiencies in the geotechnical and hydrogeological assessments that were performed for the Project EAP, in addition to the alleged failure to address vertical jointing that has already been addressed. The remaining alleged deficiencies are discussed in turn throughout the rest of this section.
98. First, MSSAC alleged that the 65-degree slope in the sand that was incorporated into Stantec's geotechnical assessment was a calculation that only relied on side scan sonar data.⁶⁹ That is incorrect based on the evidence before the Commission. That calculation was based on standard penetration tests, which we heard Sio Silica's witnesses talk about during the Hearing.⁷⁰ They explained that those tests showed that the intact sand layer exhibited characteristics of very dense material,⁷¹ and that the assumptions in Stantec's geotechnical assessment were, in fact, conservative.
99. Second, MSSAC alleged that Sio Silica relied entirely on single well extraction tests,⁷² which is also untrue. As explained during the Hearing, Sio Silica also performed a two-well extraction test.⁷³ In any event, and contrary to suggestions by MSSAC (and MBEN/OLS) during their final arguments, the number of wells is not what drives the geotechnical assessment. During the Hearing, Mr. Bullen from Sio Silica explained, using an analogy of straws in a cup, that the number of wells drilled into a void space is not what matters; rather, it is the size of that void space that matters, and which was assessed by Stantec. Whether that void space is created with one well or five wells, the geotechnical assessment is essentially the same.⁷⁴
100. Third, MSSAC alleged a deficiency related to the strain weakening model in Stantec's geotechnical assessment, with strength declining to zero.⁷⁵ But during rebuttal in the Hearing, Mr. McLachlin explained that that will apply to the disturbed sands, not the intact, undisturbed pillar, and that was the basis for the geotechnical assessment.⁷⁶ This is a detailed aspect of geotechnical engineering. While MSSAC's witness, Mr. Mann, seemed

⁶⁹ Transcript, March 15 at PDF 49-51.

⁷⁰ Transcript, February 28 at PDF 9.

⁷¹ Transcript, February 28 at PDF 15, 34-5.

⁷² Transcript, March 15 at PDF 49.

⁷³ Transcript, February 27 at PDF 61-62, 110; Transcript, February 28 at PDF 20.

⁷⁴ Transcript, February 27 at PDF 177-178; Transcript, February 28 at PDF 50-51.

⁷⁵ Transcript, March 15 at PDF 50.

⁷⁶ Transcript, March 14 at PDF 86-87.

to struggle with this and may not fully understand the scope of Stantec's geotechnical assessment, that does not mean it is deficient for purposes of this assessment. As Mr. Mann acknowledged, he is not a geotechnical engineer.

101. Fourth, MSSAC alleged that three pieces of information were missing from the record, based on comments from Dr. Hollander.⁷⁷ However, Sio Silica's witnesses explained, in detail, during the Hearing where each of those pieces of information is, in fact, found on the record of this proceeding. That information has been fully addressed and was discussed during Sio Silica's rebuttal, among other portions of the Hearing.⁷⁸
102. MSSAC also stated in its final arguments that it is unclear whether Sio Silica has committed to provide the vertical gradients and fluxes modelled with loss of the shale aquitard.⁷⁹ To clarify, Sio Silica committed to sharing information about modelled vertical gradient changes during the Hearing,⁸⁰ which it did via an email sent to the Hearing Contact List on March 2, 2023. Sio Silica also committed to share information about modelled vertical flux changes in the future, but not during the timeframe of the Hearing due to the time required to process that information.⁸¹ As Sio made this commitment on the Hearing record, Sio is required to comply with it after the close of the Hearing.

(b) Recommended Conditions of an EAL for the Project

103. During their final arguments in the Hearing, MSSAC also recommended that several conditions be included in an EAL for the Project, if one is issued, on which comments are provided below.
104. One of their recommendations is that the first four-year period "be a trial period to test a cluster, perform diagonal boreholes, collect data" and that "any subsequent approvals require the Director (or other provincial decision-maker) to consult with impacted municipalities in order to determine whether a proposed alteration will be classified as minor or major (and therefore, whether a further public hearing will be required)."⁸² In response, Sio Silica first notes that it disagrees with the characterization of the first four-year period as a "trial period." It is the length of the Project, as applied for in the Project EAP, and – as noted by MSSAC – any further extraction will require subsequent approval. While data will be collected during the four-year length of the Project and models will be

⁷⁷ Transcript, March 15 at PDF 52-3.

