

MANITOBA CLEAN ENVIRONMENT COMMISSION

HEARING

VIVIAN SILICA SAND EXTRACTION PROJECT

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Transcript of Proceedings  
Held at Mennonite Heritage  
Village

Steinbach, Manitoba

Thursday, March 2, 2023

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Reporters: Beatriz Menendez & Nidia Romero

1 THURSDAY, MARCH 2, 2023

2 UPON COMMENCING AT 9:30 A.M.

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4 THE CHAIRMAN: Chair. Well, good  
5 morning, everyone. I think my record's still fairly  
6 intact. It's only 9:33, so we weren't too late getting  
7 going here. We will pick up with the geochemistry and  
8 hydrogeology folks who are still sworn in, and our last  
9 person to ask questions is Byron Williams on behalf of  
10 MBEN. Is that correct?

11

12 MR. WILLIAMS: It is. I'm not under  
13 oath though, Mr. Chair, so.

14

15 THE CHAIRMAN: Sorry. I understand  
16 it. It's the panel that's -- that's still sworn in.  
17 Point -- point taken. And thank you for the correction.  
18 So, Byron, over to you.

19

20 MR. WILLIAMS: Williams speaking,  
21 thank you very much. And members of the panel, obviously  
22 I wasn't able -- able to be here yesterday, for which I  
23 apologize. I do want to assure you that Mr. Klassen has  
24 made me read all 31 pages of notes that he took yesterday.  
25 And so, to the extent that there is some apparent overlap

1 with what was discussed yesterday, our clients are either  
2 going to a different point, or from time to time, there  
3 may be something that was discussed but not really came up  
4 -- coming out as evidence, so will simply be for points of  
5 clarification in that event.

6  
7 And good morning to the AECOM panels, the  
8 independent reviewer, and to the Sio folks, as well. Most  
9 of my questions, I expect, will be for AECOM and you can  
10 decide who will answer them. I may have three or four  
11 questions for Sio in the course of our conversation.

12  
13 But to AECOM, first of all, Williams  
14 speaking, settled at Page 5 of your PowerPoint, you'll  
15 recall that there are references to certain legal  
16 documents, statutes, and regulations agreed?

17  
18 MR. MILLS: Ryan Mills with AECOM. That  
19 is correct.

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21 MR. WILLIAMS: Williams speaking.  
22 And just for clarity sake, you're -- you're not lawyers,  
23 agreed?

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25 MR. MILLS: That is correct.

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MR. WILLIAMS: And that was probably meant as a compliment, not as an insult, just so -- just so you know. Oh, do we have one more?

MR. MILLS: I'm just gonna ask that I'll continue my response before turning it back.

MR. WILLIAMS: I'm -- I did not mean to interrupt and I'm sorry for that.

THE CHAIRMAN: Chair. I'll just remind you to state your name, please, each time you push the button.

MR. MILLS: Ryan Mills with AECOM. I'm a professional geoscientist and there are professional engineers here on the panel.

MR. WILLIAMS: And just so I'm clear, recognizing that you're a professional geoscientist, professional engineers with impressive credentials, in that way, you do not profess expertise in the arcane art of statutory interpretation. Agreed?

1 MR. MILLS: Ryan Mills with AECOM. I am  
2 not a statute lawyer and I -- but we do regularly have to  
3 interpret those regulations and apply them in our work.

4

5 MR. WILLIAMS: Williams speaking.  
6 And just to be clear again, you don't profess expertise in  
7 statutory interpretation, agreed?

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9 MR. MILLS: That's correct. Ryan Mills  
10 with AECOM.

11

12 MR. WILLIAMS: Williams speaking.  
13 And at a high level, you'll agree that the Red River  
14 carbonate formation is a key source of potable water  
15 within the Rural Municipality of Springfield. Agreed?

16

17 MR. MILLS: Ryan Mills, correct.

18

19 MR. WILLIAMS: Williams speaking.  
20 And it serves as a significant source of groundwater for  
21 municipal, industrial, Residential, and agricultural uses  
22 through a large portion of southeastern Manitoba, correct?

23

24 MR. MILLS: Ryan Mills, correct.

25

1 MR. WILLIAMS: Thank you. Williams  
2 speaking. And the upper portion of the Red River  
3 carbonate aquifer, you'll agree, is characterized by a  
4 network of fractures, joints, and bedding planes. Agreed?

5

6 MR. MILLS: Ryan Mills with AECOM. Yes,  
7 that's correct. That is typically the weathered zone of  
8 carbonate.

9

10 MR. WILLIAMS: And this portion of  
11 the Red River carbonate -- Williams speaking -- aquifer,  
12 because of the network of fractures, joints, and bedding  
13 planes, they provide substantial permeability to, the  
14 aquifer, agreed?

15

16 MR. MILLS: Ryan Mills with AECOM. Yes,  
17 that's correct.

18

19 MR. WILLIAMS: And you'll agree --  
20 Williams speaking -- that the Winnipeg Formation Sandstone  
21 underlies the Red River carbonate aquifer throughout the  
22 project area. Agreed?

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24 MR. MILLS: Ryan Mills with AECOM. Yes,  
25 that's correct.

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MR. WILLIAMS: Williams speaking.

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And the Winnipeg Formation sandstone is confined and hydraulically separated from the overlying carbonate rocks of the Red River Formation by the -- by the Winnipeg Shale, correct.

MR. MILLS: Ryan Mills with AECOM. No, that is not correct. There's abundant literature to suggest that there's approximately 1,000 wells, or greater, that interfere with that hydraulic isolation.

MR. WILLIAMS: Let me -- let me try that a slightly different way. The Winnipeg Formation Sandstone is confined by the overlying carbonate rocks of the Red River Formation by the Winnipeg Shale. Agreed?

MR. MILLS: Ryan Mills with AECOM. The Winnipeg Sandstone is generally interpreted to be a confined aquifer, correct.

MR. WILLIAMS: And just to finish the thought, in terms of its reality as a confined aquifer, a primary actor overlying the Winnipeg Sandstone Aquifer, Is the Winnipeg Shell, agreed?

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MR. MILLS: Ryan Mills with AECOM. The -- there are several confining units, one of which is the Winnipeg Shale. There is a secondary confining unit that is the thick overburden sequence at -- from ground surface down to the top of the Winnipeg carbonate.

MR. WILLIAMS: Williams speaking. Thank you. And you'll agree that in terms of the Winnipeg Sandstone Aquifer, it provides an economic source of fresh water to a number of groundwater users in the regional project area. Correct?

MR. MILLS: Ryan Mills with AECOM. I cannot comment on the economics of the -- the water source, but I can state that it does provide a source of groundwater to users in the area.

MR. WILLIAMS: Thank you. Williams speaking. As discussed in Section 6, I don't think you need to turn there, of your final hydrogeological report, there are over 10,000 water wells registered within the groundwater model domain. Agreed? Page 16 from your report as well also gives that information, if you're looking for it.

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MR. MILLS: Ryan Mills with AECOM. Yes,  
that's correct.

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MR. WILLIAMS: And of those more than  
10,000 wells, W-E-L-L-S -- Williams speaking -- more than  
1,600 like within the regional project area. Agreed?

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MR. MILLS: Ryan Mills with AECOM. Yes,  
that's correct.

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MR. WILLIAMS: Williams speaking.  
And focusing on what the proponent describes as the  
regional project area, and based on the Groundwater  
Information Network Database, it is estimated there are  
about 1,500 domestic water wells within the regional  
project area, agreed?

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MR. MILLS: Ryan Mills with AECOM. Yes,  
that's correct. It's written here.

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MR. WILLIAMS: In the course of your  
work -- Williams speaking -- of course, you had to develop  
some level of familiarity with the extraction plans of Sio  
Silica within the project area, agreed?

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MR. MILLS: Ryan Mills speaking. Yes, that's correct. We were -- we became familiar with the extraction plans.

MR. WILLIAMS: And recognizing that your analysis was confined to that first four or five years, you also developed some high level of familiarity with the -- the broader plans of Sio Silica over the next 24 years. Agreed?

MR. MILLS: Ryan Mills with AECOM. We were generally focused on the first five years. We do -- we did understand that there was some sort of future consideration for continuing -- continuation of -- of the work.

MR. WILLIAMS: And it would be your understanding, or you would agree -- Williams speaking -- that in the original Sio Silica operating plans filed for approval in the EAP, it was expected that there would be over 1,600 extraction wells over the initial four-year operating. Agreed? It's in your report, at Page 23, if you need that.

1 MR. MILLS: Ryan Mills with AECOM. Yes,  
2 1,680 wells.

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4 MR. WILLIAMS: Williams speaking.  
5 You are now aware that under the revised extraction plan,  
6 that amount will be reduced by about 400?

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8 MR. MILLS: Ryan Mills, correct.

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10 MR. WILLIAMS: And given that you  
11 have some level of familiarity with the broader plans of  
12 Sio Silica, you'll understand that if -- if Sio ultimately  
13 gets the go around to proceed throughout the estimated 24  
14 year life for the project, there will be many thousands  
15 more extraction wells built, agreed?

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17 MR. MILLS: I can't comment on what the  
18 future may look like. The -- we're focused on -- I'll  
19 finish my ---

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21 MR. WILLIAMS: I'm apologizing to the  
22 witness. I wasn't trying to cut you off. I just  
23 inadvertently kept hitting the red lights, so there was no  
24 effort to cut you off. I apologize for that.

25

1 MR. MILLS: Ryan Mills with AECOM. Could  
2 you repeat the question please?

3

4 MR. WILLIAMS: Yes. Given your  
5 general familiarity, you're -- you would agree that if Sio  
6 gets the go ahead to proceed through the estimated 24 year  
7 life of the project, there will be thousands of more  
8 extraction wells built, agreed?

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10 MR. MILLS: Ryan Mills with AECOM. I  
11 cannot comment on future plans. We are focused here on  
12 the discussion for the first five years of operations that  
13 are the subject of the EAP.

14

15 MR. WILLIAMS: Ms. Weeden,, you'll  
16 agree that if you get the go ahead, you currently  
17 contemplate, over the 24 year life of the project,  
18 thousands of more wells -- extraction wells agreed?  
19 Williams speaking.

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21 MS. WEEDEN: This is Laura Weeden. As Ryan  
22 mentioned, we're focused on the first four years of the  
23 project at this time.

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25 MR. WILLIAMS: So you're declining to

1 answer my question?

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MS. WEEDEN: This is Laura Weeden. The CEC is looking at our extraction proposal, which is for the first four years of the project.

MR. WILLIAMS: Mr. Chair, I'm asking for a -- a direction from the Clean Environment Commission to ask Sio Silica to answer the question and if the -- in terms of the grounds for the our -- our request, you'll be aware that from the very start on day one of this hearing, Sio Silica was talking in their overview, business overview, of the 24 year life of the project. So that's certainly been put before this Board. It's essential context in our client's view and a pretty plain and simple answer, and so, we're asking that the witness be directed to answer it, Mr. Chair and members of the panel.

THE CHAIRMAN: Chair, I hear you. Give me one minute, please.

MR. DUNCANSON: Mr. Chair, if I could just make a short comment?

THE CHAIRMAN: Nope.

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MR. DUNCANSON: No?

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THE CHAIRMAN: Chair. Sander, please

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proceed.

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MR. DUNCANSON: Thank you, Mr. Chair.

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Sander Duncanson speaking. I think, Mr. Chair, what got

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the witnesses sort of hung up there was Mr. Williams'

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comment 'if Sio gets the go ahead'. The -- the go ahead

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that Sio is asking for and the EAP is -- is limited to the

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first four years of operations. Sio would have no legal

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authority to operate beyond that without coming back for

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further approval from -- for further approval. So, I

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think, if Mr. Williams wants to ask questions about

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generally Sio's plans over the course of 24 years, if it -

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- if it is successful, and first of all getting its

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initial *Environmental Act* licence, and then decides to

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proceed further from there, and is successful in obtaining

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subsequent authorizations that are not before the CEC, I'm

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willing to permit him to ask general questions of that

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nature, recognizing that no specific proposal has been

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submitted for that. But I think we need to be clear about

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asking questions that are within the scope of the EAP and

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questions that ---

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MR. WILLIAMS: Mr. Chair, I'll -- while we submit that the question was properly phrased, we can get it at a different way with -- with the kind assistance of my learned friend. So with that, Ms. Weeden, your plans over the next 24 years, you expect to -- to build, or to drill, thousands -- thousands of more extraction wells, agreed?

MR. BULLEN: It's Brent Bullen, Sio Silica. We would agree there would be more wells drilled, thousands more wells over a 24 year life.

MR. WILLIAMS: Thank you. Going back to AECOM, and focusing on the wells within the four-year period, the extraction wells, it would be your understanding that each of those wells would be intended to drill through the Red River carbonate, pierce the shale aquitard, and take sand from the Winnipeg Sandstone. That's your understanding, agreed?

MR. MILLS: Ryan Mills with AECOM. That is correct. They would be drilled from surface into the sandstone.

1 MR. WILLIAMS: Williams speaking.  
2 Thank you. At Section 3.7.2.3 of your Hydrogeological  
3 Assessment Final Report, AECOM shares your pumping test  
4 analysis. Agreed?

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6 MR. MILLS: Ryan Mills, correct.

7

8 MR. WILLIAMS: Williams speaking.  
9 And in terms of your examination of the water level  
10 responses in the BRU 95-8, BRU 95-9 area, you observe that  
11 the Winnipeg Shale is an effective hydraulic barrier to  
12 interaction between the two aquifers at this location.  
13 Agreed?

14

15 MR. MILLS: Ryan Mills with AECOM. I  
16 agree that it does provide a -- a barrier to vertical  
17 groundwater flow, however, it is a leaky aquitard, as  
18 evidenced by a response in the overlying carbonate  
19 aquifer.

20

21 MR. WILLIAMS: And just to -- at that  
22 location, my question was -- Williams speaking -- that it  
23 forms an effective hydraulic barrier to the interaction  
24 between the two aquifers at this location. that was your  
25 finding from your pumping analysis, correct?

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MR. MILLS: Ryan Mills with AECOM. I believe that is our finding, yes.

MR. WILLIAMS: And AECOM will be generally aware that solar scan information from extraction well BRU 92-8 reveals the collapse of the overhanging shale aquitard within four months of the creation of the sandstone void through silica extraction. Agreed?

MR. MILLS: Ryan Mills with AECOM. I believe you intended to say sonar scan and -- and yes, that is correct.

MR. WILLIAMS: This question -- Williams speaking -- probably goes to Dr. Elemine, and without asking you to elaborate, I'll ask you to confirm that the PHREEQC simulations were conducted to evaluate the impact of mixing of waters between the Red River carbonate and Winnipeg sandstone aquifers. Agreed?

MR. OULD ELEMINE: Cheibany Ould Elemine, AECOM. Yes, agreed.

1 MR. WILLIAMS: Williams speaking.  
2 You would agree as well, Doctor, that the effect of  
3 release of shale pore water, the collapse of the shale  
4 aquitard into the sandstone, was not considered in the  
5 PHREEQC model. Agreed?

6  
7 MR. OULD ELEMINE: Cheibany Ould Elemine,  
8 AECOM. Agreed.

9  
10 MR. WILLIAMS: Williams speaking.  
11 And more generally to AECOM, to the extent there is a  
12 collapse of the overhanging shale aquitard that may for --  
13 that may enable the interconnection or mixing of  
14 groundwater between the Winnipeg Formation and any  
15 overlying aquifer, agreed?

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17 MR. MILLS: Ryan Mills with AECOM. I  
18 believe that was a -- a statement, not a question. Could  
19 you maybe rephrase that as a question?

20  
21 MR. WILLIAMS: I thought I had but  
22 thank you for that. Williams speaking. You would agree  
23 that to the extent there is a collapse of the overhanging  
24 shale aquitard, that may enable the interconnection or  
25 mixing of groundwater between the Winnipeg Formation and

1 any overlying aquifer?

2

3 MR. MILLS: Ryan Mills with AECOM. There  
4 -- if the shale collapsed, that's correct, there would be  
5 an opportunity for interaction between the two aquifers in  
6 accordance with the prevailing gradients.

7

8 MR. WILLIAMS: Williams speaking.  
9 And to AECOM generally, your groundwater modelling  
10 contemplated changes in hydraulic conductivity of the  
11 Winnipeg Shale aquitard, correct?

12

13 MR. HARVEY: Miln Harvey for AECOM. Yes.

14

15 MR. WILLIAMS: Williams speaking.  
16 And I'll apologize to the panel again, I've just been a  
17 little quick from the buttons, so not trying to cut you  
18 off.

19

20 Your modelling did not contemplate or  
21 examine changes in storativity of the Winnipeg Sandstone  
22 aquifer, agreed?

23

24 MR. MILLS: Ryan Mills with AECOM. Within  
25 the model, during calibration, the -- the model was

1 adjusted so storativity was adjusted during calibration.  
2 During the predictive simulations, the storativity was not  
3 adjusted because the aquifer is a confined system and that  
4 should not change.

5

6 MR. WILLIAMS: It's partly because  
7 it's a -- Williams speaking -- it's a confined system, but  
8 the model is also not a coupled groundwater and  
9 geochemical model, agreed?

10

11 MR. HARVEY: AECOM, Miln Harvey. Agreed.

12

13 MR. WILLIAMS: Williams speaking.  
14 And to AECOM, in terms of scope of work and -- it would be  
15 correct to suggest that your hydrogeological and  
16 geochemical assessment was restricted to subsurface  
17 components of the project over its first four or five  
18 years of operation. Agreed?

19

20 MR. MILLS: Ryan Mills with AECOM. The  
21 primary focus was on the interaction between the project  
22 and the subsurface environment with a view or  
23 understanding that some of those materials would be  
24 brought to surface. And so, we did assess the project  
25 elements with a view to how those materials may be managed

1 in the future, which includes on surface.

2

3 MR. WILLIAMS: Thank you -- Williams  
4 speaking -- for that modest clarification, but it's in  
5 terms of the other part of my question. Temporally, it  
6 was restricted to the first four or five years of  
7 operation, agreed?

8

9 MR. MILLS: Ryan Mills, yes, that's  
10 correct.

11

12 MR. WILLIAMS: Williams speaking.  
13 So, the impact of any future activity by Sio Silica beyond  
14 the first five years has not been directly assessed.  
15 Agreed?

16

17 MR. MILLS: Ryan Mills with AECOM.  
18 Although the model extends to capture the full area, they  
19 have -- the impacts of sand extraction within those  
20 different footprints have not been directly evaluated.  
21 That's correct.

22

23 MR. WILLIAMS: Williams speaking. It  
24 just wasn't your job, in terms of your scope of  
25 assignment. Agreed?

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MR. MILLS: That's agreed.

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MR. WILLIAMS: Williams speaking.

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Your numerical groundwater model, in essence, assesses the short-term response of the aquifer to the stresses of groundwater and sand withdrawal. Agreed?

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MR. MILLS: Ryan Mills with AECOM. It assesses the impacts of groundwater withdrawals and reinjections.

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MR. WILLIAMS: Williams speaking.

Fair enough and thank you for that clarification. In terms of your model, streams, lakes, regional groundwater use, and groundwater level along the boundaries of the model domain are assumed to stay constant with time. Agreed?

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MR. HARVEY: Miln Harvey for AECOM. Yes,

we -- we assumed that the -- the boundary conditions at the edge of the model domain would remain constant.

24

25

MR. WILLIAMS: And it was beyond the

scope of your assessment -- Williams speaking -- to

1 develop a water balance for the regional aquifer system in  
2 the context of future groundwater use. Agreed?

3

4 MR. HARVEY: Miln Harvey for AECOM.  
5 Agreed.

6

7 MR. WILLIAMS: Williams speaking. In  
8 your numerical groundwater model, you did not incorporate  
9 an estimate of population growth and municipal development  
10 over the next 25 years, including its impact on the  
11 aquifers. Agreed?

12

13 MR. HARVEY: Miln Harvey for AECOM. That's  
14 usually within the scope of a groundwater or a water  
15 supply master plan, which was not a part of our scope.

16

17 MR. WILLIAMS: And just slightly  
18 reframing that question temporally -- Williams speaking --  
19 you did not incorporate an estimate of population growth  
20 and municipal development, including its impact on the  
21 aquifers, over the next five years in your model. Agreed?

22

23 MR. HARVEY: Miln Harvey for AECOM.  
24 Agreed.

25

1 MR. WILLIAMS: Williams speaking.  
2 You did not incorporate an estimate of industry growth  
3 that could rely on groundwater extracted from these two  
4 aquifers over the next five years in your model, agreed?

5  
6 MR. MILLS: Ryan Mills with AECOM. I  
7 guess -- I think the proposed project here would be  
8 considered probably an industrial user, so, we did  
9 directly incorporate that into the model, but industrial  
10 use by others and the growth of that, we did not.

11  
12 MR. WILLIAMS: Thank you. And --  
13 Williams speaking -- fair answer. And similarly, leaving  
14 -- in terms of the -- the same type of issue, you did not  
15 incorporate an estimate of industry growth that could rely  
16 on groundwater extracted from these two aquifers over the  
17 next 25 years into your model, with the exception of  
18 silica operations for the first four to five years.  
19 Agreed?

20  
21 MR. MILLS: Ryan Mills with AECOM. That's  
22 correct.

23  
24 MR. WILLIAMS: Williams speaking.  
25 You did not incorporate an estimate of agricultural

1 growth, or a need for additional groundwater extraction,  
2 over the next five years into your model. Agreed?

3

4 MR. MILLS: Ryan Mills with AECOM. That's  
5 true. The growth of other uses were not directly  
6 incorporated into the model.

7

8 MR. WILLIAMS: Williams speaking. To  
9 AECOM, I take it you're aware that your geotechnical  
10 colleagues prepared a PowerPoint to share with the -- the  
11 Clean Environment Commission for day one of the hearing.  
12 You're generally aware of that?

13

14 MR. MILLS: Ryan Mills with AECOM. Yes,  
15 that's correct.

16

17 MR. WILLIAMS: And I want to show you  
18 one slide from that geotechnical slide, Slide 7. You  
19 would have had a chance to -- to look at this document  
20 previously. Agreed? Williams speaking.

21

22 MR. MILLS: Ryan Mills with AECOM. Yes,  
23 correct.

24

25 MR. WILLIAMS: And for the record --

1 Williams speaking -- I had misspoken. I was looking for  
2 Slide 11, so, it's up there now. And you're aware that in  
3 the geotechnical assessment of the -- of the formations,  
4 AECOM identified fractured limestone above the competent  
5 limestone within that formation. You're aware of that?

6

7 MR. MILLS: Ryan Mills with AECOM. I  
8 believe you meant to say, Stantec found.

9

10 MR. WILLIAMS: Thank you so much for  
11 correcting me. And you're aware that -- Williams speaking  
12 -- that Stantec found fractured limestone above the  
13 competent limestone? Agreed?

14

15 MR. MILLS: Ryan Mills speaking. Yes,  
16 that's correct.

17

18 MR. WILLIAMS: Williams speaking.  
19 And you're aware, as well, that Stantec found fractured  
20 limestone underneath the competent limestone. Agreed?

21

22 MR. MILLS: Ryan Mills speaking. Yes, I'm  
23 aware there's a basal weathered zone, as well.

24

25 MR. WILLIAMS: And I wonder if we

1 could now turn to your PowerPoint, Exhibit H-013, Slide  
2 16, the Hydrogeology and Geochemistry Assessment. And  
3 would it be -- Williams speaking -- would it be correct  
4 that, in terms of your conceptual hydrogeological model,  
5 that you did not assume fractures in the limestone?

6  
7 MR. MILLS: Ryan Mills with AECOM. The  
8 basal and upper weathered zones are thin and were not  
9 directly included as separate features in the  
10 hydrogeological conceptual model or numerical model,  
11 although, we are aware that they exist. But the pumping  
12 test, it's important to remember, tested the intact system  
13 in the ground that encapsulates that variability to allow  
14 us to assign an equivalent porous medium value. Sorry,  
15 Ryan Mills again -- to represent those units.

16  
17 MR. WILLIAMS: Williams speaking.  
18 Thank you for that. And just so I'm clear, your  
19 conceptual model does not show the layers of fractured  
20 limestone. Agreed?

21  
22 MR. MILLS: Ryan Mills. We do not  
23 illustrate them on the drawing. We are, and were aware of  
24 them, and considered them in the assessment.

25

1 MR. WILLIAMS: Thank you. Williams  
2 speaking. Turning to Slide 18, you'll see a number of  
3 tables, and I'll direct your attention to the table  
4 labeled, "Measured versus Calibrated Recharge". Do you  
5 see that?

6

7 MR. HARVEY: Miln Harvey for AECOM. Yes,  
8 we do.

9

10 MR. WILLIAMS: In terms of the  
11 calibrated recharge values, are those derived from the  
12 2021 or 2023 numerical model?

13

14 MR. HARVEY: Miln Harvey for AECOM. Those  
15 recharge values represent both models. Both models are --  
16 are the same, except for operational schedule.

17

18 MR. WILLIAMS: Williams speaking.  
19 And thank you very much for that. So, what you're telling  
20 us is that the calibrated parameters did not change  
21 between 2021 and '23, but you were just responsive to the  
22 changes in the project plan?

23

24 MR. HARVEY: The -- hmm? Yeah.

25

1 UNIDENTIFIED SPEAKER: Introduce yourself.

2

3 MR. HARVEY: Miln Harvey for AECOM. The --  
4 the difference between the two, yes, was -- was a change  
5 in -- in the operational plan to -- to look at impacts.  
6 But the -- the basic model stays the same.

7

8 MR. WILLIAMS: Williams speaking.  
9 Thank you for that. Directing our attention now to the  
10 right of that slide to the figure labeled, "Measured  
11 versus Calibrated Conductivity", do you see that?

12

13 MR. HARVEY: Miln Harvey for AECOM. Yes.

14

15 MR. WILLIAMS: Excuse me. Williams  
16 speaking. On the Y axis, it displays hydraulic  
17 conductivity, agreed?

18

19 MR. HARVEY: Miln Harvey for AECOM. For  
20 everyone else, the Y axis is the one that goes up and  
21 down, and it displays hydraulic conductivity, and the  
22 scale is actually a log scale. So, each of those  
23 increments is a -- an order of magnitude.

24

25 MR. WILLIAMS: Focusing your

1 attention -- Williams speaking -- on the left, or Y, axis,  
2 and as we seek to understand the scale, you would agree  
3 that as we move towards the top of the axis, that would  
4 represent or suggest an aquifer. Agreed?

5

6 MR. HARVEY: Miln Harvey for AECOM.  
7 Aquifers and aquitards are defined on how much water they  
8 provide for -- you know, economically. So it's hard --  
9 it's a -- it's a relative term. Sometimes an aquifer is a  
10 shale, it's fractured, and we can get water from it  
11 because it's the only water we can get, you know, from the  
12 ground, and other times it's a very porous sand, and so,  
13 that's a relative term. It's hard to -- to pick an exact  
14 range for a ---

15

16 MR. WILLIAMS: Williams speaking.  
17 Notwithstanding the challenges in picking an exact range,  
18 if we're getting up to 1.E-0.3, we're in aquifer  
19 territory, agreed?

20

21 MR. HARVEY: Miln Harvey for AECOM.  
22 Agreed.

23

24 MR. WILLIAMS: And if we -- Williams  
25 speaking -- as we try to move down the Y axis in terms of

1 its representation of hydraulic conductivity, as we move  
2 towards the bottom of the -- that axis, we're getting into  
3 aquitard territory. Agreed?

4

5 MR. HARVEY: Miln Harvey for AECOM.  
6 Agreed. Just one quick point. If -- when you take a look  
7 at the Y axis, it should say "hydraulic conductivity  
8 (metre per second)". There -- it just doesn't -- doesn't  
9 contain the unit but it's important to -- to note.

10

11 MR. WILLIAMS: Williams speaking.  
12 And I thank you for that because I was asked to confirm  
13 that. So, I appreciate your proactive answering of  
14 question.

15

16 When we look at the actual figure, the red  
17 circles or dots represent calibrated values. Agreed?

18

19 MR. HARVEY: Miln Harvey for AECOM.  
20 Agreed.

21

22 MR. WILLIAMS: And the dark black  
23 lines with dots at either end represent the range of  
24 hydraulic conductivity?

25

1 MR. HARVEY: Miln Harvey for AECOM. Those  
2 lines represent the historical information that we have  
3 from previous studies which measured these in the field.  
4 So, that includes pumping tests and slug tests. So that's  
5 a limited number of field investigations, and those are  
6 measured values, yes.

7  
8 MR. WILLIAMS: Which leads us to the  
9 light grey lines with dots that you see on that table, and  
10 I wonder if you could explain what those are, Sir?

11  
12 MR. HARVEY: The light grey lines come from  
13 -- oh, Miln Harvey for AECOM -- the light grey lines come  
14 from actual papers. So there's a variety of historical  
15 documents that we went through and -- and also field  
16 testing, and so, each of those is -- is different in  
17 different published information, and then they were  
18 summarized in the big, black lines.

19  
20 MR. WILLIAMS: Just so I'm clear on  
21 the light grey lines, were you suggesting that those are -  
22 - are the results from published papers?

23  
24 MILN HARVEY: Miln Harvey for AECOM. A  
25 combination of historical information, published --

1 published information on -- from different studies, yes.

2

3 MR. WILLIAMS: And how, ultimately,  
4 do you distinguish between the light grey lines and the  
5 dark lines?

6

7 MR. HARVEY: Miln Harvey for AECOM. The  
8 darkest -- the black line is the full range that  
9 encompasses the sum of all of the light grey lines. So,  
10 the light grey lines, when we look at all of those ranges,  
11 they all fall within the black line.

12

13 MR. WILLIAMS: Just to finish this,  
14 and directing your attention specifically to Red River  
15 carbonate, where if you look at from the grey line, 1.E-05  
16 down to 1.E-09, that seems to be beyond the range of the  
17 black line, Sir. And so, I'm looking for an explanation  
18 of that.

19

20 MR. HARVEY: That line comes from Render  
21 1970, and it is a previously published -- published study.  
22 It had -- it got -- the hydraulic connectivity was listed  
23 as, for the Red River carbonate, as going from 1.E-09 to  
24 1.E-06. So yeah, it's on page ---

25

1 UNIDENTIFIED SPEAKER: Cursory Table 5-1.

2

3 MR. HARVEY: Table 5 -- Miln Harvey for  
4 AECOM. Table 5-1, "Summary of Aquifer Properties" for  
5 properties in the Hydrogeological and Geochemical  
6 Assessment report.

7

8 MR. WILLIAMS: Thank you for that.  
9 Wonder if we could turn to Slide 19, which is labelled  
10 "Sensitivity Analysis"? And you may require your reading  
11 glasses for this one. Williams speaking. It's not --  
12 just at the -- if, we're trying to orientate ourselves on  
13 this table, at the very top, we'll see various observation  
14 points. You'll see including 30-10-8E1, et cetera. You  
15 see those?

16

17 MR. HARVEY: Miln Harvey for AECOM, yes.

18

19 MR. WILLIAMS: And those represent  
20 various distances from which observations were made.  
21 Agreed?

22

23 MR. HARVEY: Miln Harvey for AECOM.

24 Agreed.

25

1 MR. WILLIAMS: And what you were  
2 trying to do at a high level in this sensitivity analysis  
3 is simulate drawdowns, whether for the Red River carbonate  
4 or the Winnipeg sandstone carbonate, from a base case  
5 under certain scenarios or assumptions. Agreed?

6

7 MR. HARVEY Miln Harvey for AECOM.  
8 Agreed.

9

10 MR. WILLIAMS: And again for labeling  
11 purposes, let's go under -- towards the bottom of the --  
12 of the chart under "Simulated drawdown in metres in  
13 Winnipeg sandstone", let's go to the first column at 30-  
14 10-8E1 to the base case scenario. Do you see that, Sir?  
15 So base case scenario one, at the first observation point  
16 for the simulated drawdown from Winnipeg sandstone. Do  
17 you have that?

18

19 MR. HARVEY: Miln Harvey for AECOM. Yes.

20

21 MR. WILLIAMS: And that was 7.5  
22 metres. Agreed? For the base case. Williams speaking.

23

24 MR. HARVEY: Miln Harvey for AECOM. For  
25 Scenario 1, that is the 7.5 metres of drawdown in that

1 well for the base case, that is correct.

2

3 MR. WILLIAMS: Williams speaking.

4 And taking you down still at observation point 30-10-8E1,  
5 three more lines, you'll see a -- a sensitivity of  
6 "Carbonate K = Min" in brackets "(one point five times ten  
7 to the minus fifth)" in brackets. Agreed?

8

9 MR. HARVEY: Miln Harvey for AECOM.

10 Agreed.

11

12 MR. WILLIAMS: And in that  
13 sensitivity, taking into account a hydraulic connectivity  
14 taken to its minimum value, the simulated drawdown was  
15 14.3. Agreed?

16

17 MR. HARVEY: Miln Harvey for AECOM.

18 Agreed.

19

20 MR. WILLIAMS: Williams speaking.

21 would it be fair to suggest that in terms of the  
22 sensitivity of the fractured limestone at the top and the  
23 bottom of the carbonate aquifer, that AECOM does not know  
24 that sensitivity?

25

1 MR. HARVEY: Miln Harvey for AECOM. We  
2 used a single layer to represent all of the Red River  
3 carbonate and our sensitivity analysis is a weighted  
4 average across the -- the single unit, yes.

5

6 MR. WILLIAMS: And so, just to be  
7 precise, you don't know the sensitivity for the fractured  
8 limestone at the top of the carbonate, aquifer. Agreed?

9

10 MR. HARVEY: Miln Harvey for AECOM. Yes.

11

12 MR. WILLIAMS: And -- Williams  
13 speaking -- similarly, you do not know the sensitivity of  
14 the fractured limestone at the bottom of the Red River  
15 carbonate aquifer. Agreed?

16

17 MR. HARVEY: Miln Harvey for AECOM.  
18 Similarly, we used a single unit to represent equivalent  
19 force media, hydraulic conductivity of the Red River  
20 carbonate. We did not separate out the basal weathered  
21 zone, correct.

22

23 MR. WILLIAMS: At Page 50 -- Williams  
24 speaking -- of its PowerPoint, AECOM uses the term  
25 "adaptive management". Do you recall that?

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MR. MILLS: Ryan Mills of AECOM. On Page 52, we use the term "adaptive management". And also, on - - on Slide 50 as you point out, correct.

MR. WILLIAMS: Would AECOM describe itself as generally familiar with the academic literature regarding adaptive management? Williams speaking.

MR. MILLS: Ryan Mills of AECOM. I am not a -- an academic researcher on the subject of adaptive management. I have employed adaptive management and contributed to adaptive management plans on numerous projects in the past. So, I have a -- a high level of familiarity with the use of adaptive management on mining projects, but not direct knowledge of academic literature.

MR. WILLIAMS: Williams speaking. And thank you for that. For the purpose of preparing your evidence, or otherwise, would you have reviewed Fitzpatrick et al. "Good development should not end with environmental assessment. Adaptive management in northern development". Is that a -- a peer reviewed literature you're familiar with?

1 MR. MILLS: Ryan Mills with AECOM. No,  
2 that is not something I'm familiar with.

3

4 MR. WILLIAMS: Just one more question  
5 in this vein. Would you have reviewed Fitzpatrick and  
6 Williams 2022 "Impact assessment in Canada strengthening  
7 follow-up monitoring and evaluation" in the "Handbook of  
8 Environmental Impact Assessment"? Is that a peer reviewed  
9 literature you'd be familiar with?

10

11 MR. MILLS: Ryan Mills with AECOM. No,  
12 that is not something I am familiar with.

13

14 MR. WILLIAMS: Our publisher will be  
15 unhappy. To AECOM -- Williams speaking -- are you  
16 generally aware from the literature of the distinction  
17 between what is properly termed adaptive management versus  
18 what is more colloquially called managing adaptively?

19

20 MR. MILLS: Ryan Mills with AECOM. This  
21 is normally the -- the minutiae of terminology around  
22 adaptive management are normally managed by our  
23 environmental assessment team, and I believe they will be  
24 speaking later. I'm not a -- an expert in -- in  
25 distinguishing between the -- those two terms.

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MR. WILLIAMS: But you consider that  
to be minutiae? Williams speaking.

MR. MILLS: Ryan Mills with AECOM. I'm  
not familiar enough to understand the difference between  
those two terms.

THE CHAIRMAN: Chair. Mr. Williams,  
I'll just let you know that you are an hour deep in an  
hour and a half, so I hope your time is proceeding as ---

MR. WILLIAMS: Mr. Chair, I apologize  
for inadvertently cutting you off. I promised I would be  
done in -- before an hour and a half, and I shall be -- be  
done before that.

MS. WEEDEN: Mr. Chair. Sorry. Laura  
speaking. Can I just ask for like, a two-minute break?  
Sorry.

MR. WILLIAMS: We're perfect for  
schedule. We've got lots of time.

THE CHAIRMAN: Chair. By all means.

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(LONG PAUSE)

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THE CHAIRMAN: Chair. So, let's regroup in one minute, please. Chair. We appear to all be back in our seats. So, Mr. Williams, over to you.

MR. WILLIAMS: Thank you. Williams speaking. Mr. Mills, just sticking to "adaptive management" in quotation marks for a second, you understand that adoptive -- adaptive management is not appropriate in circumstances where there remains uncertainty about whether the project is likely to cause significant adverse environmental effects. Do you understand that, Sir?

MR. MILLS: Ryan Mills speaking. Yes, it's my understanding at a high level that the role of adaptive management is to systematically reduce uncertainty around future conditions and constrain that overtime.

MR. WILLIAMS: Just to press my specific question, you understand that it is not appropriate in circumstances where there is uncertainty

1 about whether the project is likely to cause significant  
2 adverse environmental effects?

3

4 MR. MILLS: Ryan Mills speaking. Yeah --  
5 yes, I do understand that.

6

7 MR. WILLIAMS: Williams speaking.  
8 And you'll also understand that it would be inappropriate  
9 to use adaptive management as a measure to compensate for  
10 inadequate baseline information. Agreed?

11

12 MR. MILLS: Ryan Mills speaking. I  
13 believe adaptive management is separate from baseline  
14 data. You don't necessarily need hard data to  
15 characterize the possibility of impacts in all cases. So,  
16 I -- again, I'm not an expert in adapt -- the subject of  
17 adaptive management itself and -- and I'll refrain from  
18 speaking about it further.

19

20 MR. WILLIAMS: Thank you for that.  
21 And Mr. Chair -- Williams speaking -- subject to a  
22 consultation with my colleague, that may be the end of our  
23 cross-examination on time. yet again.

24

25 THE CHAIRMAN: Chair. Much

1 appreciated. I will wait to hear back from you.

2

3 MR. WILLIAMS: Mr. Chair, with thanks  
4 to the panel, I'm -- I'm seeing some hand gestures from  
5 all over the panel, so they may want to complete an  
6 answer.

7

8 UNIDENTIFIED SPEAKER: Thank you. We would  
9 just ask to clarify one of our earlier points on -- on the  
10 shale and I'll turn it to my colleague Dr. Elemine, if  
11 that's permissible?

12

13 MR. WILLIAMS: Williams speaking.  
14 That's not up for me, but I have no objection to them  
15 returning to their answer.

16

17 MR. OULD ELEMINE: Cheibany Ould Elemine,  
18 AECOM. In a previous question related to the use of  
19 fixing our water quality assessment, we were asked to  
20 indicate whether we included the shale in our simulation.  
21 We looked at two different scenarios. One of them is the  
22 mixing between the carbonate and the sandstone aquifer,  
23 and we did not include the shale in that simulation  
24 because the shale is not an aquifer. But when we looked  
25 at the possibility of oxygen introduction into the

1 subsurface, we included all the three units, the carbonate  
2 unit, the shale unit, and the sandstone. I hope that's  
3 clarify -- answer correctly your question.

4  
5 MR. WILLIAMS: Williams speaking. I  
6 don't think I needed that clarification, but I just want  
7 to make sure that I have the answer that I had previously.  
8 The effect of release of shale pore water via collapse of  
9 the shale aquitard into sandstone was not considered in  
10 the PHREEQC model. Agreed.

11  
12 MR. OULD ELEMINE: The volume of pore  
13 water -- Cheibany Ould Elemine, AECOM -- the shale unit is  
14 an aquifer -- aquitard by definition. So, the volume of  
15 water that is stored in an -- in that unit is very, very  
16 minimal -- negligible compared to the volume of water in  
17 the carbonate unit and the sandstone unit.

18  
19 MR. WILLIAMS: Williams speaking.  
20 And just to finish the thought, it would be your  
21 expectation that within that shale pore water, there would  
22 be some chloride. Agreed?

23  
24 MR. OULD ELEMINE: Cheibany Ould Elemine,  
25 AECOM. Agree.

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MR. WILLIAMS: Williams speaking. I do want to thank the panel for responding to our questions, and on behalf of our clients, we're very appreciative that I was able to appear today when my schedule did not allow me to yesterday. So, thank you very much.

THE CHAIRMAN: Chair. Thank you very much. We endeavour to accommodate to the extent possible. So thank you for your questions. Thank you to the panel. Okay, let's try and do a little time management here. We have the, what we're nominally calling the permitting water treatment and business panel, to be sworn in. What is the -- what is the duration of that presentation?

MR. DUNCANSON: Mr. Chair, Sander Duncanson. I believe it's approximately 45 minutes.

THE CHAIRMAN: Chair. Thank you very much. Dennis, how long do you -- do you anticipate you will be questioning? I don't think that's going to be possible, so would you like to pick another number? I don't think that's going to be possible either. Would you like me to give you a number, Sir? 30 minutes. Chair.

1 Thank you. Rural Municipality of Springfield, how long do  
2 you anticipate, if at all, questioning our next set of  
3 experts? Sorry, I can't hear that. Thank you very much.  
4 For the transcriber, the answer was they are not planning  
5 on questioning. OLS? Three minutes. MSSAC? And MBEN?

6

7

UNIDENTIFIED SPEAKER: twenty minutes.

8

9

THE CHAIRMAN: Chair. So, that adds  
10 up to less than three hours. I'll tell you where I'm  
11 going with this. MSSAC has asked for an additional 15  
12 minutes of questioning of the panel that is currently  
13 sworn in, and you have permission to proceed.

14

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MR. DUNCANSON: Mr. Chair, Sander  
Duncanson. I am a little concerned about just the  
precedent that that might set, that parties have the  
ability to ask one round of questions, and then give it  
some thought, and hear what others have to say and then  
essentially get a second -- second kick at the can.  
That's not typically how these hearings work because other  
parties would then be expected to have the same  
opportunity in the future. So, I just -- recognizing that  
you've granted the request, just wanted to put that  
comment on the record, that -- that now does potentially

1 (audio cut) ---

2

3 THE CHAIRMAN: Chair. My apologies.  
4 We'll start in two minutes.

5

6 (LONG PAUSE)

7

8 THE CHAIRMAN: They are.

9

10 UNIDENTIFIED SPEAKER: (inaudible).

11

12 THE CHAIRMAN: No. Not from that  
13 position, no.

14

15 THE CHAIRMAN: The technology will  
16 inevitably fail you.

17

18 UNIDENTIFIED SPEAKER: (inaudible).

19

20 THE CHAIRMAN: Chair. Perhaps we  
21 should just refer to the figure number then if we can't  
22 get it up. We can get the panel to perhaps even pull it  
23 up.

24

25 MR. GILLIES: Ian Gillies, Commissioner. I

1 have a question related to one of the figures that we  
2 looked at yesterday. It has to do with the mean radius of  
3 the cavern operation. Peter, can you sort of cite the  
4 coordinates so that the panelists can -- oh, they've got  
5 it. Okay, super. So, my question is on scale effects  
6 that may occur as a result of the progression of the  
7 cavity size and volume. You know, I think what we've  
8 heard so far from this panel. Is some evidence that is  
9 relatively static in nature because of when tests were  
10 taken from the -- from the cavity -- from the extraction  
11 water, and how the models were interpreted. But I'm --  
12 I'm kind of interested in as -- as we go forward in time,  
13 and this -- this figure that's up on the screen shows the  
14 progression of the cavity size between operations three  
15 and four, we see that it has expanded in size, and I think  
16 we can probably assume, in a dynamic situation, that the  
17 cavity will continue to expand in size as the side of the  
18 sandstone walls collapse. So, as that happens, there --  
19 there will be more degradation of the shale layer and the  
20 limestone aquifer into the void. So, my question really  
21 is, based on your knowledge of the dynamics of the water  
22 quality, the interchange of water between the aquifers,  
23 the characteristics of the shale layer, whether there may  
24 be scale effects as the cavity expands? And would you  
25 believe that it would be prudent to take further samples

1 from the cavity to determine if there is any release of  
2 mineralization from the shale layer as more and more of it  
3 collapses into the -- into the void? What is your opinion  
4 on that? Thank you.

5  
6 MR. MILLS: Ryan Mills with AECOM. Thanks  
7 for the question. And a couple of components to that,  
8 that I'll just breakdown. So first off, the -- the rate,  
9 magnitude, timing of expansion of any voids, I believe is  
10 best addressed by the geotechnical engineers in the room  
11 and I -- I think that that was covered. And sort of  
12 recognizing it, when we initiated the groundwater  
13 modelling, we didn't actually have a firm footing on the -  
14 - the lateral extent of the, you know, area where that --  
15 that shale may degrade. So, we applied our professional  
16 judgment and -- and kind of wanted to make sure that we  
17 were conservative, and so, we assigned a radius of 200  
18 metres around each extraction well cluster, which as it  
19 turns out was probably far too conservative. You know  
20 we've -- we've heard that the magnitude and extent of that  
21 shale collapse would be much smaller. So I -- I think  
22 that by taking that conservative approach and starting  
23 with an overly large, assumed extent of the shale  
24 collapse, that we've encapsulated, you know the what --  
25 what we thought was the possible evolution of the -- the

1 magnitude of the shale, you know to be 200 metres around  
2 each extraction well cluster. But it's -- it's, in turn,  
3 going to be much smaller. So that's -- that's the sort of  
4 first component on scale effect, I believe.

5  
6 The second is that the vertical sort of --  
7 like, when we as -- as geologists, and hydrogeologists,  
8 and geochemists, we will start with conceptual models and  
9 -- and those kind of are informed by sort of an  
10 understanding of the geological environment. And in this  
11 case, it is a -- a sedimentary depositional environment.  
12 And we know that those environments, you know, in a -- in  
13 an ocean or in a marine setting, are typically laid down  
14 as laterally extensive and relatively uniform materials  
15 over typically large areas. And so, it allows us to make  
16 inferences about the -- the spatial extents of those units  
17 and constrain the variability that we might expect over  
18 different scales because they were, in turn, deposited  
19 under similar geological environments. And so, that is an  
20 important tool and that -- that's why we start with a  
21 conceptual model that is informed by a literature review  
22 and an understanding of the geology, because it -- it all  
23 comes from the geology. And -- and then we use that  
24 conceptual model as a hypothesis testing framework. And  
25 so, we systematically reduce our uncertainty by putting

1 holes in the ground, conducting tests, collecting samples,  
2 and doing subsequent analysis, whether it be in a -- in a  
3 numerical framework or otherwise. And so the -- to get to  
4 your, I believe, your last point was -- or question, was  
5 around the temporal aspect of the project. And so, that  
6 was directly evaluated with the numerical model and to  
7 show how -- how groundwater levels and vertical gradients  
8 now with the -- the information that we've provided this  
9 morning, may change over time. And we see that the -- the  
10 exchange is primarily during operations. Before -- right  
11 now, there's very little exchange in the far future and --  
12 and in between each year of operations, there would be  
13 very little exchange. During operations, we've simulated  
14 that there may be some downward flux if the shale is not  
15 present. And so, it would be a short-term phenomenon for  
16 a period of days to weeks that that exchange would occur  
17 until the hydraulic gradients and the primary driving  
18 force for exchange of waters would -- would diminish, and  
19 -- and essentially be similar to what it is now, with very  
20 little exchange between the two systems. Did I capture  
21 everything?

22

23 MR. GILLIES: Yes, thank you. Just one  
24 follow-up question just to simplify it for me. Ian  
25 Gillies, Commissioner. Would there be -- would you expect

1       there to be any water quality impacts of water in the void  
2       and -- and spreading from the void, from a -- a scale  
3       effect of say, 200 metric tonnes of shale collapsing into  
4       the void versus 2,000 metric tonnes of scale collapsing  
5       into the void?