⁷⁸ See Transcript, March 14 at PDF 41-45 for information regarding the allegedly missing information respecting groundwater quality brought on by mining operations. See Transcript, March 14 at PDF 46-50 regarding the impacts of limestone collapse, and considerations of trace metals in the water.

⁷⁹ Transcript, March 15 at PDF 51; MSSAC Written Submission at 5.

⁸⁰ Hearing Transcript for March 1, 2023, as sent to the Hearing Contact List on March 24, 2023 ["Transcript, March 1"], at PDF 51-53.

⁸¹ *Ibid.*

⁸² MSSAC Written Submission at 7. See also Transcript, March 15 at PDF 54-55.

continually updated based on that data, the four-year period will consist of commercial extraction operations, as described in the Project EAP.

105. Regarding the regulatory process for subsequent approvals, Sio Silica first wishes to clarify the evidence about how it intends to apply for any future extraction outside the scope of the Project EAP. MSSAC stated in its written submission that Sio Silica “confirmed that it is its intention to proceed beyond the first four year [*sic*] period by applying for alterations to any existing license [*sic*].” However, that is not entirely accurate. Rather, AECOM confirmed that while the “intent as it is now would be to file for notice of alterations,” there would be consultation with the Department’s Environmental Approvals Branch to “seek their guidance to whether or not a project would be suitable for a notice or alteration, or whether a new [EAL] would be applied for.”⁸³
106. Sio Silica also notes that, contrary to MSSAC’s final arguments, a public hearing is not necessarily required in respect of a major alteration. Like an EAP for a Class 2 development (discussed above), it is within the Minister’s discretion to decide whether a public hearing should be held in respect of a major alteration for a Class 2 development like the Project.⁸⁴
107. In any event, whether the Director or Minister consults with municipalities when deciding whether a proposed alteration will be classified as a major alteration is a matter of government policy and discretion and, respectfully, is beyond the scope of the Terms of Reference. The Terms of Reference do not permit the Commission to prescribe how future extraction should be applied for (e.g., whether as a notice of alteration or EAP), nor how they should be reviewed by the Government. Further, this recommended condition would amount to an improper fettering of discretion. A decisionmaker cannot predetermine how discretion will be exercised in the future in relation to a yet-to-be-submitted application, which would be an improper fettering of the Director or Minister’s discretion to decide how future applications should be dealt with.⁸⁵
108. MSSAC also made recommendations related to management and monitoring plans for the Project,⁸⁶ much of which is already reflected in the draft plans and/or Sio Silica does not object to. For example, Sio Silica expects and has contemplated for some time that finalization of the various proposed monitoring and mitigation plans would be required before commencement of Project operations, so it does not object to that request. However, Sio Silica does object to MSSAC’s suggestion that the geotechnical Trigger Action

⁸³ Transcript, March 2 at PDF 146.

⁸⁴ See e.g., the Department, *Information Bulletin – Alterations to Developments with Environment Act Licences* (February 2014) at PDF 3, online: <https://www.gov.mb.ca/sd/eal/publs/alteration.guidelines.pdf>. There, the Department clarifies that a major alteration is addressed pursuant to s. 14(3) of *The Environment Act*. See also *The Environment Act*, ss. 11(10), 11(10.1) and 14(3), which clarify that a major alteration for a Class 2 development (e.g., the Project) required the filing of an EAP and that an EAP for a Class 2 development only requires a public hearing if the Minister decides that it does.

⁸⁵ See e.g., *Happy Adventure Sea Products (1991) Ltd. v. Newfoundland and Labrador (Minister of Fisheries and Aquaculture)*, 2006 NLCA 61 at paras 16, 18-19, 23-27; citing *Pacific National Investments Ltd. v. Victoria (City)*, 2000 SCC 64.