6  
7                   MR. MILLS:    Ryan Mills with AECOM.    We --  
8       you know we -- and I -- I do realize that I missed  
9       answering that in my first response -- but the -- so, we  
10      do understand the flushing behaviour of -- of the  
11      materials and -- and their potential, you know, elements  
12      that could be released based on some fairly aggressive  
13      testing.    We expect the magnitude of change to be very  
14      small to negligible.    But -- and this is one of the -- the  
15      reasons for the recommendation of -- of implementation of  
16      a -- a groundwater monitoring and mitigation plan is -- is  
17      to validate the results of our assessment that we  
18      presented.    And -- and you know, directly measure --  
19      measure it and -- and really you can only do that at -- at  
20      scale, you know in a -- in an efficient way.

21

22                   MR. GILLIES: Thank you.

23

24                   THE CHAIRMAN:            Chair.    Thank you very  
25      much.    I believe we are done with this panel now then at

1       this time.    So let's proceed to affirm Clifton, Marlene  
2       and Mohsen.

3  
4                   Chair.    So, while they're setting up, I'll  
5       just, for the record, remind what our terms of reference  
6       were, particularly the first bullet.    The CEC will conduct  
7       a technical review of the *Environmental Act* proposal, the  
8       Hydrogeology Geochemistry Assessment Report, and provide  
9       advice and recommendations to the Minister regarding  
10      potential environmental and health effects of the proposed  
11      sequential installation, operation, and decommissioning of  
12      silica sand extract wells for the silica sand extraction  
13      project.    To date, we have heard from the geotechnical  
14      group, the hydrogeology group, and the geochemistry group,  
15      and this group basically wraps around everything that  
16      doesn't fall within one of those three.

17

18                   Chair.    Mr. Secretary, are we good to go?

19

20                   SECRETARY:    Secretary.    So, we'll go on  
21      with affirming the -- the next panel, if you guys can just  
22      go down the road and just state your name for the record,  
23      please.

24

25                   MR. BARKH:    Mohsen Barkh.    I do.

1

2

MR. SAMOILOFF: Clifton Samoiloff.

3

4

MS. GIFFORD: Marlene Gifford.

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9

SECRETARY: Do you, Mohsen, Clifford, and  
Marlene, solemnly affirm that the evidence that will be  
given by you shall be the truth, the whole truth, and  
nothing but the truth?

10

11

MR. SAMOILOFF: Yes.

12

13

MR. BARKH: Yes, I do.

14

15

MS. GIFFORD: Yes.

16

17

SECRETARY: Thank you.

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25

THE CHAIRMAN: Chair. So, I  
understand you need about 45 minutes, so, I will start the  
clock and over to you.

MR. SAMOILOFF: Yes, thank you, Chair.  
Good morning, Chair, commissioners, participants, gathered  
members of the public. I'm sorry, Cliff Samoiloff

1 speaking. That'll be the last time I miss it. I'm Cliff  
2 Samoilloff with AECOM. Thank you for the opportunity to  
3 present this morning. I trust that there'll be a -- a  
4 very good exchange of information and we look forward to  
5 answering any questions. Sorry. Can everybody hear me  
6 okay? So on this panel, we will speak to issues of  
7 permitting, water treatment, and business. We will start  
8 with -- with Mohsen, to my left. Just a reminder to the -  
9 - to the participants and the -- and the public, this will  
10 be an opportunity to speak to Sio on matters related to  
11 the business as per the presentation they provided on day  
12 one. And we will also address questions related to the  
13 environmental permitting and all the studies that -- that  
14 went into that. So, I'll turn it over to Mohsen to start  
15 with water treatment.

16

17 MR. BARKH: Mohsen with Recens. I'm a  
18 professional engineer with more than 25 years ---

19

20 THE CHAIRMAN: chair. I'm sorry to  
21 interrupt. I'm gonna need you to lean into the microphone  
22 because I'm having trouble hearing you. So, please speak  
23 up. Don't be shy. Let's do it.

24

25 MR. BARKH: Mohsen speaking. I am a

1 professional engineer with Recens with more than 25 years  
2 experience in the mine water and wastewater treatments. I  
3 work in 17 different countries, and I work with a variety  
4 of the contaminated water. And I am here to basically  
5 explain the design that we did for the Sio Silica and the  
6 basis that we work on for that one.

7  
8 The water treatment basically that we -- we  
9 try to discuss here, we mentioned that what -- basically  
10 how will be the groundwater extracted from the sand,  
11 returned to the aquifer, which organic component we will  
12 use, and what is the -- what else the organic component  
13 going to do, and is it the safe component for our usage,  
14 and will be organic -- how we will use that organic  
15 component.

16  
17 Just I want to bring to everybody's  
18 attention that when I was asked to design this system, I  
19 was asked to design the system to be able to return the  
20 water to the aquifer with the same quality or better  
21 quality, and also the agile and adaptable units, or  
22 treatment facility that can meet future requirement if  
23 there's any. So, the basis of our design was using a  
24 natural polymer that we call the chitosan and then the  
25 system by itself's known as the Chitosan Enhanced Sand

1 Filtration or CESF units. The base of the work is the  
2 water with some fine and suspended silica comes to our  
3 tank first. We add a version of the chitosan to the  
4 material to remove the coarse material and the bulk of the  
5 suspended material. We send the water to a clarifier and  
6 give it enough time to have retention for the suspended  
7 solid. The overflow from the clarifier goes back to the  
8 system again and yet another type of the chitosan will be  
9 added. The second one basically had the property to  
10 adsorb and attach all the fine material together and had a  
11 very good affinity to the sand. So, the treated water, or  
12 mixed water with the second type of the chitosan goes to  
13 the sand filter and basically sand absorbs all the  
14 chitosan and affiliated fine and suspended solids. And  
15 then at the end, we do a quality control. In the quality  
16 control, if the water meets the requirement, the water  
17 goes for the discharge or return to the aquifer, if we  
18 didn't meet the requirement or quality that we expected,  
19 we send it back to the beginning of the process.

20

21 Just to give you an idea that system has  
22 three-point of the quality control. At the very  
23 beginning, we do some measurement to decide how much  
24 material you have to add. The overflow coming from the  
25 clarifier -- will be monitored for the second time. And

1 the last monitoring happen before discharging the water.  
2 The system that we design has an automated controlling  
3 system and every five to 15 minute, we measure all the  
4 parameter in the system. So, and at the very end, if  
5 still we are not happy with the result, we return it back  
6 to the beginning of the process.

7  
8 A little bit of information about the  
9 chitosan. Chitosan is a natural polymer coming from the  
10 shrimp, and crab, and lobster shell. Hundred percent  
11 biodegradable. And basically there is no -- there is no  
12 negative -- no impact of the chitosan in the environments.  
13 Chitosan has a very good affinity to the fine material and  
14 basically used in many industry for not only water  
15 treatment, but for using as a shell for the capsule for  
16 the artificial bone and things like this, in the -- in the  
17 different industry. So, it's very well-established  
18 material in the medical industry and in the water  
19 treatment and food industry.

20  
21 A little bit of facts about the system that  
22 we designed. Basically, the chitosan's designed to -- to  
23 capture the particle in the water. However, if there is  
24 no particle or there is no use for the chitosan, chitosan  
25 become insoluble in the pH between six and nine, which is

1 the normal pH for the drinking water and for the aquifer  
2 water, and basically precipitates by itself. So, there is  
3 no chance of the -- having residual unused material or  
4 unutilized material in our system.

5  
6 Besides removing the particle, chitosan has  
7 the ability to remove the metal and some hydrocarbon. So,  
8 this is another advantage of the -- using the chitosan.  
9 The quality of the water is 100 percent safe and basically  
10 repeatable. We can have this process several time.

11  
12 Just as some additional information,  
13 chitosan is the only authorized polymer that can be used  
14 in the municipality of the -- Burnaby in BC, in Port  
15 Coquitlam, and in many other municipalities. Also, that  
16 is the only authorized materials to be used on site C for  
17 this process for precipitation as the flocculent, and in  
18 the Trans Mountain project. So, all basically approved by  
19 the Ministry of the Environment in BC, and as well as  
20 Washington State and California.

21  
22 Just a few things that I want to mention  
23 about the sand filter. I mentioned that we have a sand  
24 filter at the end of the process. The sand filter  
25 normally can remove material up to 20 microns, but if we

1       come to the point that we need to remove finer material or  
2       additional material, we can technically change the sand  
3       filter to multimedia filter by changing the material  
4       inside the sand and bring it down to five microns. Also,  
5       the system has an ability and agility to have more units  
6       at the end such as back filter, carbon filter, and  
7       cartridge filter to basically reduce the size of the  
8       particle that we see from the system. The whole system  
9       that we design here is supposed to work as a pre-treatment  
10      for the UV system to remove any potential particle in the  
11      system and maximize the efficiency of the UV system in our  
12      operation in our treatments. Also, as I was basically  
13      tasked to do, the system is totally adaptable for the  
14      future change. For example, if we see hydrocarbon, or  
15      metal, or something like this, this system that -- has  
16      ability to receive another module after that to do more  
17      work for water treatment. So, we are very confident that  
18      system is 100 percent safe and can meet all the  
19      requirements of the treatment here.

20

21                   By this, I pass to Cliff Samoiloff for  
22      permitting project.

23

24                   MR. SAMOILOFF:        Thank you, Mohsen.

25      So, I'll speak a little bit to project permitting. The

1 topics that -- that we'll address are number -- well,  
2 first off, we'll -- we'll introduce the AECOM team that's  
3 on the panel, myself and Marlene. We'll speak to the  
4 overall permitting process, a question that came up during  
5 the public review comments, as well as some of the IRs  
6 regarding why two separate projects for Sio. We'll speak  
7 to the *Environment Act* licence application and why we've  
8 only applied for the first four years. We'll have a  
9 discussion on cumulative effects assessment and then the  
10 next steps.

11

12 So, I'm going to apologize in advance. The  
13 permitting slides are notoriously boring. There's no  
14 graphs, there's no figures. There's two pictures and --  
15 and one of them is me. So, I do apologize that there may  
16 not be a lot of those pretty pictures, but we'll -- we'll  
17 try to make it as interesting as possible.

18

19 So, myself -- sorry, Cliff Samoiloff, I  
20 will not do that again -- I'm a project manager in the  
21 Winnipeg office. Full disclosure, I am -- I am not an  
22 engineer. We've heard from a lot of professional  
23 engineers and professional geologists over the past few  
24 days. I am a scientist. I have a degree in microbiology,  
25 as well, I'm a professional practitioner, environmental

1 practitioner through Eco Canada. I'm a project lead and -  
2 - and provide senior technical support on a variety of  
3 environmental projects, most of them focused in the mining  
4 sector, but also other industrial work, manufacturing,  
5 open paper, chemical, food and beverage, and  
6 transportation. I have 28 years of experience primarily  
7 in environmental assessment, but also the areas of  
8 environmental toxicology and chemistry, EHS management --  
9 that's environment, health and safety compliance --  
10 environmental management and -- and stakeholder  
11 engagement. I'm also a -- a certified environmental  
12 auditor. And then some of my professional affiliations  
13 are -- are identified in this slide as well.

14

15 So, before I move forward with my  
16 presentation, we'll just introduce Marlene as well.

17

18 MS. GIFFORD: Good afternoon. I think this  
19 is afternoon. I'm Marlene Gifford and thank you, Cliff.  
20 I'm a biologist and environmental assessor with AECOM. My  
21 specialty is in environmental permitting, but also  
22 terrestrial and aquatics systems. And I'm a biologist  
23 supporting various market sectors such as mining,  
24 minerals, renewable energy, manufacturing, transportation,  
25 and linear infrastructure, and water control. So, I have

1 over 28 years of experience in doing environmental  
2 assessments and permitting, terrestrial and aquatic  
3 studies, and also some public and Indigenous engagement.  
4 I'm a professional biologist registered in Alberta and  
5 also in British Columbia. And I've done some training  
6 when the opportunities come up, like the advanced training  
7 in February 2020 for the federal *Environmental Impact*  
8 *Assessment Act*, a two-day intensive workshop with  
9 Fisheries and Oceans Canada in 2015, and a cultural  
10 awareness workshop for the Keeyask Generating Station.

11

12 MR. SAMOILOFF: Thanks, Marlene. So,  
13 to start things off, I'm going to flashback to some slides  
14 that Siobhan, from the Environmental Approvals Branch,  
15 discussed earlier this week, I think on day one. It's not  
16 her slides directly, but the information that was  
17 contained in her slides, that's with respect to the  
18 *Environment Act*. So the *Environment Act* outlines the  
19 environmental assessment and licensing process for  
20 developments in Manitoba that may have potential for  
21 significant environmental and/or human health effects.  
22 I'll highlight the words "development". I'll get to that  
23 in some slides a little bit later. The licensing process  
24 exists to ensure primarily three things, environmental and  
25 human health protection, encourage and allow for early

1 public participation, I'll highlight the word "early" in -  
2 - in this sentence as well, and to ensure economic  
3 development occurs in an environmentally responsible  
4 manner. So, not every business, industry, facility  
5 requires an *Environment Act* licence. There are certain  
6 defined developments that do need to go through the  
7 licensing process, and I'll get into that a little bit  
8 later in the presentation. But certain developments must  
9 apply for and receive an *Environment Act* licence prior to  
10 construction and operation.

11

12 The classes of Development Regulation  
13 Manitoba Regulation 164/88 lists the type of projects  
14 which are defined as developments. There's -- there's  
15 three classes of developments underneath the regulation, a  
16 Class 1, a Class 2, and a Class 3. Class 1 can loosely be  
17 defined as a facility that is -- and we'll call it, small  
18 or less complex, whereas as we go to a Class 3 facility,  
19 that would be what we would consider a larger or more  
20 complex project -- could include multiple buildings,  
21 multiple facilities that interact with each other, or  
22 cover a fairly large footprint. Whereas, a Class 1 is --  
23 is typically smaller. And again, those are very broad  
24 definitions just for the purpose of putting it into  
25 context.

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Metal mines and processing facilities in Manitoba are normally considered a Class 2 development under the regulation. There are exceptions, but they're rare exceptions. Most mining and metal processing facilities are Class 2 developments, which as I have somewhat defined, must undergo an environmental assessment and licensing process and receive the *Environment Act* licence prior to construction and operation. So, in order to get a licence you apply -- you submit an *Environment Act* proposal which we will sometimes call an EAP in this presentation, and the environmental assessment and the associated studies feed into that EAP.

Just to briefly discuss the environmental approvals process for the Sio projects, and it's following the Government of Manitoba's environmental approvals process. In July of 2020, Sio submitted an EAP for the facility project. They filed their application, they went through the mandatory review periods as mandated by the *Environment Act*, and it was subject to public review. That basically allowed time for the general public to review the EAP and the associated documentation and provide questions via a formal question period, in which Sio was then required to respond to those questions. It

1 went through the environmental public review process and  
2 an *Environment Act* licence for the facility was issued in  
3 December of 2021. In July -- sorry, yeah -- sorry,  
4 December 16th, 2021. In July of 2021, the extraction  
5 project had completed its EA process and an EAP was  
6 submitted in July. It, too, went through the formal  
7 public review process, which included meetings and then  
8 the formal question and answer via the government process.  
9 And as an additional measure of public input and technical  
10 review, we're currently sitting in this CEC process, which  
11 is expected to last for a couple more weeks. In 2023,  
12 there's a -- we expect that the extraction project  
13 *Environment Act* licence would be issued and then no  
14 construction would begin until that licence is received.

15

16 As you see on the bottom, there's a yellow  
17 arrow that speaks to the ongoing public engagement  
18 process. There has been continual public engagement along  
19 the way for both projects and that continues to this --  
20 this day, today.

21

22 So, I've mentioned the EAP, and the other  
23 thing that I want to bring to everybody's attention  
24 regarding an EAP is it is a document that is submitted  
25 relatively early in the project life cycle, and there's a

1 reason for that. I've referred to early public  
2 participation in one of my previous slides, and by  
3 submitting an EAP early in the process, it allows for time  
4 for the public and the Technical Advisory Committee, which  
5 is a -- a body of specialists that work within the  
6 government, to review the information that's provided in  
7 the *Environment Act* proposal. So, that would be the  
8 project description, any baseline studies that have been  
9 done, and any of the environmental assessment work, okay.

10

11 The information and data required to  
12 complete an EAP is much different than the data that would  
13 be required for what many people consider as detailed  
14 design, or finalization of management plans that guide  
15 construction and operation of a project. So, early  
16 development allows for that review and public input, and  
17 then the subsequent studies is important information that  
18 feeds into the mitigation plans, and as well as the  
19 licence conditions. So, information that's gathered in an  
20 event like today is information that is used to help to  
21 refine those management plans to ensure that, you know,  
22 impacts are mitigated to the extent possible. That being  
23 said, with the EAP being completed early in the process,  
24 we are still reliant upon information that allows the  
25 environmental assessment team to make judgments regarding

1 the potential environmental effects of a project. So, the  
2 level of study that was completed at the EAP stage for  
3 this project was very similar to the level of study that  
4 would have been completed for other mining projects that  
5 have been permitted by the province and that licences have  
6 been granted.

7  
8 As the design process and associated  
9 studies progress, information that is collected, is  
10 considered in the development and operating -- in the  
11 development of operating procedures and monitoring and  
12 mitigation plans. Okay. So, the information obtained  
13 after filing an EAP further supports the EAP and allows  
14 for the development of operating procedures and mitigation  
15 and monitoring plans. This data also helps to identify  
16 conditions that should be included within an *Environment*  
17 *Act* licence.

18  
19 So, for mining projects, there's also a --  
20 a second level of regulatory input and information that is  
21 required, and that is the submission of a closure plan.  
22 So, for mining projects, the design process and associated  
23 studies will also support the development of a closure  
24 plan and associated closure costs and financial assurance.  
25 So, the closure plan is described in detail under the



1 the mining or extraction process permitted separately from  
2 the processing facility. And there's a couple of -- of  
3 reasons why that's the case. Facilities are considered  
4 manufacturing. Mining projects are considered mines.  
5 Facilities are typically permanent components. They have  
6 a longer life cycle. They could be in place for many,  
7 many decades. Whereas, mining projects may have minimal  
8 or no components and generally have a shorter life cycle.  
9 The timeline to construct the facility in this case is  
10 much longer than the timeline that would be required to  
11 actually develop the extraction activities. The timeline  
12 to mobilize the temporary components, and drill and  
13 decommission wells, is much shorter. Another reason is  
14 the projects are both -- can both operate independently.  
15 So, for the processing facility, the project is  
16 potentially viable on its own without the nearby sand  
17 extraction project component. So, in other words, the  
18 sand could be sourced from elsewhere, and Manitoba has a  
19 very long history of sand extraction and manufacturing.  
20 There's many -- many areas where -- where sand could be --  
21 could be collected from. As far as the extraction  
22 project, again, it could potentially be viable on its own  
23 without the nearby sand processing facility. So, sand  
24 could be transported and processed at a different  
25 facility. That being said, however, it's the intention

1 under Sio's current business plan that they would own and  
2 operate both projects.

3  
4 Another question that's come up is why an  
5 *Environment Act* licence application for only four years?  
6 Okay, and the rationale for that is the ongoing monitoring  
7 during the initial operation years, will inform extraction  
8 well locations for the next four years. So, the  
9 information that's gathered during the first four years of  
10 operation will help to refine the process as you move  
11 towards the next four years of operation. The collection  
12 of data, the refinements to the actual drilling and  
13 extraction process, will help to refine the project going  
14 forward.

15  
16 Another important reason is that land  
17 ownership and land use may change during the proposed 24  
18 year life for the project. That's an important point  
19 because you really can't plan where you're going to be  
20 extracting from, definitive locations, unless you know  
21 that you have access to that property. It makes it  
22 difficult to assess longer term if you don't have a sense  
23 of what your footprint is going to be. So, in -- in many  
24 ways it's -- it would be a little bit more challenging,  
25 and maybe not appropriate, to assess a project over a 24

1 year period when some of those, you know, exact locations  
2 haven't fully been refined.

3  
4 This has been mentioned previously, but the  
5 extraction technology may be refined and advanced over the  
6 years, which could potentially influence the number of  
7 locations where wells are being extracted. So, in other  
8 words, the number of wells that may be required in order  
9 to extract the material may be much less 10 years from now  
10 than it is now due to refinements in the methodology.  
11 There are also -- there's also potential for, you know,  
12 upgrading equipment from -- from diesel to electrified,  
13 which would also have an impact on -- on the potential  
14 effects of the project on the environment. And in  
15 addition, the environmental approvals branch,  
16 environmental protection requirements may change in future  
17 years and are better reflected in successive four-year  
18 *Environment Act* licences as opposed to a full 24 years.

19  
20 Cumulative impacts assessment, and why was  
21 this not part of the project review? When we prepare an  
22 EAP, we follow the "Environment Act Proposal Report  
23 Guidelines" that are prepared by the Province of Manitoba,  
24 which applies to all EAP's, and it does not require the  
25 completion or include the completion and inclusion of a

1 cumulative effects assessment. Cumulative effects  
2 assessment are most relevant for large projects with  
3 residual effects after mitigation, that when combined with  
4 impacts of past, present, and reasonably foreseeable  
5 future activities, and natural processes, can potentially  
6 have a substantive adverse environmental effect. So, in  
7 other words, a large megaproject like a hydro dam and  
8 transmission line, which has a much larger footprint, more  
9 inputs, more construction requirements. In that -- in a  
10 case like that, it -- it may be more appropriate to  
11 actually determine what the longer-term impact is, because  
12 it is a permanent project, as opposed to the extraction  
13 project which is temporary. That being said, aspects of  
14 the cumulative effects assessment were considered in the  
15 hydrogeology studies, and we've heard a little bit about  
16 that today. The presence of historical and existing  
17 wells, and the impact on existing users, was considered.  
18 A diverse range of groundwater usage, including domestic,  
19 industrial, irrigation, and livestock was considered. The  
20 expanded spatial scope of the project, so the 24-year  
21 project life, was considered in the -- in the assessment.  
22 And the impact of pumping and development on the aquifer  
23 structure was -- was also a consideration.

24

25

So what's next? We are currently sitting

1 here in the Clean Environment Commission hearing, which  
2 will conclude in a couple of weeks. The CEC will then  
3 have 90 days to review, and prepare, and submit a report  
4 with recommendations to the Minister. So, with that  
5 timing, it takes us into June of 2023. And then the  
6 Minister will consider recommendations and may issue an  
7 *Environmental Act* licence with conditions -- anticipated  
8 within Q3 of -- of 2023.

9

10 With that, I'll hand it over to Marlene  
11 Gifford.

12

13 MS. GIFFORD: Thank you, Cliff. I'll try  
14 not to talk too loudly. Marlene Gifford, AECOM. So, I'm  
15 going to discuss the update to the *Environment Act*  
16 proposal, the revised extraction plan, and I'll review the  
17 progressive closure and rehabilitation activities that are  
18 a part of the project.

19

20 Just a reminder of where the location of  
21 the project site is, in the RM of Springfield, east of  
22 Winnipeg. That red outline that you see there is the  
23 project site boundary that was assessed in the *Environment*  
24 *Act* proposal.

25

1                   Sio submitted a revised extraction plan on  
2           January 24th of this year, and the proposed extraction  
3           plan revisions included overall number of wells being  
4           reduced by about 401 wells compared to the original  
5           extraction plan. The number of wells in each well cluster  
6           has also been reduced from seven, to a variable number of  
7           wells, but less than six. But that depends on the cap  
8           rock thickness of the extraction area. The project site  
9           boundary of the revised plan is located a short distance,  
10          and actually overlaps, with the original project site  
11          boundary that was assessed in the EAP. The overall new  
12          project site area is slightly smaller than the originally  
13          proposed project site area that was assessed in the EAP.  
14          So, these maps illustrate the yellow boundary for the  
15          original project site boundary assessed in the EAP. The  
16          orange boundary is the project site boundary for the  
17          updated environment project site. And that last one to  
18          the far right, there I've overlapped both of the  
19          boundaries, just so you can understand the spatial scope  
20          and distance of the updated -- the project site boundary,  
21          that areas in black are now excluded from the updated or  
22          revised project site boundary.

23

24                   So, in terms of the closure steps, after  
25          the sand is extracted, complete -- is completed at a well,

1 the extraction piping will be removed, and the well will  
2 be sealed to prevent any vertical movement between the  
3 aquifers. An important part of this project is the  
4 progressive annual rehabilitation of any of the  
5 temporarily disturbed areas. And those details were  
6 provided in a closure plan that Sio just submitted this  
7 week to the Mines Branch for review, so, that has already  
8 been submitted. Disturbed areas will be allowed to  
9 revegetate naturally and will be augmented using approved  
10 native seed mixtures and native plantings if required.  
11 That being said, the landowner will have input into the  
12 revegetation planning of the -- of these sites that have  
13 been disturbed. Now, revegetation monitoring will occur  
14 for up to approximately five years, because that's about  
15 the amount of time that it'll take to ensure that the  
16 vegetation is becoming well established and will continue  
17 to grow on its own. Now, as part of the revegetation  
18 monitoring program, there will be an assessment of weed  
19 growth. So, if any excessive weed growth is occurring,  
20 Sio will use Manitoba approved applications to control  
21 excessive weed growth at the site.

22

23 Now we'll discuss the update of the  
24 environmental assessment -- review the environmental  
25 components that were assessed. I'll compare the previous

1 project site with the updated project site in terms of the  
2 existing environment. I'll review the environmental  
3 mitigations and the overall assessment summary. And I'll  
4 discuss the environmental protection plans and monitoring  
5 that will be part of this project. So, these are all the  
6 environmental components that were assessed as part of the  
7 environmental proposal, and also reassessed as part of the  
8 updated extraction plan. So, this past week, our geology  
9 experts and our groundwater experts presented the  
10 information in separate presentations, so we won't discuss  
11 those here.

12

13 So, for the revised extraction plan area,  
14 it's very similar to the area that was assessed in the  
15 EAP. The amount of existing disturbance on the project  
16 site is very similar -- the old project site being 44  
17 percent disturbed in some way, and the new project site is  
18 43 percent. So, I wanna emphasize that the project site  
19 does have a -- quite a lot of existing disturbance to the  
20 land. For both of those project sites, there's no fish  
21 habitat, there's a few dugouts on some parcels of land  
22 used for agricultural operations, but no fish habitat.  
23 There is a bit more forested land on the new project site,  
24 51 percent compared to the old project site which is 45  
25 percent, however, the same mitigation measures will be

1 applied and those being minimizing vegetation clearing to  
2 the extent feasible. There'll be a revegetation program  
3 implemented and importantly, no clearing during the  
4 breeding bird season to affect bird -- migratory bird  
5 species.

6  
7 In terms of heritage resources, there was a  
8 heritage resource impact assessment done on the original  
9 project site, so the results of that assessment was that  
10 there was no significant historic resources found on the  
11 original project site. That being said, with this revised  
12 project site boundary, we will be submitting that boundary  
13 to the Historic Resources Branch, and they will assess  
14 whether an archaeologist is required to go back to the  
15 site to determine if there are any potential significant  
16 historic resources at the revised project site area. So  
17 Historic Resources Branch will make that determination, if  
18 that's required. And if that is required, an  
19 archaeologist would have to go back to the site, under  
20 snow-free and frost-free conditions of the soil so a  
21 proper assessment can be done.

22  
23 There's a lot of information on this slide,  
24 but what I want to say and speak to this in slide is -- is  
25 that the conclusions that were presented in the EAP for

1 the original project site, have not changed with the  
2 revised boundary and extraction plan for the updated  
3 extraction project. And this is primarily heavily  
4 assessed based on the application of the key mitigation  
5 measures that you see in the far-right column. These are  
6 not all of the mitigation measures that will be applied,  
7 but these are some of the key mitigation measures that I'd  
8 like to draw your attention to, and that I've previously  
9 mentioned. In terms of natural vegetation, removal will  
10 be minimized and there will be a maximum use of previously  
11 disturbed areas to place the project components and the  
12 wells. No vegetation clearing during the breeding bird  
13 season. Disturbed areas will be revegetated. So, with  
14 that, we don't expect a significant adverse effects on  
15 regional wildlife populations or vegetation. Regarding  
16 fish and fish habitat, there is none on the project site.  
17 That being said, an erosion and sediment control plan will  
18 be implemented, where required, to control surface runoff  
19 and potential contamination of any surrounding surface  
20 water. Regarding air quality, there will be no dry silica  
21 dust floating around because there will be no dry silica  
22 sand piles for this extraction project. In terms of air  
23 quality emissions from vehicles and machinery required to  
24 extract the sand, that machinery will be operating not  
25 year round but within the extraction -- annual extraction

1 activities timeline which is about mid-April to about  
2 November of each year. That machinery will be limited to  
3 certain areas and will move around the project site as  
4 wells are drilled, and as wells are decommissioned and new  
5 wells are opened. Regarding noise, there'll be -- the  
6 extraction activities will have a set back distance of  
7 approximately 100 metres from existing residents. The  
8 noise from this machinery, because it's moving around the  
9 site as well as are opened and closed, it'll be short term  
10 if there are any noise issues, but if there are noise  
11 issues, additional mitigation will be applied and that  
12 will be in discussion with the people who are affected by  
13 any noise. Regarding human health, the key issue about  
14 human health, from what we heard from the public input,  
15 was regarding groundwater and drinking water. And the  
16 ongoing mitigation and monitoring plans were discussed by  
17 our previous hydrogeo panel.

18

19 So, in terms of labour force and  
20 employment, the extraction project and combined with the  
21 facility project, will employ 90 to 100 people  
22 approximately during operations. And there will also be  
23 spin-off jobs for support services, which could employ up  
24 to 250 people, approximately.

25

1           So, in summary, the residual environmental  
2 effects of this revised extraction plan remain the same  
3 conclusion as being not significant. With that being  
4 said, the -- there will be environmental protection plans  
5 and monitoring. So the -- the plans, environmental  
6 protection plans and monitoring plans as proposed in the  
7 EAP and in response to the EAP review, are listed here.  
8 The ones with the green asterisks have already been  
9 submitted to Manitoba Government for review in various --  
10 varying forms of completion, depending on how developed  
11 the project plan is, and as the project design advances,  
12 these plans will be updated to reflect that. One  
13 exception is the closure plan at the bottom. That should  
14 have had a -- an asterisk on it, but because it was just  
15 submitted, it is under review by Mines Branch now, and  
16 that's the closure plan. Additional monitoring plans will  
17 be developed, and our geological team did mention the  
18 TARP, which is the Trigger Action Response Plan, that will  
19 also be implemented, as well, any other monitoring and  
20 mitigation plans that may be included in *Environment Act*  
21 licence for this project.

22

23           And with that, I'll turn it over to Laura  
24 to discuss the public participation and input.

25

1 MS. WEEDEN: This is Laura Weeden. Thanks,  
2 Marlene. So we just wanted to give a quick overview of  
3 Sio's public engagement process that began quite a while  
4 ago. So, with respect to the extraction project  
5 specifically, Sio hosted a couple of meetings, starting  
6 with an online community meeting that occurred in August  
7 of 2021. This was by Zoom. Unfortunately, we were under  
8 COVID restrictions at the time, as everyone probably does  
9 not want to remember and just -- unfortunately, we were  
10 forced to do this online. So, we did advertise widely by  
11 flyers, and online, and with the -- the local newspapers,  
12 and we had about 70 people attend via online. There was  
13 an option to phone in if computer was not an option. And  
14 additionally to this, because we did receive a lot of  
15 feedback that in-person would be preferred, we opted to  
16 host an in-person event in the Fall of 2021, as well.  
17 This was advertised locally by flyers, and we had about 25  
18 people in attendance for that event. Yeah, in addition,  
19 we also hosted several larger meetings that were meant to  
20 kind of encompass the entire project, starting in 2017  
21 with one as a general project meeting, where the initial  
22 idea of the project was presented in Anola, and then  
23 subsequently in 2019, there were three meetings that were  
24 held across the area to discuss the project, and an update  
25 as to where Sio was at. And specifically focused on the

1 facility, there was a virtual meeting in 2020, both in May  
2 and in December, which had the same opportunity to phone  
3 in at the same time. And in addition to this, we actually  
4 also hosted a meeting a couple of weeks ago to respond to  
5 any additional questions that the community may have. And  
6 I believe there were about 40 or 50 people who signed into  
7 that one. And finally, we have also had ongoing meetings  
8 with various Indigenous groups and municipalities and  
9 towns in the area. This has encompassed over 22 different  
10 meetings over the -- over the time that Sio has been  
11 active in the area. I think Marlene's going to give one  
12 final slide.

13

14 MS. GIFFORD: That's right. Marlene  
15 Gifford, AECOM. So this last slide, just -- I wanted to  
16 emphasize the opportunities for public review for the  
17 environmental assessment of this project. There was  
18 approximately 30 days, give or take a period, for review  
19 of the *Environment Act* proposal and all of those  
20 submissions were uploaded to the public registry and were  
21 available for public review. I think Cliff sort of  
22 reiterated earlier in his presentation, that process, the  
23 public submits questions and concerns, the proponent,  
24 assisted by the technical specialist, provides responses,  
25 and the Manitoba Environmental Approvals Branch uploads

1 all that information to the public registry. This  
2 project, being subject to the CEC hearings, has additional  
3 opportunity to have public input and review, and that will  
4 conclude in a couple of weeks. So with that, I thank you.

5

6 THE CHAIRMAN: Chair. Thank you very  
7 much. I love your estimation of time. That was 44  
8 minutes. Kudos to you for that. So, the time is 11:20 --  
9 sorry, 12:25. I propose we break now for lunch, and we  
10 will reconvene at 1:25. Okay, 1:25.

11

12 (OFF RECORD: 12:25 P.M.)

13 ON RECORD: 01:25 P.M.)

14

15 THE CHAIRMAN: Chair. All right. It is  
16 1:25. I am pleased to see everyone in their seats and  
17 ready to go. So, thank you very much for coming back in  
18 an efficient manner. Dennis, I believe you are up first,  
19 sir, and you have 30 minutes.

20

21 UNKNOWN SPEAKER: Yes.

22

23 MR. SAMOILOFF: Mr. Chair, prior to  
24 proceeding, may I -- I make a quick clarification on one  
25 of our slides?

1

2

THE CHAIRMAN: Chair.

Please

3

proceed.

4

5

MR. SAMOILOFF: Cliff Samoiloff,

6

AECOM. I would just like to point out to everybody

7

gathered here regarding a correction that I would like to

8

make on slide number 19. The last box says, "If the

9

minister considers recommendations and may issue an

10

environment act licence with conditions." It is actually

11

not the minister. It is the director. So, I just wanted

12

to make that clarification prior to proceeding.

13

14

THE CHAIRMAN: Chair. Thank you very

15

much for that. Duly noted. Dennis, are we good to go?

16

Please may -- everyone, remember to state your name when

17

answering the question. I know sometimes the back and

18

forth we can be quick to hit the button and just to speak,

19

but name please.

20

21

MR. LENEVUE: It's Dennis LeNevue. I have a

22

very quick question about Kyoto sand. If the pH is below

23

six, I think it becomes soluble. Is it then inoperable?

24

25

MR. BARKH: Mohsen from Recens. Could you

1 please repeat the question?

2

3 MR. LENEVUE: Kyoto sand filtration. I  
4 believe I saw in a slide that says if -- if the pH is  
5 acidic, it becomes soluble. And so, be below pH six it  
6 won't work. Is that correct?

7

8 MR. BARKH: Mohsen from Recens. Yes,  
9 that's correct.

10

11 MR. LENEVUE: Thank you. I'd just like to  
12 point out that the other day I showed that nitric --  
13 nitric acid would -- nitric acid would form from  
14 collection of diesel fumes as well as sulphuric acid from  
15 the compressor, and that finds from the shale that would  
16 be brought up with the water could as well produce acid.  
17 So, if the acid presented to the Kyoto sand in the process  
18 water was below pH 6, then I hear from you it won't work.  
19 Is that correct?

20

21 MR. BARKH: Mohsen from Recens. Yes,  
22 that's correct. However, our system had three measurement  
23 of the pH. One of them is at the beginning of the  
24 process, and we adjust pH to make sure we are within six  
25 and nine, then we are injecting the chitosan. So, for

1 that reason, we are hundred percent sure that this pH's  
2 going to be in the range that's working.

3

4 MR. LENEVUE: Thank you. And I'm wondering  
5 about the maintenance requirements for all those filters  
6 and the Kyoto sand that's collected at the bottom. How  
7 often do you have to change the filters and collect the  
8 Kyoto sand waste, and how much waste is that per year for  
9 this big project?

10

11 MR. BARKH: Mohsen from Recens. Actually,  
12 the system work on a continuous base. Normally we have  
13 three or four filters working in parallel. One of them is  
14 a backwash all the time, and three is working. So, we  
15 have something around five percent residual at the end of  
16 the cycle of each treatment of by volume. For example, if  
17 we are treating hundred gallon per minute, we produce five  
18 like gallon per minute of waste. This waste is not going  
19 to be disposed of because now the particles in this case  
20 are larger than the fine material. So, we return them  
21 back to the beginning of the process to be removed by the  
22 clarifier. So, the filter basically continuously  
23 backwash, and there is no waste from that process. The  
24 produced waste -- the backwash from this process goes to  
25 the clarifier and is collected as sludge from the

1 clarifier.

2

3 MR. LENEVUE: Thank you for that answer.  
4 What happens to the backwash water, and where do you get  
5 it from?

6

7 MR. BARKH: Mohsen from Recens. As I  
8 mentioned, the backwash water goes back to beginning of  
9 the process because now we have larger particle. They sit  
10 out in the clarifier, and they go as sludge of the  
11 clarifier. Sludge of the clarifier at the end of the  
12 process or whenever it's required basically ship to the  
13 landfill.

14

15 MR. LENEVUE: Thank you. I want to go onto  
16 this slide for the permitting, and all the injection wells  
17 require permit. One of the conditions of the permit is  
18 continuous monitoring of the pressure in the formation.  
19 Now, the intention of that is to ensure protection of  
20 well, essentially the cap rock. Now, during operation you  
21 can change the pressure, even such as a draw down so that  
22 the -- if you draw the pressure down, as I understand,  
23 there'll be an increased net overburden pressure on the  
24 top. It can affect the stability of the limestone. So,  
25 you need a pressure measurement right in the cavity near

1 the apex continuously, according to this injection well  
2 permit. Can you describe how that will be done, measuring  
3 the pressure within the cavity continuously during  
4 injection?

5

6 MR. BULLEN: Mr. LeNevue, that's a hydro  
7 geology question which you actually posed yesterday and  
8 was answered at length in your descriptions showing the  
9 injected water.

10

11 MR. LENEVUE: Thank you. It's -- actually  
12 in this context it's a question referring to permitting,  
13 and because then that pressure information I assume is  
14 transferred to the regulator. So, in the context of this  
15 regulation, can you answer what will be done with the  
16 pressure measurement, and will it be delivered to the  
17 regulator so they can make this assessment?

18

19 MS. WEEDEN: This is Laura Weeden. So, Sio  
20 will follow any regulations that are -- or requirements  
21 that are stipulated in a licence, and that may include  
22 measurement of pressure. We haven't seen what it would  
23 look like in a licence, so if it includes measurement of  
24 pressure, then that's what we would do.

25

1 MR. LENEVUE: Thank you. Next slide please.

2 There's also in the permitting requirements --  
3 requirements for sealing, and this is 928, and you can see  
4 it's been very effectively sealed on the outside, but the  
5 production shoe is not known because it's pulled out from  
6 what I understand, and it would be put in presumably at  
7 the time of drilling, and then later on when the  
8 extraction comes along, an air tube is put in, you  
9 extract, and sometimes later you pull out the casing, and  
10 some time later you would seal that well, and this is for  
11 a lot of wells. So, I'm wondering what -- how many wells  
12 would be left unsealed sticking out of the ground before  
13 they're sealed, and in -- in an open -- well, they're not  
14 open I imagine, afterwards they're capped, but just how  
15 long before they're finally sealed?

16  
17 MR. BULLEN: They would be sealed typically  
18 within -- sorry, Brent Bullen, Sio Silica. I believe your  
19 question at the end of that is how long after we produce  
20 the well it'll be left open until we seal? Okay.  
21 Typically, that's done within a 30 day period. It could  
22 be as short as two days after. Depends on the pad,  
23 depends on the time of year, but if we got into fall, it  
24 would be within a -- a 30 day window from start to finish  
25 and sealing. That's the rolling reclamation.

1

2

MR. LENEVUE: Thank you. Next slide please.

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MR. BULLEN: Brent Bullen, Sio Silica.

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Now, with respect to sealing, there's a requirement in the regulations that annuli for injection welds have to be sealed, and this is 923, and there's a very peculiar system here where outside the PVC casing there's an annulus, and you can actually see the production tube in this one, it got stuck, it's in the middle, and it's still there, and I understand this is an anomalous in most ones who can pull them out, but I'm -- my question is what is the purpose of this outer open annulus? It violates the regulation, that you can see opens into the carbonate. Is this a standard procedure, and so what is its purpose?

First I'll point out, this is not a schematic from Sio Silica. We did not produce this. That said, within the construction well report the use of a secondary surface containment is standard within the water well drilling industry. The construction report on this well was filed with -- with the appropriate authorities, and we left it open for further evaluation. Typically you would actually see a complete sealing to the surface, but this is actually drilled in compliance with acceptable measures, and it was -- it was accepted by the mines branch when we

1 filed the paperwork for it. Perhaps, I'm -- I apologize  
2 Mr. LeNevue, but I didn't realize I pressed the button  
3 right there. What you have to keep in mind is when you  
4 look at a go forward basis, and you look at the actual  
5 methodology of our abandonment plans, you have complete  
6 sealing to surface within the wellbores when they're  
7 abandoned and sealed, and you don't have a -- a -- a well  
8 in the position like you see here with a 16th inch  
9 retainer. That's typically done during surface drill  
10 operations to hold the till back.

11

12 MR. LENEVUE: Thank you for your answer. I  
13 just want to point out, there is the well report  
14 summarized there on the right. Can we go onto slide one  
15 please?

16

17 MR. BULLEN: Mr. -- Mr. LeNevue, can I -- I  
18 need to make a small correction. I said the -- we filed  
19 the paperwork with the mines branch. It's actually with  
20 the water branch. Yeah. The construction report. Thank  
21 you.

22

23 MR. LENEVUE: Can we go to -- yes. Now,  
24 this is for infrastructure permitting. On this one you  
25 can see there's some infrastructure that has to be crossed

1 with these flurry lines in particular by Highway 302, but  
2 I -- I'm wondering more about the 500 kilo load hydro  
3 lines, and the point to bottom line, those are two lines  
4 that must be crossed that we require hydro permission, but  
5 in the IR's it said the negotiations with hydro were  
6 ongoing. Can you please comment on that permission and  
7 how that is? For instance, the permission isn't  
8 forthcoming. How -- how would that affect to the  
9 biddability of your project in the near term of your  
10 project plans?

11

12 MR. SOMJI: Hi there. It's Feisal Somji  
13 from Sio. So, we've had several discussions with Manitoba  
14 Hydro. They are aware of our -- of our plans and the  
15 requirements to cross underneath some of their  
16 infrastructure. We've -- we've got agreements in  
17 principle in regards to that, but we're -- we're still  
18 moving forward with the actual documentation, which right  
19 now is -- is between us and -- and Manitoba Hydro, but  
20 they are aware of -- of our operations.

21

22 MR. LENEVUE: Thank you. Could we go to  
23 another slide? It shows flowing well pattern. It might  
24 be slide -- not this one. No, it's further down. Yes,  
25 this one. There are as well groundwater regulations

1 regarding flowing wells, which in the permit says must be  
2 followed. As you can see, right in the middle of your  
3 project area there's a -- a fairly large region of flowing  
4 wells. And so, there may be special -- there are special  
5 permitting regulations there, but I heard yesterday that  
6 you'd be avoiding this area. So, maybe this isn't an  
7 issue, but I just ask if you're avoiding this area, how do  
8 you make up for it? Do you go outside the project area,  
9 or are -- are you really going to avoid that area?

10

11 MR. BULLEN: It's Brent Bullen with Sio  
12 Silica. Mr. LeNeveue, it's hard for me to comment on a  
13 slide that I'm seeing for the first time, but what we did  
14 mention yesterday is that when we are in areas, artesian  
15 wells, that -- that's not an area where we would look at  
16 active production during the season, and seasonality of  
17 artesian wells does occur seasonally. It's not there all  
18 the time, and through the project area we have not come  
19 across artesian wells for the scope of the CEC area that  
20 we're talking with.

21

22 MR. LENEVUE: Thank you. This picture is  
23 from Friesen Drilling I think 2019, but the area on the  
24 left is -- no, on the right is Vivian, those two dots,  
25 they're not very well shown. So, this is -- in the

1 middle, toward the west side of your project area, so  
2 maybe you haven't seen it up until now, but it's all --  
3 the blob in the middle is all within your project area,  
4 and I can't speak to the seasonality of this. I would  
5 have to contact the author of this report to see how  
6 seasonal that blob in the middle is, but it is a big area.  
7 If -- if it persisted throughout the season, how would you  
8 -- how would that affect the -- the area and the geometry  
9 of your project?

10

11 MR. BULLEN: Brent Bullen, Sio Silica. I  
12 guess two questions there I hear. You know, one, when  
13 we're looking at -- at regulations, of course we're going  
14 to follow and adhere to all regulations that we have a  
15 requirement to adhere to and follow them in good practice.  
16 With respect to the project area, we have had the drilling  
17 of wells throughout our project area that we're in front  
18 of the CEC for now, and we've not come across artesian  
19 wells, but should that condition exist in an area, of  
20 course we'll follow the guidelines that are required, and  
21 from a company's perspective, we're not interested in  
22 production in an artesian time or an artesian area.

23

24 MR. LENEVUE: Thank you. Could you move  
25 down further here?

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THE CHAIRMAN: Chair. Dennis, can you please remember for the person on the other end, I beg of you to say your name. I think you were up to a streak of five times without -- the person on the other end I'm sure has no idea who's talking.

MR. LENEVUE: I apologize for that. It's Dennis LeNeveue. Now, my question is regarding to the permitting the rail loop, it's not well shown there, but there's a circular rail loop right next to your processing facility that needs permitting by I believe transport -- Canada Transport Agency, CN Rail, and Manitoba Infrastructure. Could you just comment about the permitting of that rail loop, and when -- how it's going, and -- and when you expect to actually lay your tracks?

THE CHAIRMAN: Chair. So, I'm not sure that falls within our terms of reference.

MR. LENEVUE: Well, I thought this was permitting. That rail line required permitting. Am I missing something here? Permitting of the rail line, does it not fall under permitting?

1 MR. BULLEN: Brent Bullen with Sio Silica.  
2 That's -- it's part of the facility, and that's part of a  
3 different application. I don't believe it's part of the  
4 CEC review. I apologize if I cut somebody off there.

5  
6 MR. DUNCANSON: Mr. Chair, Sander  
7 Duncanson here. Perhaps Mr. LeNevue, if -- if I could  
8 help. This panel is available to speak to permitting  
9 issues as it relates to the EAP that is under  
10 consideration in this process, which does not include the  
11 rail loop.

12  
13 MR. LENEVUE: Okay. Thank you. There are a  
14 couple more slides. Hopefully, we get time to see them.  
15 The one on the noise and light. Yes, thank you. I'm just  
16 wondering about RM bylaws regarding noise and light, and  
17 how they'll -- what interaction you had with the RM  
18 regarding these, and how they'll be complied with. And I  
19 just give you an example there of the -- of noise  
20 barriers. It might be necessary on a drill rig, but I  
21 know I can't comment on it. So, as I -- it's just a  
22 question on the RM noise and light bylaws, and what -- how  
23 they'll be followed, and any interaction you've had so far  
24 regarding that.

25

1 MR. SAMOILOFF: Cliff Samoiloff,  
2 AECOM. So, I can't speak to any interactions that Sio has  
3 had -- Sio has had with the RM of Springfield. What I can  
4 say is that both noise and light were addressed in the  
5 Environment Act Proposal. I'll start with noise first.  
6 So, what we've proposed as far as noise is a little bit  
7 different than -- than what's been proposed for other  
8 aspects like air for example. We're actually going to be  
9 doing direct measurement of noise prior to extraction  
10 operations. So, what that means is prior to any drill  
11 rigs running or any other noise generating equipment  
12 operating, Sio will collect baseline noise measurements at  
13 the closest receptors, at a minimum of 100 metres from the  
14 closest receptors. What they will do is they will measure  
15 the ambient noise, which is noise that's generated in the  
16 area prior to any development, and then they will test the  
17 equipment by running the equipment and measuring noise at  
18 the same points, okay? So, they will collect noise  
19 readings at multiple points, and the target that we have  
20 established is that noise will not exceed 60 decibels at  
21 those target test areas. We feel that that's an  
22 appropriate number based upon the noise modelling that was  
23 done as part of the facility project, and that's below  
24 what the -- the standard is for noise of -- of 80  
25 decibels.

1

2

MR. LENEVUE: Thank you for that answer.