⁸⁶ MSSAC Written Submission at 8, 10-11.

Response Plan should include remediation for void spaces if surface subsidence occurs in the future.⁸⁷ There is no evidence before the Commission about whether or not such remediation would be possible, and it would be an error of law to impose a condition that is incapable of being satisfied.⁸⁸ The Commission must instead base its recommendations, including regarding EAL conditions, on the evidence before it. The evidence before the Commission demonstrates that surface subsidence will not occur as a result of the Project, and various monitoring and mitigation plans that have been proposed are intended to ensure that.⁸⁹ There is thus no need to prescribe any requirements for remediation of void spaces if subsidence occurs as part of an EAL issued for the Project.

109. Regarding the recommendation that a form of stakeholder monitoring committee be established, like the public liaison committee required in the EAL for the Red River Floodway Expansion,⁹⁰ Sio Silica is generally supportive of the concept of a similar committee that is involved in the development of monitoring programs, receives data through monitoring reports, and whose members include local governments and relevant Government entities (e.g., the Department's Groundwater Management Section), as discussed in the Commission's report that recommended the establishment of a public liaison committee as a condition of the EAL for the Red River Flood Expansion.⁹¹ Sio Silica is also supportive of a condition, like in that EAL, that the licensee be required to provide the Director a proposal to establish such a committee, including its terms of reference, membership, and administration, after the issuance of an EAL.⁹² To be clear, Sio Silica could not locate any information about the terms of reference, precise membership, or administration of the public liaison committee established pursuant to the EAL for the Red River Floodway Expansion⁹³ and therefore cannot commit to proposing a terms of reference, membership, or administration that is like that committee.
110. Another one of MSSAC's recommendations that Sio Silica objects to is that Sio Silica be held financially responsible for any impacts on municipal infrastructure and that a stakeholder monitoring committee be the body that would resolve any disputes related to

⁸⁷ Transcript, March 15 at PDF 56-57; MSSAC Written Submission at 8, 10-11.

⁸⁸ See e.g., *Boardwalk Reit LLP v. Edmonton (City)*, 2008 ABCA 220 at paras 75-76, which discuss the general principle of law that it does not demand impossible things. While that case discussed the principle in the context of statutes, EAL conditions are analogous in that compliance with them is required by statute: see *The Environment*, s. 15(1). See also *Canada (Minister of Citizenship and Immigration) v. Vavilov*, 2019 SCC 65 at paras 85-86, where the SCC made clear that an administrative decision (e.g., the decision to impose conditions in an EAL) must be justified in relation to the facts before the decision maker and the law.

⁸⁹ Transcript, February 28 at PDF 22; Transcript, March 1 PDF 174.

⁹⁰ Transcript, March 15 at PDF 57-58; MSSAC Written Submission at 8.

⁹¹ Commission, *Report on Public Hearing – Red River Floodway Expansion* (June 2005) ["Red River Report"] at PDF 95, 96, 101, online: http://content.gov.mb.ca/mit/wm/public_hearing.pdf.

⁹² As contemplated in Clause 24 of the EAL for the Red River Flood Expansion (Licence No. 2691), online: <https://www.gov.mb.ca/sd/eal/archive/2005/licences/2691.pdf>.

⁹³ As contemplated in Clause 24 of the EAL for the Red River Flood Expansion (Licence No. 2691), online: <https://www.gov.mb.ca/sd/eal/archive/2005/licences/2691.pdf>.

the assessment of those impacts and any compensation to be paid by Sio Silica.⁹⁴ The evidence is that Sio Silica will be paying millions of dollars to the local municipality in the form of taxes, which are intended to address proportional impacts on municipal services and infrastructure. Sio Silica will also enter into a development agreement with the local municipality in relation to its approved Processing Facility, which will deal with impacts on municipal infrastructure. There is no evidence that these existing processes will be insufficient to address the Project's impact on municipal infrastructure (which were assessed in the Project EAP as minor, along with traffic⁹⁵). Further, this aspect of MSSAC's recommendation would effectively amount to amending the municipal tax regime in Manitoba, which is beyond the scope of the Terms of Reference. For these reasons, Sio Silica submits that the Commission should not recommend any conditions related to financial compensation for impacts to municipal infrastructure.