3

I'm just wondering, you've been doing extraction and

4

drilling for a number of years now. Have you measured the

5

noise from those activities at this -- in the past, and if

6

so, what are the results?

7

8

MR. BULLEN: It's Brent Bullen, Sio Silica.

9

We did measure the noise on BRU-154. I did it. And we

10

were 52 DB at 100 metres from the noise source at the time

11

at night, and the ambient noise pressure that was measured

12

at that time was in the range of 48 to 56 DB, depending on

13

crickets, frogs.

14

15

MR. LENEVUE: Thank you. And just a point

16

of clarification, what was the noise source for that

17

measurement?

18

19

MR. BULLEN: It was a DR24 extraction rig

20

that we were using to do an extraction test.

21

22

MR. LENEVUE: Thank you very much. Is that

23

data available somewhere?

24

25

MR. BULLEN: It's not available in any of

1 the public filings, but we can take it under advisement.

2

3 MR. LENEVUE: Thank you. That brings up  
4 another question about public availability of the data.  
5 For instance, the pressure data that now I gather will be  
6 measured. I actually requested the data for 928 in an IR  
7 and was refused. I thought the regulator would have it,  
8 so I asked Manitoba Groundwater for it, they didn't have  
9 it, and they tried to get it from Sio Silica, but were  
10 assured it was not required. However, the data was given  
11 to CEC for two monitoring wells, but they were at 100  
12 metres and 200 metres, not in the cavity. So, I'm just  
13 wondering this pressure data, if and when it's gathered as  
14 required by the permit, who will it be available to?  
15 Would it be available to the public as well? Because it's  
16 required by the regulator, you would think it would be  
17 public data.

18

19 MR. BULLEN: Brent Bullen, Sio Silica. I'm  
20 just trying to digest the full question there, Mr.  
21 LeNevue. I think if you look at the filings that we do,  
22 we filed everything in accordance with the regulators, and  
23 those filings -- how they handle it in information  
24 requests or public information requests, you know, we're  
25 not involved in that process. You know, through our

1 ongoing plans, management plans, mitigation plans,  
2 adaptive management plans, we're going to be required to  
3 have ongoing filings, and those filings will be with the  
4 regulators in the province and how they choose to  
5 disseminate that information will be up to them. I can't  
6 comment on that.

7  
8 MR. LENEVUE: Thank you. So, I assume from  
9 your answer the data would be given to the regulator, but  
10 then if the public wanted it, we would have to get it from  
11 the regulator. Is that correct?

12  
13 MS. WEEDEN: This is Laura Weeden. I  
14 believe in some of our monitoring draft plans we do commit  
15 to providing the community with some of that data. The  
16 exact structure of how that's going to be done has yet to  
17 be determined.

18  
19 MR. LENEVUE: Thank you for your answer.  
20 That completes my questions.

21  
22 THE CHAIRMAN: Thank you very much.  
23 OLS? No. They told me no.

24  
25 UNKNOWN SPEAKER: They did? Okay.

1 Great.

2

3 MR. CLAWSON: This is Chris Clawson speaking  
4 for Our Line in the Sand. Good afternoon members of the  
5 panel, Mr. Chair, panel members. I expect that most of my  
6 questions this afternoon will be directed to Mr. Samoiloff  
7 and Ms. Gifford. I may have one for you, sir, but as a  
8 general rule, I'll pose questions generally to the panel,  
9 and then whoever's most appropriate to answer, please feel  
10 free to just step in. And before I begin, briefly a note  
11 for Mr. Chair. As discussed earlier today, I've been  
12 allotted 30 minutes. My goal will be to finish between 20  
13 and 25, and I can advise that if I do leave time on the  
14 table so to speak, Mr. Williams will likely request to use  
15 it later.

16

17 THE CHAIRMAN: Chair. I'll take that  
18 under advisement.

19

20 MR. CLAWSON: Clawson speaking. Now,  
21 members of the panel, from AECOM, you'll be familiar I  
22 expect with section six of the EAP.

23

24 MS. GIFFORD: Marlene Gifford, AECOM.  
25 That's correct. That's the environmental assessment

1 section.

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MR. CLAWSON: Clawson speaking. Thank you, and -- and exactly. So, the environmental assessment section, is it accurate to say that that section estimates the nature of the impacts of the proposed activities on -- on various environmental components?

MS. GIFFORD: Marlene Gifford. That's correct.

MR. CLAWSON: Clawson. Thank you. And just by way of illustration, I'll refer briefly to section 6.5.1 discussing vegetation. And can you confirm please that section 6.5.1 assesses the magnitude of the effect on -- of proposed project activities on vegetation to be minor in the project site, and negligible in the local project area?

MS. GIFFORD: Marlene Gifford. That's correct.

MR. CLAWSON: Clawson. Thank you. And the direction of the effects on vegetable will be adverse?

1 MS. GIFFORD: Marlene Gifford. That is  
2 correct. Vegetable will be temporarily removed.

3  
4 MR. CLAWSON: Clawson. Thank you. And to  
5 avoid taking up too much time with back and forth, can you  
6 confirm that the duration on vegetable is estimated to be  
7 long term, frequency, intermittent, scope, project site to  
8 local project area, and reversibility assessed as  
9 reversible, correct?

10  
11 MS. GIFFORD: That is correct. Marlene  
12 Gifford.

13  
14 MR. CLAWSON: Clawson, Thank you, Ms.  
15 Gifford. And is it accurate to say that these  
16 characteristics of -- of the anticipated effects on  
17 vegetation are based on AECOM's assessment of the  
18 interactions between the activities associated with the  
19 proposed project, and the existing vegetation in the  
20 project area?

21  
22 MS. GIFFORD: Marlene Gifford. That's  
23 correct.

24  
25 MR. CLAWSON: Clawson. Thank you, Ms.

1 Gifford. And in fact, section four of the EAP titled,  
2 "Existing Environment", is intended to present baseline  
3 data with respect to ecosystem components for the purposes  
4 of assessment of potential effects. Is that accurate?

5

6 MS. GIFFORD: Marlene Gifford. That's  
7 correct.

8

9 MR. CLAWSON: Clawson. Thank you. And  
10 sticking with our use of vegetation by way of  
11 illustration, the portion of section four that describes  
12 vegetation identifies the nature of the existing land  
13 cover types, as well as dominant tree species and forest  
14 ages. Is that correct?

15

16 MS. GIFFORD: Marlene Gifford. That is  
17 correct.

18

19 MR. CLAWSON: Clawson. And in fact, if we  
20 were to scroll -- and -- and I don't need to -- to take  
21 you there, but just to confirm, if we were to scroll to  
22 figures 44, 45, and 46, you'd see in section four detailed  
23 illustrations including maps setting out exactly that  
24 information, correct, on existing landcover types, tree  
25 species, the dominant tree species.

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MS. GIFFORD: My apologies. Marlene Gifford. That is correct. That information was obtained from the Manitoba Lands Initiative. That's the latest information we have on broadscale regional landcover -- vegetation landcover.

MR. CLAWSON: Thank you for that response, Ms. Gifford. This is Clawson speaking. We'll move on from vegetation now to -- to air quality. And I'd like to go through the six factors considered with respect to effects that we -- that we discussed earlier with vegetation, and again, back to section six as opposed to section four. With respect to air quality, AECOM has assessed the magnitude of the likely effects to be minor to negligible, correct?

MS. GIFFORD: Marlene Gifford. That's correct.

MR. CLAWSON: And just for the purposes of -- of confirming my own understanding and -- and those of others in the room, I'll refer also a few pages previous to table six too, which -- which just sets out the definitions that you're using when assessing likely

1 effects. And so, when we're talking about magnitude, a  
2 negligible effect is one that's immeasurable, correct?

3

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MS. GIFFORD: That is correct.

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MR. CLAWSON: Clawson speaking. And a minor  
effect is one that will effect less than one percent of  
the population or resource, correct?

MS. GIFFORD: That's correct by our  
definition.

MR. CLAWSON: Thank you. Clawson speaking.  
And so, in terms of air quality, the assessment of the  
likely effect as minor to negligible means that less than  
one percent of the population being residents of the  
project area will experience effects on air quality?

MS. GIFFORD: Marlene Gifford. That's  
correct by the definition.

MR. CLAWSON: Clawson -- Clawson. Thank  
you. And moving onto the other characteristics of the  
likely effects on air quality. The direction is estimated  
to be adverse, correct?

1

2

MS. GIFFORD: Marlene Gifford. That's

3

correct.

4

5

MR. CLAWSON: Thank you. Clawson. And

6

referring to your definitions, meaning that it's a

7

negative effects, or in other words that it won't improve

8

air quality, correct?

9

10

MS. GIFFORD: Marlene Gifford. Correct.

11

There will be some temporary emissions from machinery that

12

would effect air quality.

13

14

MR. CLAWSON: Clawson. Understood. Thank

15

you. And duration for air quality is assessed as long

16

term? And I realize now that I'm causing you to -- to

17

scroll back and forth two or three pages with -- with each

18

question, and that's poor planning on my part, and you ---

19

20

MS. GIFFORD: Sorry. Marlene Gifford. That

21

is correct.

22

23

MR. CLAWSON: Clawson. Thank you. And long

24

term duration means that it will take the population or

25

resource more than ten years to recover from the impacts

1 of the proposal project?

2

3

MS. GIFFORD: That is correct. Marlene

4

Gifford.

5

6

MR. CLAWSON: Clawson. Thank you. And the

7

frequency of the effects on air quality are estimated to

8

be intermittent, correct?

9

10

MS. GIFFORD: Marlene Gifford. That is

11

correct.

12

13

MR. CLAWSON: And your EAP sets out for

14

classifications with respect to frequency being once,

15

rare, intermittent, or continuous, correct?

16

17

MS. GIFFORD: Yes, that is correct.

18

19

MR. CLAWSON: Thank you. And we also thank

20

Mr. Samoiloff for pulling up the other page for us. And

21

I'll skip scope. But moving finally to reversibility.

22

Reversibility refers to the likelihood that an effect will

23

be reversable after conclusion of the activity, correct?

24

25

MS. GIFFORD: Marlene Gifford. That is

1 correct.

2

3 MR. CLAWSON: Clawson. And the  
4 reversibility of effects on air quality are assessed as  
5 reversible, correct?

6

7 MS. GIFFORD: Marlene Gifford. That is  
8 correct.

9

10 MR. CLAWSON: Thank you. Clawson speaking.  
11 Did AECOM conduct air quality dispersion modelling to  
12 inform its determination of likely effects on air quality?

13

14 MR. SAMOILOFF: Samoiloff. No, we did  
15 not do a formal dispersion model for the extraction  
16 project.

17

18 MR. CLAWSON: Clawson. Thank you. And  
19 AECOM did not conduct air quality dispersion or other  
20 studies to establish baseline air quality data, correct?

21

22 MR. SAMOILOFF: Samoiloff. Yes,  
23 that's correct.

24

25 MR. CLAWSON: Clawson speaking. Thank you.

1 Moving on from air quality to noise and vibration. Is it  
2 correct to say or accurate to say that the AECOM EAP also  
3 contemplated likely effects related to noise and  
4 vibrations?

5

6 MR. SAMOILOFF: Samoiloff. Yes, those  
7 were considered in our assessment.

8

9 MR. CLAWSON: Clawson speaking. Thank you.  
10 And briefly beginning with vibration, section four of the  
11 EAP indicates that beyond a preliminary assessment, I  
12 quote, "Vibrations are not considered further in this  
13 report.", correct?

14

15 MR. SAMOILOFF: Samoiloff. Could you  
16 repeat the section number please?

17

18 MR. CLAWSON: Clawson. Of course. That's  
19 EAP section 4.2.2. And if you're looking at the  
20 electronic version, it's PDF page four of part two.

21

22 MS. GIFFORD: Yes. We do say -- Marlene  
23 Gifford speaking. There's no available records of public  
24 complaints regarding vibrations from previous well  
25 drilling activities at the project site for the

1 exploration. Therefore, vibrations were not considered  
2 further in the report.

3

4 MR. CLAWSON: Clawson. Thank you, Ms.  
5 Gifford. You answered my next question for me. And with  
6 your reference to public complaints in mind, can you  
7 please confirm that AECOM does not cite any data with  
8 respect to vibrations created by well drilling in its  
9 decision to not consider this issue further in the EAP?

10

11 MS. GIFFORD: No complaints were brought to  
12 the attention -- to my attention from Sio and their  
13 ongoing public engagements regarding vibrations. Oh,  
14 sorry, Marlene Gifford.

15

16 MR. CLAWSON: Thank you, Ms. Gifford. This  
17 is Clawson speaking. And -- and so, just to confirm the  
18 response to my question, can you please confirm that the  
19 only reason cited by AECOM for not further considering  
20 vibrations is that there were no available records of  
21 public complaints regarding vibrations from previous well  
22 drilling activities?

23

24 MR. SAMOILOFF: Samoiloff. Mr.  
25 Klassen, could you repeat the question just one more time

1 please?

2

3 MR. CLAWSON: Clawson speaking. Yes, of  
4 course. And Mr. Samoiloff, I'm -- I'm still referring to  
5 section 4.2.2 as -- as we discussed a moment ago, and as  
6 Ms. Gifford confirmed that section indicates that  
7 vibrations are not considered further in this report, and  
8 my question simply is -- is asking you to confirm that the  
9 only reason given in that section for vibrations not being  
10 considered further is this statement, which I'll read  
11 here, that there are no available records of public  
12 complaints regarding vibrations from previous well  
13 drilling activities.

14

15 MR. SAMOILOFF: Samoiloff. I wouldn't  
16 say that it's entirely accurate that we didn't do a formal  
17 assessment on the vibration just based upon that statement  
18 alone. We also do use our professional judgement, and we  
19 -- we did indicate that within our assessment that we will  
20 rely on professional judgement at times, and that would be  
21 based on our experience with other mining projects, and a  
22 knowledge of vibration generating equipment, as well as  
23 the drilling process itself. So, although complaints were  
24 certainly factored into that, I wouldn't say it was the  
25 only -- the only consideration.

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MR. CLAWSON: Clawson speaking. Thank you, Mr. Samoiloff. And I really don't want to get as hung up on this section, but are those other considerations cited in section 4.2.2?

MS. GIFFORD: Marlene Gifford. In section 6.1 effects methods -- effects assessment methods, we do say that potential interactions were identified based on professional judgment, understanding of project components, construction methods, operation processes, and the assumption that standard environmentally responsible construction techniques and operating procedures will be applied during project construction operation and decommissioning.

MR. CLAWSON: Clawson speaking. Thank you, Ms. Gifford for that response. Much appreciated. And staying in section six now that you've scrolled there, can you please confirm that the magnitude of effect with respect to noise has been assessed as being minor to moderate?

MS. GIFFORD: Marlene Gifford. That is correct.

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MR. CLAWSON: Clawson. Thank you. And the direction of the effect is adverse?

MS. GIFFORD: Marlene Gifford. That's correct.

MR. CLAWSON: Clawson. Thank you. And the duration is short term, and frequency intermittent, correct?

MS. GIFFORD: Marlene Gifford. That is correct.

MR. CLAWSON: Clawson. Thank you. And regarding noise, can you please confirm that -- that AECOM notes in the EAP that noise has limited distance influence depending on the nature of the noise source and landscape features surrounding the sources of noise?

MR. SAMOILOFF: Samoiloff. Yes, that is correct.

MR. CLAWSON: Clawson. Thank you. And without asking you to go into specific detail, can you

1 please confirm that the studies cited by AECOM in this  
2 section of its EAP with respect to noise confirmed that  
3 sound attenuation outdoors varies by factors that include  
4 for example type of groundcover?

5

6

MS. GIFFORD: That is correct.

7

8

9

MR. CLAWSON: Clawson. Thank you. As well  
as type of tree cover and existence of foliage or leaves?

10

11

12

MR. SAMOILOFF: Samoiloff. Yes, those  
are all factors that contribute to noise attenuation.

13

14

15

16

17

MR. CLAWSON: Clawson. Thank you.  
Additional factors cited in -- in those reports include  
the presence of roadways and the frequency of the sound?

18

19

MS. GIFFORD: Marlene Gifford. Can you  
repeat the question?

20

21

22

23

24

25

MR. CLAWSON: Clawson speaking. And just  
confirming two additional factors that may effect sound  
attenuation in forests cited by these studies -- or  
identified by the studies, cited by AECOM, include the  
presence of roadways, and forest clearance for roadways,

1 as well as the frequencies of the sounds that are being  
2 tested?

3

4 MR. SAMOILOFF: Samoiloff. Mr.  
5 Klassen, could you identify which section that verbiage is  
6 from?

7

8 MR. CLAWSON: Clawson speaking. Yes, of  
9 course. I'm in section 6.3.3. And I'm referring to the  
10 Yip and Albert studies.

11

12 MR. BULLEN: Brent Bullen with Sio. Sorry.  
13 I'm in 6.3.3, and I don't see the reference that you're  
14 referencing there. I apologize. If you can just point it  
15 out.

16

17 MR. SAMOILOFF: Yes. Samoiloff. I --  
18 I also can't find that in that section 6.3.3.

19

20 MR. BULLEN: Yeah. There's only three  
21 paragraphs there. Is it one, two, or three? Maybe you  
22 could help us. Thank you. Brent Bullen, Sio.

23

24 MR. CLAWSON: You know, in the -- in the  
25 interest of time, and I thank you for your reference

1 everyone in -- in -- in looking for those references. The  
2 -- the purpose of my question has already been answered by  
3 Mr. Samoiloff just acknowledging that there are multiple  
4 factors that effect sound attenuation in -- in forests,  
5 and I believe we've covered that off thoroughly?

6

7 MR. SAMOILOFF: Samoiloff. I would --  
8 I would generally agree with that. Yes.

9

10 MR. CLAWSON: Clawson speaking. Thank you.  
11 And as you would've looked at a few moments ago as we  
12 referenced figures 44, 45, and 46, can you confirm that  
13 there's a variable type of groundcover and species of  
14 trees within the project area?

15

16 MS. GIFFORD: Marlene Gifford. That is  
17 correct.

18

19 MR. CLAWSON: Clawson speaking. Thank you.  
20 And can you please confirm that -- that AECOM did not  
21 conduct a -- a survey to identify baseline noise data?

22

23 MR. SAMOILOFF: Samoiloff speaking. I  
24 can confirm that, yes, that is the case. Reason being was  
25 our intention in order to mitigate noise impact was to do

1 direct measurement prior to operations so that the most  
2 current ambient noise information could be obtained.

3  
4 MR. CLAWSON: Clawson speaking. Thank --  
5 thank you. And you -- you did explain that in detail to  
6 my friend, Mr. LeNeve. Now, we've -- we've covered these  
7 two points separately, but just to confirm them together,  
8 is it accurate to say that -- that AECOM assessed the  
9 frequency of impacts for both air quality and noise to be  
10 intermittent?

11  
12 MS. GIFFORD: I believe that to be the case.  
13 Marlene Gifford speaking. I would have to flip back and  
14 forth, but I believe by memory that was the case.

15  
16 MR. CLAWSON: Clawson speaking. Thank you.  
17 And it will be my goal from here on out to avoid any of us  
18 having to do flipping back and forth, but I will ask you  
19 if you can scroll in -- in your own document to table 63  
20 in section 6.3.2, assessing climate and greenhouse gasses?

21  
22 MR. SAMOILOFF: Samoiloff. Yes, I  
23 have that table.

24  
25 MR. CLAWSON: Clawson speaking. Thank you.

1 And just to confirm my understanding of the table, the  
2 second column of three, or the middle column, identifies  
3 the total utilization being hours per year of the use of  
4 the different emission sources that are identified in the  
5 left most column, correct?

6

7 MR. SAMOILOFF: Samoiloff. That's  
8 correct.

9

10 MR. CLAWSON: Clawson speaking. And -- and  
11 so, just by way of illustration, the first line under  
12 extraction we see an estimate that extraction rigs will be  
13 used approximately 60,000 hours per year?

14

15 MR. SAMOILOFF: Samoiloff. Yes,  
16 that's correct. That's the number in the table.

17

18 MR. CLAWSON: Clawson speaking. Thank you.  
19 And moving slowly down the table, the next row is  
20 compressors, and we see that compressors will be used for  
21 12,000 hours per year?

22

23 MR. SAMOILOFF: Samoiloff. Yes,  
24 that's the number in the table.

25

1 MR. CLAWSON: Clawson speaking. Thank you.  
2 And I have no intention of doing this line by line with  
3 you, but would you accept, and -- and this can be subject  
4 to check if you wish, that the combined annual total of  
5 the hours utilization of equipment in the table sums to  
6 146,200 hours per year?

7  
8 MR. SAMOILOFF: That is -- Samoiloff.  
9 That is subject to check. Keep in mind, I'm a biologist.  
10 I purposely have avoided math in school. So, it is  
11 subject to check.

12  
13 MR. CLAWSON: And keeping in mind that --  
14 that I'm a lawyer and also avoided math in school, Mr.  
15 Samoiloff. So, if we need to clarify that later, we can  
16 do so, but to confirm again, the -- the -- the sum that  
17 we're working with for the purpose of this discussion is  
18 146,200? Just -- Mr. Samoiloff, just asking you to -- to  
19 confirm the number that I'm using for illustration  
20 purposes.

21  
22 MR. SAMOILOFF: Sorry. Samoiloff.  
23 Can you repeat the question?

24  
25 MR. CLAWSON: I -- I just worried that our

1 exchange about math distracted from the number itself.  
2 And so, I -- I just asked you to confirm that the -- the  
3 sum that we're working with for illustration purposes is  
4 146,200?

5

6 MR. SAMOILOFF: Samoiloff. Yes.  
7 Having said that, it's subject to check. Yes. I will  
8 agree with that number.

9

10 MR. CLAWSON: Clawson speaking. Thank you.  
11 And with my apologies in advance, I have one more math  
12 question for you, and that's to confirm that 365 times 24  
13 equals 8,760?

14

15 MS. WEEDEN: It's Laura Weeden speaking.  
16 Can you please announce how many days you just said in  
17 your math equation?

18

19 MR. CLAWSON: Clawson speaking. 365, and I  
20 -- I really hope I'm not wrong here.

21

22 MS. WEEDEN: Laura Weeden. I just want to  
23 remind that we're not operating 365 with our operations.  
24 It's only part time of the year, April until November.  
25 So, none of that equipment would be operating in the

1 winter. Laura Weeden. Which would not be 365.

2

3 MR. CLAWSON: Clawson speaking. Thank you,  
4 Ms. Weeden. And -- and that was going to be my next  
5 question, which was just -- just to confirm that those  
6 146,000 or so hours will actually be concentrated in the  
7 April until November timeframe, correct?

8

9 MR. BULLEN: Bent Bullen with Sio Silica.  
10 That table is predicated on 250 days of operation. You're  
11 -- you can't do the math the way you're doing it because  
12 you've got multiple pieces of equipment, you're doubling  
13 up hours.

14

15 MR. CLAWSON: Understood, Mr. Bullen. Thank  
16 you. Moving onto a discussion of mitigation plans. I  
17 note in slide 29 of your presentation this morning that  
18 you list 10 monitoring or mitigation plans that are  
19 presently under development or -- or that will be  
20 developed as required, correct?

21

22 MR. SAMOILOFF: Samoiloff. That's  
23 correct. There are ten plans on that slide.

24

25 MR. CLAWSON: Thank you, Mr. Samoiloff.

1 Clawson speaking. And some of those ten plans are  
2 described as monitoring plans, correct?

3

4 MR. SAMOILOFF: Samoiloff. That's  
5 correct.

6

7 THE CHAIRMAN: Chair. So, that is  
8 your 30 minutes. Are -- am I now subtracting from ---

9

10 MR. CLAWSON: If we do, I expect I'll hear  
11 about it on the drove home, and I'm in your hands, Mr.  
12 Chair. I do have about two or three minutes of  
13 questioning left if I'm permitted to proceed.

14

15 THE CHAIRMAN: Thank you. And I  
16 appreciate your flexibility.

17

18 MR. CLAWSON: And question for the panel.  
19 Is it reasonable to expect that monitoring plans will  
20 include requirements to produce monitoring reports  
21 containing data that's collected?

22

23 MR. SAMOILOFF: Samoiloff. Yes.  
24 Typically, these plans will include requirements for  
25 reporting. It will vary as far as frequency, depending

1 upon the plan, and as you're probably aware, these types  
2 of plans are also living documents. So, year to year the  
3 reporting requirements may change, but they will always be  
4 in line with licence requirements as far as reporting.  
5 That's correct.

6  
7 MR. CLAWSON: Clawson speaking. Thank you,  
8 Mr. Samoiloff. Would Sio be opposed to a licencing  
9 condition requiring them to make monitoring reports  
10 public?

11  
12 MR. SOMJI: Yeah. It's Feisal Somji here.  
13 Our understanding is generally under the -- the -- the  
14 licencing requirements, a lot of those information will be  
15 required to be public, but we're not opposed to making  
16 public versions available, providing that there's no  
17 commercial sensitivities.

18  
19 MR. CLAWSON: Clawson speaking. Thank you  
20 for that response. And I -- I have one final question,  
21 and Mr. Bullen, this is for you. Do you recall an  
22 exchange during questioning earlier this week when you  
23 noted that Sio had received direction from the mines grant  
24 to seize operation pending the development of this Clean  
25 Environment Commission process?

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MR. BULLEN: Brent Bullen, Sio Silica.

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Yes.

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MS. BORYSKAVICH: Good afternoon. My

1 name is Krista Boryskavich, That's K-R-I-S-T-A, and I'll  
2 certainly spell the last name because you'll never get it  
3 otherwise. It's B-O-R-Y-S-K-A-V-I-C-H. So, good  
4 afternoon everyone. As you're aware, our role here is to  
5 ensure that the municipal interests of the municipalities  
6 that make up MSSAC are protected. One of the concerns  
7 that has been expressed by those municipalities is with  
8 respect to traffic and impacts on municipal  
9 infrastructures such as roads that might arise from the  
10 project. So, my first question in that regard is the EAP  
11 appears to indicate that increased traffic as a result of  
12 the project will be solely from employees travelling to  
13 and from the worksites, and the transportation of drilling  
14 and supporting equipment. Can you confirm that this is  
15 accurate?

16  
17 MR. SAMOILOFF: Samoiloff. Just --  
18 just to be certain I understand your question, can you  
19 repeat the two sources that you mentioned?

20  
21 MS. BORYSKAVICH: Sure. So, increased  
22 traffic resulting -- Krista Boryskavich. Increased  
23 traffic resulting from employees travelling to and from  
24 worksites as one, and then the second one being the  
25 transportation, and again, to and from sites or between

1 sites, I -- I suppose, of drilling and other equipment.

2

3 MR. SAMOILOFF: Samoiloff. Yes,  
4 that's -- that's accurate.

5

6 MS. BORYSKAVICH: Krista Boryskavich.  
7 So, what is the volume and the frequency of that traffic  
8 anticipated as a result of the transportation of the  
9 equipment?

10

11 MS. GIFFORD: Marlene Gifford here. A  
12 formal traffic impact assessment study was not done for  
13 the extraction project. However, preliminary traffic  
14 projections were done for this study. The results of  
15 those, I'm not a traffic engineer, but I believe that was  
16 -- there was -- the traffic intersections would not be  
17 affected -- impacted.

18

19 MS. BORYSKAVICH: Krista Boryskavich.  
20 Thank you for that. Would you undertake to make that --  
21 to -- to check on that information and make it available?

22

23 MR. SAMOILOFF: Sorry, Samoiloff. We  
24 -- we were just distracted for a moment. Could you repeat  
25 the question please?

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MS. BORYSKAVICH: Certainly. You'd said that some traffic data had been collected. Would you undertake to make that available? And again, that's Krista Boryskavich.

MS. GIFFORD: Okay. As a response to public comments on the EAP, the preliminary traffic -- this is Marlene Gifford speaking, preliminary traffic assessment memo was provided in a response to the public inquiry about traffic. And that memo is dated December 13th, 2021.

MS. BORYSKAVICH: Thank you. So, just as follow-up to that then. That would represent the only information that you have with respect to traffic impact to date?

MR. BULLEN: Brent Bullen with Sio Silica. You -- you've asked us for employees, and I'm concerned that you're maybe mixing employee calculations to the facility, which is separate from the operations under the CEC review.

MS. BORYSKAVICH: Okay. Krista

1 Boryskavich. Just to clarify, what I had asked for was  
2 the volume and frequency of traffic anticipated as a  
3 result of the transportation of equipment. So, just to be  
4 clear on that.

5  
6 MS. GIFFORD: Marlene Gifford, AECOM. I've  
7 got the memo open in front of me, the preliminary traffic  
8 protection. Let's see. "During the a.m. and p.m. shift  
9 changes, traffic generated by the proposed --" -- this was  
10 -- this took into account both the traffic from the  
11 processing facility and the sand extraction project. So,  
12 that's both projects combined. "It'll result in 64  
13 additional trips per hour on PTH15, west of PR302, and  
14 eight additional trips east of PR302. Even with this  
15 additional traffic, the total peak hour traffic volume on  
16 PTH15 is well below the hourly volume that can typically  
17 be accommodated by a second arterial. For this reason, no  
18 significant impacts to traffic operations are anticipated  
19 due to traffic generated by the proposed sand processing  
20 facility combined with the sand extraction project."  
21 That's -- those are the results of the preliminary traffic  
22 projections.

23

24 MS. BORYSKAVICH: Okay. And can I just  
25 -- Krista Boryskavich. And can I confirm as well, is it

1 correct that there will be no haul trucks throughout the  
2 lifespan of the 24 year project?

3

4 MR. SAMOILOFF: Samoiloff. I can  
5 confirm that there will be no haul trucks associated with  
6 the movement of the extracted material. If you're  
7 defining haul trucks as -- haul trucks as far as bringing  
8 in equipment and moving some of the waste material for  
9 landfill disposal, that will occur, but there will be no  
10 hauling of the extracted material.

11

12 MS. BORYSKAVICH: Thank you. Krista  
13 Boryskavich. And just to follow-up on your previous --  
14 Marlene's previous response with respect to roads that may  
15 be potentially impacted, because the EAP covers the first  
16 four to five years of the project, would it be correct to  
17 assume that you have not as yet identified which municipal  
18 roads may be utilized or impacted following that first  
19 four to five year period as the project expands?

20

21 MR. SAMOILOFF: Samoiloff. I -- I  
22 think it would be a fair statement to say that we haven't  
23 looked beyond the four to five years as far as the details  
24 of -- of traffic flow. That would be considered with any  
25 notice of alteration following this project.

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MS. BORYSKAVICH: Thank you. And finally on this topic, do you agree with the principle that any impacts on municipal roads or infrastructure that are in excess of what would be considered normal use should be the responsibility of Sio Silica?

MR. BULLEN: Brent Bullen, Sio Silica. I believe the -- the vehicle traffic on the roads, that's part of the development agreement review within the RM, and of course working with the RM, we'll respect their direction on what they would have with our volume, what they see in road use, and what would be required of us based on those parameters from the RM.

MS. BORYSKAVICH: Thank you. Krista Boryskavich. I'm going to move on now, and we've -- Mr. Clawson has raised some questions already about dust control and air quality. Section 6.3.1 of the EAP provides that there may be impacts on air quality as it relates to dust related to the movement of drilling rigs and equipment and outlines some dust control measures to be taken as required. So, my question in that respect is what is your process or what will be your process for addressing any dust pollution or air quality issues or

1 complaints raised by impacted municipalities or  
2 (inaudible)?

3

4 MR. SAMOILOFF: Samoiloff. So, as we  
5 indicated in the EAP, we do not expect there to be any  
6 issues with dust based upon the way that the extraction  
7 process is designed. Now that being said, we expect there  
8 to be monitoring requirements in the licence application  
9 just based on our experience, those are typically  
10 included, and we would have mitigation measures in place  
11 for dust such as watering of any areas where there would  
12 be -- would be dust. I'll also mention that we don't  
13 expect the construction of any new roads. Any trails that  
14 lead to extraction sites would be temporary matting, which  
15 would minimize the potential for dust generation, and the  
16 -- travelling to and from the facility would primarily be  
17 on -- on paved highways.

18

19 MS. BORYSKAVICH: Krista Boryskavich.  
20 Thank you, and I appreciate that response. I think our --  
21 our municipalities appreciate that response as well. I  
22 think I'll rephrase the question though a little bit. In  
23 terms of -- inquiring as to not just the measures that you  
24 would undertake in response to a complaint, but what is  
25 the process for a municipality to raise a complaint with

1       you and have it addressed in that regard? In other words,  
2       how are we part of the process (inaudible) forward?

3  
4                   MR. SOMJI: It's Feisal Somji from Sio  
5       Silica. Yeah. I think as we move forward there's going  
6       to be ongoing communications with the RM. We're open to  
7       continued dialogue with them. There's going to be a 24  
8       hour hotline number that we've committed to put in place  
9       for any complaints, be it from the -- the municipality or  
10      from the stakeholders, the community. And you know, we  
11      will work with the RM to ensure that the line of  
12      communication is open and there's a mechanism for reports  
13      or complaints or -- or responses.

14  
15                   MS. BORYSKAVICH: Thank you. Krista  
16      Boryskavich. And I'm going to ask a similar question with  
17      respect to any weed control issues. I don't want to  
18      assume that your answer will be identical, so I'll ask a  
19      similar question.

20  
21                   MR. SOMJI: It's Feisal Somji. Yeah. As  
22      Marlene had indicated, there's going to be a team from Sio  
23      that will be monitoring the weed vegetation and  
24      reestablishment of the areas that we've operated on. I  
25      suspect that they'll likely identify any weed issues

1 likely prior to the municipality, but same answer as  
2 before, that the lines of communication will always remain  
3 open, and -- and that'll just be part of the -- that  
4 communication.

5  
6 MS. BORYSKAVICH: Thank you. So, moving  
7 on then. Krista Boryskavich. To the issue of noise, and  
8 we've covered it a little already with this panel, so  
9 hopefully I'm not reiterating too many questions that have  
10 already been asked, but section 6.3.3 of the EAP provides  
11 that there may be minor to moderate noise disruption to  
12 residences in the vicinity of the well clusters, and  
13 outlined some noise mitigation measures to be taken. In  
14 addition, your response to the technical advisory  
15 committee report indicates that you have already conducted  
16 a noise impact assessment. Can you confirm that that is  
17 accurate and that a noise impact assessment has been  
18 undertaken?

19  
20 MS. GIFFORD: Marlene Gifford. Noise impact  
21 assessment with modelling was done for the facility  
22 project, but not for the extraction project.

23  
24 MS. BORYSKAVICH: Thank you. Krista  
25 Boryskavich. When do you anticipate completion of the

1 noise mitigation plan that you have mentioned in your  
2 presentation in response to questions, and in addition,  
3 how -- and again, you'll -- you'll notice the theme in  
4 some of these questions, but how will you ensure that  
5 municipalities in the (inaudible) have meaningful input  
6 into this plan?

7  
8 MR. SAMOILOFF: Samoiloff, AECOM. To  
9 answer your first question regarding when the plan will be  
10 complete, it actually won't be completed until we  
11 understand the terms of the licence because those would  
12 need to be incorporated into the plan. There could  
13 certainly be a draft plan completed prior to that. In  
14 speaking with Sio just now, we feel that it would be  
15 appropriate for any municipalities that would like to  
16 provide input into the plan that they have an opportunity  
17 to review the plan prior to finalizing.

18  
19 MS. BORYSKAVICH: Great, thank you.  
20 Now, some of the questions have been covered by Mr.  
21 Clawson, so I don't want to reiterate them, but I do want  
22 to confirm that I have an understanding of what is meant  
23 by minor to moderate noise disruption. So, I -- I would  
24 ask that you please clarify that.

25

1 MS. GIFFORD: So, in terms of the criteria  
2 definition -- oops, Marlene Gifford speaking. In terms of  
3 that criteria table, it is a -- it's a general guideline.  
4 So, when we say minor to moderate, it would effect for  
5 example the closest receptors to the drilling area. Some  
6 people will be closer, and again, not within 10 -- or 100  
7 metres of the actual extraction. So, those residents  
8 might hear more of the sounds of the activities than  
9 somebody a little further away. So, therefore, the -- the  
10 magnitude of the noise would be probably moderate to  
11 minor.

12

13 MS. BORYSKAVICH: Krista Boryskavich.  
14 Thank you. And can you tell me at this point, and I'm not  
15 sure if you've undertaken this work as yet or not, how  
16 many residences fall within the project area?

17

18 MR. SAMOILOFF: Samoiloff, AECOM. We  
19 -- we don't have a number on the actual number of  
20 residences. The shift in the -- the project extraction  
21 areas has resulted in a change in that number. However,  
22 we will provide an undertaking to get that information for  
23 you.

24

25 MS. BORYSKAVICH: Krista Boryskavich.

1 Thank you. And then my follow up question on that, which  
2 you may or may not have the answer for today, is what  
3 would the average distance of these residences be from  
4 potential well clusters?

5  
6 MR. SAMOILOFF: Samoiloff, AECOM. We  
7 can say what the minimum distance will be. So, there will  
8 be a minimum hundred metre distance. As far as the -- the  
9 average, we would need to calculate that, and it would be  
10 based upon negotiations with the landowners because those  
11 distances would be part of that discussion as -- as far as  
12 setbacks.

13  
14 MS. BORYSKAVICH: Okay. Thank you.  
15 Krista Boryskavich. And not to sound to repetitive here,  
16 but I will ask again, what is your process for addressing  
17 any noise issues or complaints that might be raised by  
18 municipalities or effective (inaudible) once the project's  
19 ongoing?

20  
21 MR. SOMJI: Feisal Somji. It -- I think  
22 that answer's the same as the other two in that obviously  
23 open dialogue with the municipality, hotline that anybody  
24 can call if there's any complaints, and -- and ongoing  
25 communication, and -- and -- and -- and likely an

1 agreement between us and them to -- to have a method of  
2 communication.

3  
4 MS. BORYSKAVICH: Thank you. So, I'm  
5 going to move onto a different topic now. The EAP focus  
6 is on that portion of the project area to be mined in the  
7 first four to five years, which is primarily located  
8 around the arm -- or in or around the arm of Springfield  
9 and the surrounding areas. However, you know, either  
10 through your website or through your introductory  
11 presentation you've identified an overall project area and  
12 existing mining claims that extend far beyond that  
13 original four to five year plan. So, you know, for  
14 instance, your website states that I believe there are 390  
15 mining claims over approximately 85,000 hectares of land.  
16 Potential mining, 540 million tonnes of silica sand. Your  
17 introductory presentation provides some different numbers,  
18 but my -- my questions are firstly, are can you confirm  
19 that the land claims that have expired within the past  
20 couple of years have been renewed? Do all of those 390  
21 mining claims referenced on your website, are they still  
22 all in existence?

23

24 MR. SOMJI: Yeah. Under the mining  
25 regulations there's a -- a -- a process to maintain

1 mineral claims in good standing. I don't have the number  
2 in my head, but there's a -- a yearly assessment work  
3 requirement where we have to spend X dollars per hectare  
4 to maintain them. So, all of our current claims as we've  
5 indicated are in good standing.

6

7 MS. BORYSKAVICH: Krista Boryskavich.  
8 Thank you. So, following from that then, would you agree  
9 that there is a likelihood that future extraction  
10 operations will extend beyond the initial area being mined  
11 in the first four to five years into other southeastern  
12 municipalities such as the ones represented by MSSAC?

13

14 MR. SOMJI: Obviously -- Feisal Somji  
15 here. Obviously we'd like to be here more than four  
16 years. We recognize that, you know, applying for four  
17 years as -- as Cliff mentioned allows us for  
18 reassessments, it allows us for continuous learning, and -  
19 - and improvement. It also allows us to look at the  
20 impact of other developments in the area in terms of land  
21 use developments, and -- and at private agreements with  
22 landowners as ownership would change. There is going to  
23 be an economic restriction of the distance we could go  
24 from a facility, from a processing facility and a rail  
25 line to where we could extract from, and -- and that --

1 that final economic outline hasn't yet been determined.  
2 We -- we as a business strategy, of course, like to  
3 maintain a larger land position and show our investigators  
4 that we have a larger resource, but that's a very  
5 different intent to the operations that we would  
6 eventually do. So, operations are really going to be  
7 dictated to within an area that makes economic sense.

8

9 MS. BORYSKAVICH: Okay. Thank you. So,  
10 building on that then I guess, assuming that there will be  
11 some expansion beyond the initial four to five year  
12 project area to be determined, given that the EAP's focus  
13 again is on the project area to be mined within the first  
14 four to five years. Would you agree that you have not as  
15 yet examined impacts including cumulative effects on the  
16 project area located within those additional southeastern  
17 municipalities, or in other words, in the project area  
18 beyond what is to be mined in the first four to five  
19 years?

20

21 MR. SAMOILOFF: Samoiloff with AECOM.  
22 I -- I did speak to the issue of cumulative effects in --  
23 in our presentation, and it is true, we have not completed  
24 what we'd call a formal cumulative effects assessment.  
25 We've considered aspects that would be incorporated into a

1 cumulative effects assessment, but the area outside of the  
2 four to five years has not been, you know, assessed for  
3 the purposes of an EAP. So, with that being said, as we  
4 approach the end of the four to five year period, that is  
5 when we would start looking at -- and completing the  
6 environmental assessment work for areas outside of that  
7 four to five years. It will take some refinement of the  
8 project footprint. We will also be in a position where we  
9 can incorporate much of the information that's obtained  
10 during the first four to five years of operation, whether  
11 it be water quality, water quantity, noise, dust. That  
12 information will be incorporated into as well. So, to  
13 answer the question, we have not done cumulative effects,  
14 but we have started the process of opining the information  
15 that we would use to do the assessment of the future  
16 mining areas.

17

18 MS. BORYSKAVICH: Thank you. Krista  
19 Boryskavich. So, I'm going to refer you to the slide in  
20 your presentation on cumulative impact assessment. You've  
21 set out in the second bullet point under rationale your  
22 position on when cumulative effect assessment are most  
23 relevant, and my question for you with respect to that is  
24 do you agree that contamination or a collapse of the  
25 aquifer system can potentially have substantial adverse

1 environmental effects?

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MS. GIFFORD: Marlene Gifford. Through our panels -- hydro geo, and then geological panels that we have heard from, we don't -- we do not expect significant adverse effects.

MS. BORYSKAVICH: Thank you. And a further point of clarification on that then, and we'll stick with this -- this current slide. So, the hydrogeological panel indicated that they were tasked to focus on the first four to five years of the project when preparing their studies. However, your slide with respect to cumulative effects states that the hydrogeology studies considered the expanded spatial project 24 year. Can you please clarify?

MR. SAMOILOFF: Samoiloff. Yeah. That should be somewhat clarified. I think what I had said is that the expanded spatial area -- well, to start it off, I believe it said we considered aspects of a cumulative effects assessment. What was meant by the expanded spatial scope in the 24 years is that some of the data from the monitoring wells that was incorporated into the model was from locations that fell within that 20 year

1 spatial period.

2

3

MS. BORYSKAVICH: Thank you. Switching  
4 gears a little bit, and I've only got a couple more  
5 questions. You've started in your presentation that one  
6 of the rationales for not seeking a 24 year licence is  
7 that changes may be, and these are your words, "Better  
8 reflected in success of four year environment act  
9 licences." Can you clarify your intent with respect to  
10 future licences? So, will you be applying for new  
11 licences, or simply seeking an alteration to any existing  
12 licences?

13

14

MR. SAMOILOFF: Samoiloff again. The  
15 intent as it is now would be to file for notice of  
16 alterations. However, as we typically will do with any  
17 environmental project that requires a permit or licencing,  
18 we would consult with the regulators, in this case the  
19 environmental approvals branch, and seek their guidance to  
20 whether or not a project would be suitable for a notice of  
21 alteration, or whether a new environment act licence would  
22 be applied for. At this stage, we are anticipating a  
23 notice of alteration.

24

25

MS. BORYSKAVICH: Krista Boryskavich.

1 And thank you for that clarification. I -- I am trying to  
2 not make too much of a comment here, but as I'm sure  
3 you're aware, expanding into a new municipality with an  
4 alteration without a requirement for a public hearing may  
5 limit the municipalities that are impacted from having  
6 participation in that process. So, to that point, and as  
7 well because you know, you've acknowledged in your  
8 presentation, I think we've been speaking about it all  
9 week, that there are still plans with respect to this  
10 project that are to be completed, which may have impacts  
11 on municipal interests. So, what is your plan for long  
12 term engagement and collaboration with municipalities with  
13 respect to input and feedback on the plans that still need  
14 to be developed and implemented, and issues that impact  
15 their (inaudible) on an ongoing basis?

16

17 MR. SOMJI: Feisal Somji. I think, you  
18 know, you're correct in that there's going to be some new  
19 -- new -- new information, there's going to be some new  
20 plans developed. As Cliff has outlined, that's typically  
21 done after a permit has -- has been issued, and that's  
22 normal course for all mining projects. As we said before,  
23 we'll -- we'll continue with open dialogue with the RM's.  
24 We've committed to one of the monitoring plans being  
25 provided in draft for -- for review, and we're happy to

1 provide all the monitoring plans in draft for the RM's  
2 review, and -- and input and comments.

3

4 MS. BORYSKAVICH: Thank you. That's all  
5 the questions I have for you at this time. Thank you.

6

7 THE CHAIRMAN: Chair. Thank you very  
8 much. I was about to intervene and say your 30 minutes  
9 has expired, but you have a great sense of time. It is  
10 five minutes to three. I would suggest we take a 10  
11 minute break, and we'll get right back at it. Thank you.

12

13 (OFF RECORD)

14 (ON RECORD)

15

16 THE CHAIRMAN: Chair. Okay. We're  
17 almost ready to go. If I could just get Brent back to the  
18 front, we're good. Okay, Byron, are you ready?

19

20 MR. WILLIAMS: I'm just wondering if  
21 all the panel is present, Mr. Chair.

22

23 THE CHAIRMAN: Ah. Good call.  
24 Quorum is three. We're technically good. But hang on,  
25 let's just wait. No -- one -- my quorum just walked out

1 the door. Chair. All members of the Commission have been  
2 found. You're in business, Byron. Your challenge before  
3 you is to not repeat a single question of the -- those  
4 that came before you. I'm just kidding.

5  
6 MR. WILLIAMS: Thank you, members of  
7 the panel and -- it's always great to be the last person  
8 asking Cross-Examination at the end of a long week, so --  
9 Williams speaking. Mr. Samoiloff, in your direct evidence  
10 earlier today, you ventured some comments on cumulative  
11 impact assessment. You recall that, sir?

12  
13 MR. SAMOILOFF: Samoiloff. Yes, I do.

14  
15 MR. WILLIAMS: Excuse me. Williams.  
16 And just to be clear, sir, you are not presenting yourself  
17 as an expert in cumulative impact assessment, sir?

18  
19 MR. SAMOILOFF: Samoiloff. That is  
20 correct.

21  
22 MR. WILLIAMS: In terms of --  
23 Williams speaking -- in terms of the two Sio Silica  
24 projects, one being the processing project, one being the  
25 extraction project -- sir, for purposes of clarification,

1 the Sio Silica sand processing project includes a rail  
2 loop and interconnection with the Canadian National  
3 Railway. Is that correct, sir?

4

5 MR. SAMOILOFF: I believe that we  
6 indicated that the facility project is outside the scope  
7 of the extraction project.

8

9 MR. WILLIAMS: Sir, you recall giving  
10 evidence about project splitting earlier today? Agreed?  
11 Williams.

12

13 MR. SAMOILOFF: Samoiloff. Yes, there  
14 were.

15

16 MR. WILLIAMS: And just so I'm clear.  
17 If you're venturing an objection to this question, I'm not  
18 questioning you about the split (inaudible). My question  
19 will go to whether the project -- the impacts of that --  
20 of the other projects should be considered in accumulation  
21 with the processing -- with the extraction project. Just  
22 so you know that I'm not trying to revisit the licensing  
23 decision, okay?

24

25 MR. SAMOILOFF: Samoiloff. If the

1 question is asking me if I feel that there is a  
2 requirement to consider the facility project -- sorry,  
3 just let me finish. Samoiloff again. If you're asking me  
4 if the facility project should be considered in the  
5 assessment of the extraction project, I would say it is  
6 not a requirement.

7

8 MR. WILLIAMS: Williams speaking.  
9 Let's start with the fact that you have not considered the  
10 effect of the processing facility in combination with the  
11 -- the extraction project, the cumulative effect of that  
12 as part of your impact assessment. Agreed?

13

14 MR. SAMOILOFF: Samoiloff. The -- the  
15 traffic projection was considered, but you're correct.  
16 Cumulative effects was not -- effects -- other effects  
17 were not considered.

18

19 MR. WILLIAMS: Thank you. Williams  
20 speaking. So, let's just back up a second. You will  
21 agree that the Silica extracted from the extraction  
22 project will be transmitted to the Sio Silica facility  
23 project on transmission lines or pipes from the extraction  
24 project. Agreed?