B. Other Points by MBEN/OLS

(a) Alleged Failure to Consider Southeast Regional Groundwater Management Plan

111. During their oral argument, MBEN/OLS talked quite a bit about the Southeast Regional Groundwater Management Plan ("SRGMP") (which they also referenced in their written legal argument) and they alleged that it was not considered by Sio Silica or AECOM during their assessments for the Project. They also alleged that the SRGMP was not referenced at all during the oral testimony of Sio Silica's witnesses.⁹⁶ In response, Sio Silica first notes that its rebuttal panel specifically referenced the SRGMP during their rebuttal testimony when they were discussing aquifer sustainability and who is responsible for aquifer management in Manitoba.⁹⁷ Sio Silica further notes that MBEN/OLS never asked Sio Silica's witnesses if the SRGMP was considered in their assessments, and there is no direct evidence as to whether or not they considered it. However, it is evident on the face of the SRGMP that it was published in 2010⁹⁸ and is thus thirteen years old. AECOM's evidence was that it relied on the most current information about aquifer management to inform its groundwater assessment. The fact that the SRGMP is thirteen years old and has not been revised (despite calling for a comprehensive review and revision within ten years⁹⁹), and there are newer Government publications about groundwater, is likely why there were not more references to the SRGMP in AECOM's assessment but, again, Sio Silica's witnesses were not provided an opportunity to provide direct evidence on this point.

⁹⁴ Transcript, March 15 at PDF 59-60; MSSAC Written Submission at 9, 11.

⁹⁵ AECOM, *Vivial Sand Extraction Project – Environment Act Proposal* (July 2021) at PDF 43-44, 46, 74, online: https://www.gov.mb.ca/sd/eal/registries/6119/eap_part2.pdf. See also Transcript, March 2 at PDF 128-134.

⁹⁶ Transcript, March 15 at PDF 68-69.

⁹⁷ Transcript, March 14 at PDF 32-33.

⁹⁸ Southeast Regional Groundwater Management Plan (April 2010) at PDF 1-2, online: https://www.jongerrardmla.ca/wcm-docs/docs/reports/srgmp_apr30_2010.pdf.

⁹⁹ *Ibid* at PDF 51.

(b) The Suggestion that the Area of Shale Collapse will Create More Interconnection between the Aquifers

112. MBEN/OLS suggested during their oral argument that there would be a much bigger impact in terms of aquifer intermixing caused by the Project relative to interconnecting water wells, because the area of shale collapse caused by Sio Silica's proposed extraction would be much larger than the area of a water well that interconnects two aquifers.¹⁰⁰ However, that is not supported by the evidence before the Commission. The evidence is that when aquifers with limited differences in hydraulic head are connected, each interconnection provides an opportunity for intermixing, and there is essentially no difference between a single interconnecting water well or a much larger area where shale has collapsed into a void space.¹⁰¹ MBEN/OLS' suggestion that that the area of shale collapse will create more interconnection of the aquifers, as compared with interconnecting water wells, is therefore not supported by the evidence.

(c) Suggestion that AECOM's Modelling Boundaries were Inadequate

113. MBEN/OLS also suggested during their oral argument that the boundaries used in AECOM's hydrogeological model for the Project EAP were inadequate for the purpose of assessing the sustainability of the aquifers. They relied on their witness, Mr. Boutin, for this, when Mr. Boutin stated that that the "[m]odel boundaries were appropriate for assessing the effects of a specific project, but not large enough to assess sustainability of regional groundwater supply."¹⁰² But that entirely misses the point. AECOM was assessing the effects of a specific project, and not the sustainability of regional groundwater supply. That goes beyond the scope of their model and of the Commission's review and was discussed by Sio Silica's rebuttal panel at some length during the rebuttal portion of the Hearing.
114. Further, there were many different groundwater models referenced during the Hearing, each of which used different boundaries or domains. For example, the model that Dr. Hollander co-prepared in 2018 used even smaller boundaries than what AECOM used for the Project EAP.¹⁰³ The evidence before the Commission is that the boundaries for each model are based on professional judgment, having regard to the objective of the model.¹⁰⁴ Sio Silica submits that the evidence demonstrates that AECOM's approach to modelling was appropriate given the purpose and objective of its model for the Project EAP.