25

1 MS. GIFFORD: Marlene Gifford. Can you  
2 clarify the context of the transmission line that you're  
3 speaking of?

4  
5 MR. WILLIAMS: I'm in my hydro  
6 headset, not in my silica headset. But you'll agree  
7 you're extracting silica from the sand and you're  
8 transmitting it through your extraction project to the  
9 processing facility. Agreed?

10  
11 MS. GIFFORD: Marlene Gifford. Just to  
12 clarify. The sand is being transported as a slurry of  
13 water and sand in -- in pipes to the facility, but are you  
14 -- can you clarify if you think that the slurry line is  
15 going along the existing transmission line?

16  
17 MR. WILLIAMS: No. That was just Mr.  
18 Williams getting -- having a hydro head on rather than a  
19 silica head. You've answered my question to that degree.  
20 And your CEO obviously has also made it clear that there  
21 is an intimate financial and economic connection between  
22 the extraction project and -- and the processing facility.  
23 Agreed, sir?

24  
25 MR. SOMJI: Feisal Somji. I think you'd

1 have to define what you mean by intimate.

2

3 MR. WILLIAMS: Williams speaking.

4 Earlier today, sir, you said that the ambit of your  
5 extraction project, one of the key elements -- parameters  
6 of that will be the distance from the production facility.  
7 Agreed?

8

9 MR. SOMJI: Feisal Somji. Yeah. You  
10 know, as -- as Cliff outlined at the start of our  
11 presentation, we do believe that one project can -- can  
12 exist economically without the other. Our preference is  
13 to combine the two, but they are not, I would say, as you  
14 say, intimately connected or reliable -- reliant on each  
15 other.

16

17 MR. WILLIAMS: Williams speaking.  
18 And thank you for that. You would agree though that the  
19 ambit or distant or the extent of your extraction project  
20 is conditional and limited by potential distance from the  
21 production facility. Agreed? You gave testimony about  
22 that earlier today.

23

24 MR. SOMJI: Feisal Somji. I -- you know,  
25 I talked about the distance from the processing facility,

1 and I also said from rail. It is a bulk commodity in  
2 which we have to move by rail, so distance to rail is --  
3 also plays a part in the economic analysis.

4

5 MR. WILLIAMS: Fair enough. Williams  
6 speaking. But distance to the production facility does as  
7 well, agreed?

8

9 MR. SOMJI: Feisal Somji. I think just  
10 access to rail is probably the primary economic  
11 consideration, because as I said, there is a market for  
12 the material without processing. Distance to the  
13 processing facility would take secondary to the distance  
14 to rail.

15

16 MR. WILLIAMS: Williams speaking, and  
17 just to close this off, secondary but not irrelevant, sir.  
18 Agreed?

19

20 MR. SOMJI: Feisal Somji. It -- it  
21 definitely plays a part of the consideration.

22

23 MR. WILLIAMS: Williams. Thank you,  
24 sir. Turning to about Page 18, it's the slide on  
25 cumulative impact assessment. Mr. Samoilloff, backing away

1 from that immediate slide for a second, you'll recall,  
2 obviously, that you've prepared a list of references for  
3 your EAP, which appears at -- between Page 109 and 113 of  
4 your document. Agreed?

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MR. SAMOILOFF: Samoiloff. Yes, that  
is correct.

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MR. WILLIAMS: And sir, your list of  
references for the Environmental Assessment, or EAP, does  
not include the Clean Environment Commission Report,  
Manitoba Clean Environment Commission Report on Public  
Hearing, Pembina Valley Water Cooperative, Supplemental  
Groundwater Supply System from 207. Agreed?

MR. SAMOILOFF: Samoiloff. Sorry,  
what was the date on that?

MR. WILLIAMS: Williams speaking.  
I'm suggesting you didn't include or reference the CEC  
report on Pembina Valley from 207. Agreed?

MR. SAMOILOFF: Samoiloff. That's  
correct. It is not included in the references.

1 MR. WILLIAMS: And sir, in your list  
2 of references you do not include the Clean Environment  
3 Commission Report, Report on Public Hearing, Red River  
4 Floodway Expansion 205. Agreed?

5

6 MR. SAMOILOFF: Samoiloff. That's  
7 correct.

8

9 MR. WILLIAMS: Williams. And mindful  
10 of those last two answers, would it be fair to suggest  
11 that in preparing your Environmental Assessment, you did  
12 not have reference to the advice of the Clean Environment  
13 Commission, if any, on cumulative effects assessments in  
14 those two reports?

15

16 MR. SAMOILOFF: Samoiloff. Could you  
17 repeat the question, please?

18

19 MR. WILLIAMS: Williams. In  
20 preparing -- and I can't repeat the question but I'll --  
21 I'll do a facsimile of it. Williams. In preparing your  
22 EAP, you did not have reference to the advice and  
23 recommendations of the Clean Environment Commission, if  
24 any, on cumulative effects assessment from those two  
25 reports. Agreed?

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MR. SAMOILOFF: Samoiloff. So, at the time of the EAP preparation, you know, cumulative effects was not a requirement as far as preparing the EAP and therefore, no, we don't believe that it's part of this review. The debate whether we should consider cumulative effects is kind of -- not for us to respond to in this hearing.

MR. WILLIAMS: Sir, just so I understand -- and you can answer my question if you'd like now. In terms of your EAP, you did not have reference to the comments of the of the Clean Environment Commission on cumulative effects assessment. Fair statement?

MR. SAMOILOFF: Somoiloff. We're not -- we did not consider them relevant to the scope of that particular assessment.

MR. WILLIAMS: Thank you. To the panel, we have shared through Sio Silica's legal counsel excerpts from our submission and the MSAC submission on prior CC decisions. And Mr. Samoiloff, just as a starting point, have you reviewed that document, which is -- the front page says "Pembina Valley Water Cooperative,

1 February, 207"?

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MR. SAMOILOFF: Samoiloff. Yes, it  
has been reviewed.

MR. WILLIAMS: And sir, just in  
fairness, you understand that within that document, there  
are excerpts from four different Clean Environment  
Commission Reports, including Pembina Valley By-poll 3, a  
review of the regional cumulative effects assessment, and  
finally, the Red River Floodway Expansion?

MR. SAMOILOFF: Sorry?

MR. WILLIAMS: You understand that,  
sir?

MR. SAMOILOFF: Samoiloff. I  
understand that the references are there and I'm still of  
the opinion that cumulative effects is not relevant, even  
based upon those references.

MR. WILLIAMS: That's the answer I'm  
looking for, sir. Thank you. And recognizing that there  
is additional guidance in these excerpts I've shared with

1 you, including from the By-poll 3 proceeding and the RCEA,  
2 Regional Cumulative Effects Assessment, it would be a fair  
3 statement that in preparing the EAP, you did not have  
4 reference to the guidance or advice of the Clean  
5 Environment Commission on cumulative effects from those  
6 two reports?

7  
8 MR. SAMOILOFF: Samoiloff. That -- it  
9 kind of feels like we're going around in circles here, but  
10 let me just provide a bit more insight into why we felt  
11 that that information wasn't relevant to our assessment,  
12 and I'll start with the Pembina Valley project. The --  
13 there are some similarities between this and the Pembina  
14 Valley project, being that they are both considered Class  
15 2 developments. Both of them do require the removal of  
16 water to some extent, but that's sort of where the  
17 similarities end. This project is temporary in nature  
18 whereas Pembina Valley had permanent structures.  
19 Therefore, we didn't feel that it was applicable. This  
20 project is -- has a relatively small footprint, whereas  
21 Pembina Valley included not just the pumping systems, but  
22 almost 100 kilometres of pipeline as well. So we didn't  
23 feel that that was relevant to this project. And in  
24 addition -- and probably -- no -- fairly important, is  
25 that Pembina Valley was the removal of water for the

1 purposes of a backup -- backup municipal water and so  
2 forth, whereas this project is the almost complete return  
3 of the water back to the aquifer. So there is no  
4 substantial net withdrawal as opposed to Pembina Valley  
5 which did have a substantial withdrawal.

6  
7 MR. WILLIAMS: Thank you. Williams  
8 speaking. And sir, just a couple more questions about  
9 Pembina Valley. You do know that it related to the  
10 aquifers of the Sandy Land glacial fuel -- glacial fluvial  
11 complex. Agreed, sir?

12  
13 MR. SAMOILOFF: Samoiloff. Agreed.

14  
15 MR. WILLIAMS: And sir -- just --  
16 sorry?

17  
18 MR. SAMOILOFF: Just to add one more  
19 to that -- it -- and again, it involved the removal of  
20 water, not the return of water.

21  
22 MR. WILLIAMS: And sir, just  
23 directing your attention specifically to Page 48 of that  
24 decision, which is highlighted in yellow. Sir, directing  
25 -- Williams speaking -- your attention to the last

1 sentence, you're aware that the context of the statement  
2 from the Clean Environment Commission was an observation  
3 that the ecosystems in the area are currently affected by  
4 other developments and activities in the region and  
5 consideration of the additive effect of another impact  
6 needs to be addressed. You're aware that was ---

7

8 MR. DUNCANSON: Mr. Chair? Sander  
9 Duncanson. I'm a bit concerned with where these questions  
10 are going. I've let my friend go down a bit of a path  
11 here just to see how far we're going, but the witnesses  
12 have explained why cumulative effects -- why a formal  
13 cumulative effects assessment was not done for this  
14 project. They've explained that these documents that my  
15 friend is referring to were not in any way relied on in  
16 the assessment. Obviously we're not here to talk about  
17 the projects that are considered in these reports. Mr.  
18 Samoiloff just explained why, at least this one project,  
19 is materially different than the project in consideration  
20 in that proceeding. So I don't think it's a fair question  
21 to this panel to ask them to comment on CEC  
22 recommendations to government in other proceedings.

23

24 MR. WILLIAMS: Mr. Chair, mindful of  
25 that, I'll direct my attention to the second bullet on

1 this slide. And Mr. Samoiloff, you make the suggestion  
2 that cumulative effects assessments are most relevant for  
3 large projects. Agreed?

4

5 MR. SAMOILOFF: Samoiloff. It's in  
6 the presentation, so I would have said that, yes.

7

8 MR. WILLIAMS: And prior to making  
9 that statement, sir, did you explore whether or not Class  
10 2 developments like forest management plans exercise  
11 cumulative impact assessment?

12

13 MS. GIFFORD: Marlene Gifford. Can you  
14 clarify?

15

16 MR. WILLIAMS: First of all, I  
17 apologize for clicking the button, too, so if I  
18 interrupted you, Ms. Gifford, I apologize. In making that  
19 statement and recognizing that you're not an expert in  
20 cumulative effects assessment, did you explore whether the  
21 practice in Manitoba is to require cumulative effects  
22 assessments for Class 2 projects like forest management  
23 plans? Did you explore that question?

24

25 MR. SAMOILOFF: Samoiloff. I don't --

1 I don't follow your rationale on how that would be  
2 relevant to this particular assessment.

3

4 MR. WILLIAMS: Sir, you've made an  
5 observation recognizing that you do not have expertise in  
6 this area of where cumulative effects assessments are most  
7 relevant, and my question was, as a foundation for that  
8 statement, did you explore the practice in Manitoba for  
9 Class 2 projects like forest management plans?

10

11 MR. SAMOILOFF: Samoiloff. I didn't  
12 explore it specific to forest management plans, I explored  
13 it specific to other Class 2 developments which would  
14 include other mining projects.

15

16 MR. WILLIAMS: Mr. Samoiloff, in  
17 terms of the Clean Environment Commission, would it be  
18 your understanding that the CEC, or Clean Environment  
19 Commission, is independent and stands at arms length from  
20 the Minister and the Department?

21

22 MR. SAMOILOFF: Samoiloff. I'm sorry,  
23 could you repeat the question? I was mildly distracted  
24 there.

25

1 MR. WILLIAMS: My questions are that  
2 bad this afternoon, hey, Mr. Samoiloff? Would it be your  
3 understanding that the Clean Environment Commission stands  
4 at arms length from the Department?

5  
6 MR. DUNCANSON: Mr. Chair, Sander  
7 Duncanson. I think there's aspects of that question that  
8 involve understanding of the law, which these witnesses  
9 don't have, but separate from that, I'm struggling to see  
10 how that question is relevant to the ---

11  
12 THE CHAIRMAN: Sorry, I cut you off.  
13 Chair. I concur. Mr. Williams, where are you going with  
14 it?

15  
16 MR. WILLIAMS: The inference that the  
17 proponent appears to be making, Mr. Chair, is that the CEC  
18 is somehow bound, not by the law, not by the regulation,  
19 but by guidelines of the Department, and the question I'm  
20 posing is whether the proponent understands that the CEC  
21 stands at arms length from the Department.

22  
23 THE CHAIRMAN: Chair. Fair question.  
24 So, can you please respond?

25

1 MR. DUNCANSON: Mr. Chair, just while  
2 the witnesses are conferring, this is Sander Duncanson.  
3 My view is most of what Mr. Williams just described is  
4 actually a legal argument and something that we can debate  
5 in a few weeks in terms of what is -- how the CEC may or  
6 may not be legally bound by decisions from the department.  
7 I think what the witnesses can speak to is, based on their  
8 experience, what is required for an EAP such as this.

9

10 MR. WILLIAMS: Mr. Chair, I'm happy  
11 to move on. I'm mindful it's a Thursday. It said -- I  
12 will simply say on the record our statements by the  
13 proponent that lead to that inference, but I'm happy to  
14 move on.

15

16 THE CHAIRMAN: And I will note, you  
17 have seven minutes left. Chair.

18

19 MR. WILLIAMS: My next two questions,  
20 which are final questions and at the request of my  
21 clients, are directed to Sio Silica, Mr. Feisal. And I  
22 have shared them with my learned friend. Sir, you don't  
23 need to turn there, but if you wish to in your -- in the  
24 company overview, you referenced some of the applications  
25 for high purity silica. Do you recall that, sir?

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MR. SOMJI: Feisal Somji. Yes.

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MR. WILLIAMS: And I apologize for calling you Mr. Feisal, Mr. Somji. My apologies, it's late. Williams speaking. And sir, from the perspective of your corporation, can you confirm that these are all the applications for the silica that you intend to explore?

MR. SOMJI: Yes. All the applications for high purity silica actually extend past this list, but these are examples, and these are the major applications. The most common ones.

MR. WILLIAMS: And sir, you're aware of concerns, and we heard you on the first day, about the use of high purity silica for activities associated with fracking? You're aware of those concerns, sir?

MR. SOMJI: I am aware of the concerns, yes. I would just want to clarify that high purity silica is not what's required for the energy industry for fracking. It's more size and roundness and hardness of a grain of sand.

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MR. WILLIAMS: And sir, would some of the products that come from your extraction activities, apart from high purity silica, be potentially used in the fracking industry?

MR. SOMJI: Feisal Somji. The product that's here could be used, but there is absolutely no intention or desire by the company for it to be used in the energy industry for fracking or other energy uses.

MR. WILLIAMS: Thank you. And just the final question which, again, I've shared with my friend and comes directly from our clients. Would Sio be supportive of new legislation to oppose the use of silica for hydraulic fracking?

MR. SOMJI: Feisal Somji. I -- you know, I don't think it's our place to be supporting any actions that affect a broader industry outside of us that we're -- have no involvements with. So I think it's prudent for us to stay focused on what we're focused on, which is high purity silica used for applications like what was presented on my slide.

1 MR. WILLIAMS: Mr. Chair, thank you,  
2 and I do thank the panel. Thank you very much.

3  
4 THE CHAIRMAN: Chair. Thank you very  
5 much. Next we have -- the Commissioners would like to ask  
6 questions, and all three of them have indicated that they  
7 have at least a question, so in the order that they tapped  
8 me on the shoulder. Commissioner Johnson?

9  
10 MR. JOHNSON: Thank you, Mr. Chair. Terry  
11 Johnson speaking, Commissioner. I have three short  
12 questions that I would like to pose to the panel. And the  
13 first question is this. Have you characterized the waste  
14 stream that remains above ground and to the point where  
15 you will know where it will be disposed of and what level  
16 of facility will this be disposed into?

17  
18 MR. SAMOILOFF: Samoiloff, AECOM. At  
19 this point, we have to look up the volumes. We do know  
20 how waste materials will be characterized. We have a  
21 waste characterization plan in place -- draft at this  
22 point. That will be updated. We know what materials we  
23 would consider as waste and we had earlier discussions  
24 with respect to acid generating potential and metal  
25 leeching potential. Any material that we feel would meet

1 that criteria would be segregated in storage that's  
2 protected from the elements. It would then be transported  
3 to a licensed hazardous waste facility by a licensed  
4 contractor. Although there's been no sort of detailed  
5 discussions with any particular waste hauler, an example  
6 would be the facility that's run by Miller Environmental  
7 in Saint Francis Xavier. Final disposal location will be  
8 based upon the nature of the contaminated material.

9

10 MR. JOHNSON: Thank you for that answer.  
11 Just as a sub-answer to that, like, I come from Virden,  
12 Manitoba, which is the oil capital of this province, and  
13 I'm somewhat familiar, from both from a municipal point of  
14 view and from an on the ground -- actually on the leases  
15 and drill cuttings and stuff like that are hauled out of  
16 there and then moved to a Level 3 facility at the site  
17 directly north of Virden, Manitoba, as they are across all  
18 the southern region around through there. And I just  
19 thought that maybe you would have a better idea at this  
20 point in time as to how you're going to manage the waste  
21 streams that are left above ground.

22

23 MR. BULLEN: It's Brent Bullen with Sio  
24 Silica. I appreciate the parallel to Vernon, but as you  
25 know, with conventional oil and well drilling, you're

1 using actual drilling fluids that might actually have  
2 either high salinity or invert fluid oil based. They're  
3 highly contaminated, they're highly difficult for the  
4 environment, so obviously they have to be fully contained.  
5 You know, here we're dealing with -- they're -- most of  
6 the water wells, probably almost every single one in  
7 Manitoba, has had discharge of cuttings just to surface  
8 because there's -- it's water and marginal cuttings.  
9 We've taken the waste characterization to a point where  
10 we're not going to put anything on the ground, not even  
11 the overtill. We'll keep that separated.

12

13 THE CHAIRMAN: Thank you for that  
14 answer. I have another observation to hear borne out of  
15 the what's happened in the oil patch that may have  
16 application for your lease sites, and that is the normal  
17 practice of using skid pads. And those are normally used  
18 on lease sites, and they afford protection of the land  
19 around the drilling activity and the municipal roads such  
20 that the land isn't scarred up, and it makes the  
21 operations much more efficient as well. Have you  
22 considered the use of skid pads on your lease sites to  
23 alleviate the environmental impact?

24

25 MR. BULLEN: Brent Bullen, Sio Silica. I

1 think we're probably talking about the same thing. I  
2 would actually call them an access mat. So we either have  
3 access matting, which you would see -- they've done it  
4 with the hydro transmission lines. Typically, that  
5 actually takes barrier separation between any type of  
6 equipment and the actual ground source below. It allows  
7 the pads to be cleaned so there's not a contamination of  
8 soil from site to site. And then around the rig  
9 locations, you can use larger matting which is actually  
10 structural, for support. Whether it's a 2-3 or four beam  
11 access mat or rig mat, they would call it, and we've  
12 actually deployed those in our exploration activities and  
13 in both access matting and matting that protects the  
14 weight of the rig from the ground, so that we preserve the  
15 ground, and we indicated that in our plans to use that.

16

17 THE CHAIRMAN: Thank you for your  
18 answer. I just have one small question or observation  
19 here, with regards to the flow chart here for the CESF  
20 operation. I guess I'm more tactile, visual person, and  
21 I'd just like some explanation as to where this fits into  
22 the overall scheme of things. I see product coming in and  
23 I see product going out. Could you perhaps enlighten me  
24 as to where the UV filters might exist, prior to this  
25 operation or after? And also, would this type of

1 equipment be mounted in skid units that they would just be  
2 skidded from site to site, either vis-à-vis a trailer or  
3 they'll just be skidded on the ground? Give me some sense  
4 of how the lease site will function that way.

5

6 MR. BULLEN: We just want -- just  
7 clarification. Sorry, Brent Bullen. Is this the one  
8 you're looking at? Or the one up on the screen?

9

10 THE CHAIRMAN: The one up on the  
11 screen.

12

13 MR. BARKH: Mohsen Barkh, Recens. Thank  
14 you for your question. Basically, this is only part of  
15 the treatment facility. In the general, we have one  
16 physical separation of the coarse material either by  
17 filter press or by gravity system. Then the overflow from  
18 that system comes to these containerized mobile units,  
19 that they call the CESF units, and the outflow from here  
20 is the one that feeds into the UV or next level of the  
21 treatments. So basically, the only purpose of the using  
22 chitosan and this CESF unit is removing the fine material  
23 that might distract the final treatment with the UV.  
24 Because, as you might know, if you have a small particle  
25 in the water, they might shield UV ray and basically

1 prevent the -- sterilizing the water. So the way that we  
2 are working here, we try to remove fine material as much  
3 as possible to reduce the shielding effect on the UV  
4 operation, so that the pre-treatment for the UV, and could  
5 be pre-treatment for anything else that you might see in  
6 the water. For example, if you have a hydrocarbon or  
7 metal or something like this, again, this system, by  
8 removing the suspended solid, reduce the load on the next  
9 unit operation. I hope I give the clear answer to your  
10 question.

11

12 THE CHAIRMAN: Chair. Commissioner  
13 Johnson, are you done? Thank you. Commissioner Streich?

14

15 MS. STREICH: Thank you, Mr. Chair. Laurie  
16 Streich, Commission member. Actually, Terry just asked  
17 one of my main questions on this process, how it fit into  
18 the UV treatment. But I was also wondering -- I note that  
19 it is derived from crab and shrimp cells (sic) -- shells,  
20 and whether that has any effect on the quality of the  
21 water that comes out of the wells later.

22

23 MS. WEEDEN: This is Laura Weeden ---

24

25 MS. STREICH: Whoops, sorry.

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MS. WEEDEN: Tricky. I just wanted to clarify, because I think what I heard in that question that Mr. Johnson asked, was spatially where this system will be located in all of our operations and not just how it works. And I just want to clarify that this system, along with the UV, is sort of like a an intermediary station that will be moved once or twice a season. It's designed to be mobile. But it's going to be located near the extraction rigs, it's not going to be at the facility, and it won't be directly attached to every rig. So it won't have to be moved every single time. So it's more like, centrally located for the season.

MR. BARKH: Mohsen speaking. Could you repeat your question now?

MS. STREICH: Yes, Laurie Streich, Commissioner. The question I had was in relation to a substance that's derived from the crab and shrimp shells and whether that has any effect on the quality of the water.

MR. BARKH: Mohsen speaking. Basically, the origin of the material that we are using is the --

1 exoskeleton or shell of the shrimp or crab. But there is  
2 six to nine unit operations between having this material  
3 and converting to the kind that they are using in the  
4 system. So the answer is, basically, in this unit  
5 operation, including five or six time of the washing with  
6 different material and all of the research that done until  
7 now, shows that there is no negative impact of using this  
8 material either in drinking water or in industrial water  
9 treatments.

10

11 MS. STREICH: Okay. Thank you very much.

12

13 THE CHAIRMAN: Chair. Thank you.  
14 Over to Commissioner Gillies.

15

16 MR. GILLIES: Ian Gillies, Commissioner. I  
17 have a question on wildlife impacts, particularly birds.  
18 I was happy to hear that there will be no vegetative  
19 clearing during bird nesting season, but I'm kind of like  
20 Terry. I would like to better understand the way that the  
21 slurry pipes are repositioned, as each well is  
22 commissioned, extraction proceeds, and then the slurry  
23 pipes move on to the next well. Will the slurry lines be  
24 basically rolled across the terrain or are they wound up  
25 on spools and transported to the next site and then

1       reinstalled?

2

3                   MR. BULLEN: Brent Bullen, Sio Silica. So  
4       the methodology we look at for the transportation of the  
5       slurry loop is to set out a main raceway, early in the  
6       season, of main lines that we would then feed to from the  
7       satellite extraction components. Those main lines will be  
8       set across either down with the permission of the RM and  
9       working with them in the ditches, much like they do high  
10      density polyethylene lines for the movement of animal  
11      manure for fertilization here -- or on private land with  
12      land owner access agreements that allow us to put the main  
13      transmission lines on. Within the actual extraction  
14      methodologies, when we bring the sand and slurry to  
15      surface and do the separation and the sand is then  
16      introduced into the slurry loop, it'll be a series of  
17      collectors that are basically building blocks that you can  
18      connect and interconnect to the main lines. And so those  
19      are highly movable lines that can be put in place from pad  
20      to pad. And so the main transmission lines are thought  
21      out for the year's activity and then we look at, over the  
22      course of a quarter section, how we'll go from pad to pad  
23      and just shorten the lines as we come through and move  
24      them in, and then do the pick up that way.

25

1 MR. GILLIES: Ian Gillies, Commissioner. So  
2 what -- my concern here is ground nesting birds. There  
3 are a lot of species of them in in this zone. So I've  
4 been -- I -- do I understand that the lines that go to the  
5 particular extraction wells from the main line are rolled  
6 up and then redeployed to the next bell? Or do you simply  
7 swing the slurry line across the terrain?

8  
9 MR. BULLEN: The line is -- Brent Bullen,  
10 Sio Silica. The lines themselves are -- because they're a  
11 hardline, you pick them up and move them. With respect to  
12 nesting birds, obviously the routing and everything will  
13 be planned ahead of time so that we're not looking at  
14 taking down vegetation on those lines or moving in. So,  
15 those applications where we're going through an area where  
16 there may be marginal clearance of overburden material,  
17 that has to be done outside of the nesting season, so  
18 that'll be taken into consideration. But the segments are  
19 picked up and moved and re-fused together on the piping.

20

21 MR. GILLIES: Thank you.

22

23 THE CHAIRMAN: Chair. Thank you,  
24 Commissioners. Hartmut, over to you.

25

1 MR. HOLLANDER: Yes, thank you very  
2 much. Hartmut Hollander. I have a question on the  
3 filtration process. Is it correct that you expect that  
4 particles smaller than five micrometres will stay in the  
5 solution?

6  
7 MR. BARKH: Mohsen from Recens. No.  
8 Basically, the fine particle would be absorbed to the  
9 chitosan and converted to the larger particle. And then  
10 as I said the filter can remove five micron. It means the  
11 collection of the small particles in the flocculant form  
12 will be removed as five micron. And as I mentioned, we  
13 can add additional filters such as bag filter or cartridge  
14 filter to reduce the number from five micron even to lower  
15 percentage or lower size of the particle, if it's  
16 necessary.

17  
18 MR. HOLLANDER: So, which kind of  
19 particle do you expect to pass a filter?

20  
21 MR. BARKH: Mohsen from Recens. Normally,  
22 we can expect submicron particle if there is any, and this  
23 is a function of the particle size distribution. But  
24 based on our experience with the system, we are seeing  
25 something less than 25 micron and we can reduce the --

1       sorry, 25 NTU, and we can reduce that to something around  
2       five.

3

4                       MR. HOLLANDER:        So, you say that the  
5       water which leaves this filtration process is somewhere  
6       between 5 and 25 NTU.  Is that correct?

7

8                       MR. BARKH:    Mohsen speaking.  Yes.

9

10                      MR. HOLLANDER:        Hollander,       Hartmut.  
11       If you have turbidity and we talk about UV treatment  
12       afterwards, can UV treatment go through these particles  
13       which are the basis for the NTU's or the -- for the  
14       turbidity?

15

16                      MR. BARKH:    Mohsen speaking.    Could you  
17       repeat your question slowly?

18

19                      MR. HOLLANDER:        Hartmut        Hollander.  
20       So, when there is some turbidity left, that means we have  
21       particles left inside the water.  And you use UV  
22       treatment.  Is UV treatment -- works as correctly when  
23       there is still particles in the water?

24

25                      MR. BARKH:    Mohsen speaking.  The way of -

1 - to determine if the UV work properly or not, if you're  
2 using (inaudible) test, review transmission test, and  
3 basically that's the way that you measure if the system  
4 can work or not. And that's just basically dictated us  
5 the number of NTU or acceptable turbidity in the water.

6

7 MR. HOLLANDER: So when you conclude  
8 this, what do you expect in terms of coliforms leaving the  
9 treatment plant after UV treatment?

10

11 MR. BARKH: Mohsen speaking. Coliform  
12 basically have to be in the source water, so depending on  
13 what we have. Normally with the UV, we can go up to log  
14 three, which is 99.9 percent removal for the coliform and  
15 is dependent to intensity and the time that we are  
16 applying UV to the water.

17

18 MR. HOLLANDER: My final question in  
19 this area would be, you have on the -- I'm sorry, you  
20 didn't have the slide number. They -- the version which  
21 we had in the beginning -- (inaudible) system, there's a  
22 quality control inside. Can you tell me which kind of  
23 measurements and how often do you do this -- in there?

24

25 MR. BARKH: Mohsen speaking. Normally, we

1 have pH control and turbidity control as the standard in  
2 our system. However, the system is adjustable and  
3 flexible and we can add more items such as TSS or anything  
4 else that we can measure online. In addition, we can do  
5 the measurement in the clarifier and in the frack tank at  
6 the end of the process as an offline measurement. So if  
7 required, we can put some additional time at the end, hold  
8 the water, send it for the full analysis and then when we  
9 have the satisfactory result, we can discharge the water  
10 or we change it.

11

12 MR. HOLLANDER: Maybe just to clarify  
13 the last answer -- Hartmut Hollander. Means online  
14 parameterization that you constantly measure these values?

15

16 MR. BARKH: Mohsen speaking. When you're  
17 speaking -- when you are talking about the online  
18 parameters -- quality, quantity, flow rate, pH, durability  
19 are the standard in our system. TDS is another one that  
20 we can measure and there is another system that we can add  
21 it to the end of the system, in the end of the unit, from  
22 other subcontractor. Then we can change the other or add  
23 other parameter that we can measure online.

24

25 MR. HOLLANDER: Yes, that is what you

1 said before. Just asked about the time interval. So,  
2 continuous means, do you do this every minute, every five  
3 minutes, every hour, every once a day?

4  
5 MR. BARKH: Mohsen speaking. The standard  
6 procedure in our unit is 15 minutes. However, it is a PLC  
7 control and we can reduce it to five minutes or less, then  
8 all that are going to be logged and if there is two  
9 discrepancy in a row, the system will start to give us an  
10 alarm.

11  
12 MR. HOLLANDER: Thank you very much  
13 for those answers. I have some questions left. Hartmut  
14 Hollander for the permitting team, which is based on the  
15 slide for the progressive closure and rehabilitation plan  
16 under Point 2. You mention here the well is here to  
17 prevent vertical movement between aquifers. Yesterday --  
18 the day before, we discussed and the geotechnical team and  
19 also the hydrological team agreed to this (inaudible). So  
20 this shale will fail. How do you want to seal a well  
21 effectively, based on your rehabilitation plan, when there  
22 is no shale?

23  
24 MR. BULLEN: Brent Bullen, Sio Silica.  
25 Within the actual wellbore that is in place, you still

1 have a well bore, even with an upper void collapse, which  
2 is cemented into the limestone. That wellbore can be  
3 sealed with a mechanical plug at the end and then you put  
4 a cement plug on top, secondary cement plug with the  
5 verification of it. And there's a methodology that are  
6 defined for abandoning that wellbore to surface, including  
7 a cut off in a cement pad in location. With respect to  
8 the areas where you've got a failure point of the shale,  
9 that would still be a room and pillar component that would  
10 be open.

11

12 MR. HOLLANDER: Yes, so the -- I  
13 agree, thank you very much. Hartmut Hollander. I agree  
14 that there will be some room between the two aquifers  
15 which will be open, and still, I'd -- we know we have  
16 discussed this morning, too, that's -- water will be  
17 exchanged. There will be some of your chemistry going on  
18 and the well is not sealed. You can see it to the  
19 surface. I agree to that, but sealing inside the  
20 limestone will not be possible because we saw yesterday  
21 that your limestone has hydraulic conductivity of some  
22 five, ten -- two times ten to (inaudible) five metres per  
23 second, so water will just flow around such a plug and the  
24 trail is not there anymore?

25

1 MR. BULLEN: I apologize. Can you ask the  
2 question again?

3

4 MR. HOLLANDER: I just would like to  
5 know, again, when there is no shale formation, how do you  
6 want to prevent water flowing from one aquifer to the  
7 other?

8

9 MR. BULLEN: With all respect, I'm --  
10 that's not my technical background. That would actually  
11 be for the previous panel that was on to discuss the water  
12 and the chemical properties and the interaction.

13

14 MR. HOLLANDER: This session is about  
15 permitting. The topic is, here, progressive well  
16 (inaudible) plan in accordance with the Groundwater and  
17 Water Well Act. So I'd like to hear from the permission  
18 and permitting team how this is possible.

19

20 MR. SAMOILOFF: Samoiloff, AECOM. We  
21 mentioned these plans because we anticipate them to be  
22 submitted as part of the license conditions. So we have  
23 identified them as plans that will support the EAP. We  
24 feel it is probably not appropriate to comment on  
25 questions specific to the plan because they were addressed

1 in previous panels and we don't have the specialists or  
2 experts up here to provide an answer for you.

3

4 MR. HOLLANDER: Thank you for that.  
5 On one of the large slides, Ms. Weeden showed that the  
6 groundwater monitoring and impact mitigation plan, and  
7 also the progressive well and bonding plan, are submitted  
8 in draft to the Commission. Can you maybe just explain  
9 shortly what is the intention of Sio Silica in this  
10 direction to seal the wells between two aquifers where  
11 there's no aquitard anymore?

12

13 MR. DUNCANSON: Mr. Chair, Sander  
14 Duncanson. And just while the panel's conferring, I think  
15 what the panelists are struggling with a little bit is,  
16 while those plans were listed on one of the slides for  
17 today, the details of those draft plans really are the --  
18 a matter of technical experts related to groundwater, and  
19 those experts aren't on this panel. Both of those plans  
20 that Dr. Hollander's referenced were discussed in the  
21 presentation from the hydrogeology panel, but  
22 unfortunately any detailed questions about those plans, we  
23 don't have the experts on this panel to answer those.

24

25 THE CHAIRMAN: Chair. This gets a

1 little difficult because we've artificially pigeonholed  
2 various aspects of this, and there are some questions that  
3 seem to be falling through the cracks as a result of this  
4 arbitrary pigeonholing. So I have some concerns about the  
5 ability to get answers because we've created artificial  
6 delineations. Would you like to recall the previous  
7 panel?

8  
9 MR. DUNCANSON: I think, Mr. Chair, if  
10 Dr. Hollander wants to ask detailed questions about those  
11 plans, we'll have to recall one or more witnesses from the  
12 previous panel, and we could certainly add them to this  
13 panel and it doesn't need to add a whole bunch of extra  
14 process. I think it just depends on the level of detail  
15 that Dr. Hollander requires.

16  
17 THE CHAIRMAN: Hartmut, what would  
18 you -- I think these are good questions and I think we  
19 would like to hear answers, and we are here to hear  
20 answers, and I understand we're kind of rolling back on  
21 process a little bit and I'd be the first person to defend  
22 process. But I think our primary objective is to collect  
23 information so that this set of Commissioners can render a  
24 decision.

25

1 MR. BULLEN: Mr. Chair, it's Brent Bullen,  
2 Sio Silica. Part of Mr. -- Dr. Hollander's question, if  
3 I understand it correctly, when you look at the  
4 abandonment in the sealing of the well and the well casing  
5 that we've used -- so we've drilled the well casing down  
6 into the Winnipeg Formation. We are able to plug the end  
7 of that casing and do an abandonment completely up through  
8 the casing to the surface and do that in accordance with  
9 the guidelines that are given to us. Outside of that  
10 case, that gives you the integrity and ceiling of that  
11 wellbore through, and as it is cemented in place into the  
12 limestone. The secondary question, if I understand it  
13 correctly, is what will we do on the outside of that  
14 casing where you have a void, and there's a discussion of  
15 communication from that void to the Winnipeg Formation  
16 sandstone below. And if that's a communication issue over  
17 water and how water interacts, then I do need the previous  
18 panel members to talk about the geochemistry side, outside  
19 of the abandonment of the wellbore, which we can do.

20

21 MR. HOLLANDER: Yes, I think we --  
22 Hartmut Hollander. Thank you, Mr. Bullen, for explaining  
23 this. I think we have talked about the geochemistry.  
24 That is not required to talk about this again. I would  
25 just like to know, technically, whether the -- yes, you're

1 sealing inside the borehole, inside the steel is possible.  
2 Outside, it will fail. So still, the whole system will  
3 not be able to distinguish or take both parts of this  
4 aquifer part. So there will be a connection that -- what  
5 we also discussed this morning. Are you -- have any ideas  
6 if you could prevent that these two aquifers exchange  
7 their groundwater?

8

9 THE CHAIRMAN: Chair. I'm happy to  
10 have any members of the previous panel take up the  
11 microphones that are in front of them.

12

13 MR. MILLS: Ryan Mills with a comment.  
14 Apologies, I can't look at you directly. Appreciate the  
15 question, and I believe there's a couple of aspects to  
16 that question. The first being the borehole abandonment  
17 component of things. We'll endeavor to establish a  
18 mechanical plug and cementitious with additives including  
19 bentonite grout plugs above that to surface, and so that  
20 would sort of maintain separation between the aquifers  
21 along that borehole axis. At the base of that limestone  
22 formation and the shale formation where we anticipate  
23 there will be some shale failure, it is understood that if  
24 the shale is absent, that it will be difficult to maintain  
25 a perfect hydraulic seal separating aquifers. Based on

1 our previous testing, the -- there is not a perfect seal  
2 now and there is some communication, as you pointed out  
3 yesterday, across that -- what is a leaky aquitard, by all  
4 indications to date.

5 And this morning, with the additional information we  
6 provided as part of our response to the undertaking that  
7 we accepted yesterday, we showed that the gradients will  
8 stabilize after operations. When you consider all of  
9 those things together, in spite of the fact that the shale  
10 may collapse and the fact that it will be difficult to  
11 establish and maintain a cementitious hydraulic plug that  
12 restores that shale barrier, as soon as those hydraulic  
13 heads equilibrate, which we expect to be fairly quickly  
14 after extraction activities cease, there's no driving  
15 force to cause exchange of waters in one direction or the  
16 other in response to hydraulic head gradients. And the --  
17 that is what it -- what the modelling results show. So  
18 that even if that aquitard and the seal is absent, there's  
19 no driving force. So, the physical driving forces that  
20 bring about groundwater flow are near neutral now between  
21 those two aquifers within the project area, and they would  
22 actually diminish to essentially zero in areas where the -  
23 - that shale degradation occurred because there is  
24 equalization of heads between the two aquifers.

25

1 MR. HOLLANDER: Mr. Mills, thank you  
2 very much for the explanation about the well. And that's  
3 the ceiling, is it not? What if it doesn't work? What  
4 will happen? I have one objection to this. In that  
5 moment when you have, as you said, afterward -- after some  
6 time, zero gradient -- that will be correct, you will have  
7 zero gradient. I agree on that. The regional normal flow  
8 pattern will be different. So at this moment, you have a  
9 head difference, which you have simulated with your model.  
10 Afterwards, you will have no head difference because in  
11 the end, all the heads inside the two aquifers will have  
12 more or less -- will -- more or less equal. So you will  
13 change the regional groundwater flow pattern with this and  
14 I have not seen the results of such an analysis. There  
15 might be some changes, I don't know. I have not done the  
16 computation but a steady state analysis of this ---

17

18 THE CHAIRMAN: Chair. Hartmut, I'm  
19 going to caution you. This is not a time for rebuttal.

20

21 MR. HOLLANDER: Okay. I'm sorry for  
22 that. So, yes, thank you very much for explaining what  
23 will happen with the well seal, and I'm fine with this.

24

25 THE CHAIRMAN: Chair. You're done

1 with questions? Thank you. We have 22 minutes left  
2 today, which would permit some time for members of the  
3 public. If there's anyone in the back that wishes to ask  
4 a question, please come forward. I remind you, the  
5 purpose of this session is to ask questions. There will  
6 be opportunities for members to share their feelings in  
7 the two evenings that we've scheduled as well as the  
8 Saturday afternoon, so please come forward. Chair. And I  
9 will remind you, your questions should be confined to  
10 permitting. For this panel, we are -- the exception of  
11 going back was a one off.

12

13 MR. COLE: My name is Ted Cole, C-O-L-E.  
14 And I would request a full week of time to respond to that  
15 last report we just got. I realize that's impossible, and  
16 I appreciate it. But I would like to know from this board  
17 here, or panel, whatever you want to call them, have any  
18 of you, or do any of you, live in the bush? Yes? No?  
19 Hands up? Nothing? Nobody lives in the forest? Okay.  
20 Okay.

21

22 THE CHAIRMAN: Chair. It depends  
23 where you're going with this.

24

25 MR. COLE: Ted Cole again. I've been a

1 bush bunny all my life, which gives me experiences that  
2 probably a lot of people have not had. When you speak of  
3 the nesting season of birds, especially ground birds, I'd  
4 like to bring to your attention, this last spring was a  
5 wet one, and we have wild turkeys. And they didn't  
6 produce any babies this spring. In fact, they were seen  
7 late in the fall with little tiny chicks. So in my  
8 opinion, the nesting birds has -- are in birdhouses, you  
9 will find. They have multiple chances to have babies.  
10 Now, as I mentioned, the turkeys. They are small, but  
11 they can be at any time of the year. Whether that last  
12 batch survives, I don't know. So I question, to this  
13 board, whoever made these decisions, you're getting your  
14 information from professionals, I believe. Would I be  
15 correct?

16

17 MS. GIFFORD: Marlene Gifford. That is  
18 correct.

19

20 MR. COLE: Have any of your professionals  
21 made that comment regarding birds and nesting and having  
22 babies? (inaudible).

23

24 MS. GIFFORD: We do indicate a -- Marlene  
25 Gifford speaking. We do indicate a range for the breeding

1 bird season within the project site. So that is why  
2 clearing of vegetation will be restricted to within that  
3 very sensitive breeding bird season. I understand that  
4 some birds do renest if their nests are destroyed by  
5 weather like you say, or a predator, for example. Many  
6 bird species will renest a little bit later in the season,  
7 but the breeding bird season range that's in the  
8 Environment Act proposal goes right up into late August.  
9 So that is a very conservative time to not have clearing  
10 of vegetation, which will minimize destruction of nests at  
11 the project site.

12

13 MR. COLE: Thank you for that answer.  
14 Ted Cole again. Regarding the birds, so to speak, and  
15 clearing vegetation, does the birds -- or do the birds --  
16 sorry, my English isn't always correct. Do the birds have  
17 babies every year or do they take a break for four years?

18

19 MS. GIFFORD: No. Typically, birds,  
20 depending on the species -- most birds do nest each  
21 season, that's correct.

22

23 MR. COLE: Sorry, go forward.

24

25 MS. GIFFORD: I forgot to say my name.

1 That's Marlene Gifford.

2

3 MR. COLE: Ted Cole. My question then is  
4 -- you know, the great thing about being old is you kind  
5 of get fog moments, but anyhow. If -- and we're talking  
6 large areas of land -- are cleared, and if you use the  
7 example of what happened with the railway track at the  
8 site -- but we can't talk about that, that's a split  
9 thing. If you clear land like that -- you had the babies,  
10 year one. Well, when you've cleared the land, year two,  
11 you're looking at a different story. Now, I don't know  
12 how you're going to get around this problem, because once  
13 you take natural nesting territory and change it  
14 drastically, you're not gonna get those birds back there.  
15 Not until they -- well, let's put it this way. If you cut  
16 down an oak tree -- now, that's one heck of a tree. But  
17 if you cut down an oak tree, you -- and it doesn't have to  
18 be that big. You have just destroyed something that's  
19 been around longer than most of us. Not just one out, but  
20 there are so many critters and birds that rely on that one  
21 oak tree. A small oak tree does not produce acorns. Two,  
22 three, whatever. It's only when they become mature. So,  
23 when you clear the land, that oak tree is no longer there.  
24 And if you look at the growth patterns of an oak tree, we  
25 will be dead and gone before that tree gets anywhere close

1 to what it was when it was cut.

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THE CHAIRMAN: Chair. Can I ask for a question, please? Again, if you wish to share this kind of information, there is another forum to do it, but questions please.

MR. COLE: Ted Cole, I apologize for that. When you say -- and this is a question. When you say you're going to get land access permission that would be in the area of a mine -- what do you call it? Brain fog. A claim? Am I correct?

MR. BULLEN: Yes, that's correct. Brent Bullen, Sio.

MR. COLE: Ted Cole. When you have a claim -- first of all, when do the people find out about this claim?

MR. BULLEN: Brent Bullen, Sio Silica. Within the area that we operate in, we've -- we work ahead of schedule to work with the land owners so they would get notification years ahead. Those of them -- people right now, like, if you look at the public documentation, they

1 can see where our claims reside and whether they are  
2 underneath their lands or not. And we've had discussions  
3 with -- we respect the land owner's wishes. So we've gone  
4 into areas where, you know, they may not wish us to go  
5 into a certain portion of their land and we're not pushing  
6 for that. When you look at the actual land access, it  
7 really comes down to the private owner of the land and we  
8 work with them, and we've been successful to date to line  
9 up the access agreements with their consent, just as if  
10 you had your land, you would want to control your land.  
11 And we've respected that.

12

13 MR. COLE: Thank you for that answer.  
14 Ted Cole. So what you're saying is, I can refuse, then?

15

16 MR. BULLEN: Brent Bullen, Sio Silica.  
17 There are provisions that allow mineral rights to be  
18 extracted and processed, but that's not an avenue we wish  
19 to go down, and that's not one that we've had to pursue or  
20 even look at.

21

22 MR. COLE: Ted Cole. So you say that I  
23 can refuse, but if I do refuse, someone else can make a  
24 decision over my decision, correct? Yes or no?

25

1 MR. BULLEN: Brent Bullen, Sio Silica.

2 There is an arbitration process through the government.

3

4 MR. COLE: Thank you. Ted Cole. Now,  
5 when you so-call get this permission one way or the other,  
6 you are then going to go on the land. My question is, is  
7 there anyone here that's driven big vehicles? And I'm  
8 talking big vehicles, not pickups.

9

10 MR. BULLEN: Brent Bullen. What size are  
11 you talking about? Are you talking about a single tandem  
12 B train?

13

14 MR. COLE: Whatever kind of vehicle  
15 you're going to use. Ted Cole.

16

17 MR. BULLEN: That's a fairly broad  
18 question. Perhaps maybe you can just go to your question.

19

20 MR. COLE: Ted Cole. If you've ever  
21 driven a large vehicle like a drilling rig, you are not  
22 going to get very far on most properties. You will bog  
23 down to your axles, from personal experience. Now, if no  
24 one here has had experience with a vehicle, how do you  
25 propose to get the vehicle from point A to point B where

1       you want to drill?

2

3                   MR. BULLEN: Brent Bullen, Sio Silica. The  
4       actual units that we're using are actually used throughout  
5       Manitoba, around the world, to drill water wells, and they  
6       successfully go on to lands throughout Manitoba and the  
7       region without any access matting or any type of revision  
8       to actually provide additional support on the roadways or  
9       lack of roadways. We've undertaken to look at using  
10      access matting, so it allows us some -- and yes, we  
11      brought in large multi axial loads onto conventional land  
12      with the use of matting.

13

14                  MR. COLE: Thank you for that answer, and  
15      I did make a mistake when I asked it because I knew there  
16      was going to be a lot of time going on that one. My  
17      apologies again. Ted Cole. When you get a vehicle on the  
18      property -- I've been dragged with a huge -- CATs and  
19      whatever. So yes, you will get through. I don't care how  
20      bad it is, you will get through. So much for the vehicle,  
21      though. Now, when you go on a property, you say you're  
22      going to avoid structures. I don't want to ask you about  
23      what you would describe a structure because we'll  
24      definitely be out of time. Do you have more than one road  
25      on a property? Yes or no?

1

2

MR. BULLEN: No.

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THE CHAIRMAN: Chair. This will be your last question. Ted, you are basically out of time. In fact, we as a day are out of time.

MR. COLE: Thank you very much. I appreciate the time you've given me and I -- like I say, I do appreciate getting a chance to say something, and I am still scared and more so after what I've just seen here.

THE CHAIRMAN: Chair, thank you very much. So, I believe this draws us to the close of day four. We will reconvene day five on Monday, March the 6th, starting at 1:30 p.m. So, we will go have an afternoon session followed by our first evening session to hear from the public. So, thank you all for what I think has been an extremely productive week. Thank you to the experts that gave their testimony and to those that asked questions, and with that, we are adjourned. See you Monday.

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