(d) Suggestion that Recharge was a Deficiency in AECOM's Groundwater Model

115. MBEN/OLS further suggested during their oral argument that recharge was a key deficiency in AECOM's groundwater model for the Project EAP, that Sio Silica abandoned

¹⁰⁰ Transcript, March 15 at PDF 100-102.

¹⁰¹ Transcript, March 14 at PDF 39.

¹⁰² Transcript, March 15 at PDF 147.

¹⁰³ Transcript, March 7 at PDF 86-98.

¹⁰⁴ Transcript, March 8 at PDF 94; Transcript, March 14 at PDF 25.

its cross-examination of Mr. Boutin on this issue, and that AECOM did not meaningfully respond to it during rebuttal.¹⁰⁵ However, Sio Silica did not abandon its cross-examination of Mr. Boutin; rather, it asked questions to clarify what Mr. Boutin was saying about recharge, which was the purpose of Sio Silica's questioning on this issue. Also contrary to MBEN/OLS' suggestion, AECOM specifically responded to this issue during rebuttal. One of the things that AECOM explained was that recharge is very difficult to estimate in any groundwater model. They also explained that they selected their recharge values based on specific research into recharge in the Sandilands Area,¹⁰⁶ which Sio Silica submits was an appropriate approach.

(e) Alleged Project-splitting

116. Near the end of their oral argument, MBEN/OLS relied heavily on Arcadis to support statements in Arcadis' original report about alleged project splitting. However, that issue was unrelated to the scope of Arcadis' review, which Mr. Wiatzka acknowledged during questioning when he confirmed that Arcadis was focused on geotechnical matters.¹⁰⁷ As indicated above, the Commission should give limited, if any, weight to the views of experts, even its own experts, on matters that go beyond their area of expertise and their focus of review in this proceeding.

(f) Proposed Recommendations to the Government

117. At the end of their oral argument, MBEN/OLS asked the Commission to make certain recommendations to the Government which, in Sio Silica's submission, would go beyond the scope of the Terms of Reference, which is explained above.

C. Additional Closing Remarks from RMSF

118. While Sio Silica does not have any points of reply to the initial closing remarks delivered on behalf of RMSF during the Hearing, it does have one point of reply to the additional written closing remarks that were submitted on behalf of RMSF, namely RMSF's request for an environmental bond. Sio Silica notes that this request for an environmental bond is not an issue that was raised during the Hearing, meaning there is no evidence before the Commission to support any recommendation that such a bond be required. Nonetheless, Sio Silica can confirm that the issue of a bond will be addressed through the Closure Plan that Sio Silica will develop with the Mines Branch of the Government.

VII. CONCLUSION

119. The potential environmental effects of the Project that the Commission must consider involve highly technical and specialized issues. The Commission should therefore rely on the expert evidence before it. Properly weighed, that evidence demonstrates that the Project will not result in any material adverse effects on the environment or human health.

¹⁰⁵ Transcript, March 15 at PDF 115.

¹⁰⁶ Transcript, March 14 at PDF 27-28.

¹⁰⁷ Transcript, March 6 at PDF 69-71.

120. The Project has been reviewed and supported by a large team of industry experts – many of whom are independent of the experts who prepared the Project EAP – and those experts overwhelmingly support the level of work that has been performed for a project at this stage of development, and they have not identified any material environmental or health effects. The Commission can, and should, rely on the expert evidence before it, which supports these conclusions and a positive recommendation for the Project.
121. For all of the reasons set out above, Sio Silica respectfully requests that the Commission advise and recommend that an EAL be issued for the Project.
122. All of which is respectfully submitted this 24th day of March, 2023.



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