



MACKENZIE VALLEY ENVIRONMENTAL

IMPACT AND REVIEW BOARD

JAY PROJECT EA1314-01

TECHNICAL SESSIONS

Facilitator

Bill Klassen

HELD AT:

Yellowknife, NT

Tree of Peace

April 22, 2015

Day 3 of 5

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2 Jamie VanGulck )Arktis Solutions

3 Al Woodbury (bv phone) )University of

4 )Manitoba

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6 Sarah-Lacey McMillian )Environment Canada

7 Dave Fox (np) )

8 Meagan Tobin )

9 J.F. Dufour (np) )

10 Bradley Summerfield )

11 Reg Etackam (bv phone) )

12 Anne Wilson (bv phone) )

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14 Christopher Aquire (bv phone) )Transport Canada

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20	Arthur Beck		) Council
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23			) Alliance
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1 APPEARANCES (Con't)

2 Grace Mackenzie (np) )Tlicho Government

3 Henry Zoe )

4

5 Tannis Bolt )Kitikmeot Inuit Asc.

6

7 Tom Hoefer (np) )Chamber of Mines

8

9 Gord MacDonald )Diavik

10

11 Sarah Robertson )CanNor-NPMO

12 Marie Adams (np) )

13

14 Noeline Villebrun )Members of Public

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1		LIST OF HOMEWORK
2	Number	Description
3	15	DDEC is to review the Diavik
4		pre-mitigation (prior to 2008) wet sump
5		ammonia and nitrate water quality
6		results and consider their incorporation
7		into the water quality model for the
8		Miserv pit by the end of the Technical
9		Sessions
10	16	DDEC is to confirm whether the inputs
11		for the post-closure model were based on
12		period 13 or 14 end of period results by
13		the end of the Technical Sessions
14	17	DDEC is to investigate what thresholds
15		for surface water level and discharge
16		rates for the narrows would trigger
17		mitigation measures (e.g. modified
18		back-flooding rates) during the Jay pit
19		back-flooding period
20	18	DDEC is to examine whether the results
21		of the ARD analysis would differ if the
22		carbonate neutralization potential
23		rather than bulk neutralization
24		potential were used
25		

1	LIST OF HOMEWORK (Con't)	
2	Number	Description
3	19	DDEC is to clarify values regarding
4		runoff coefficients in Table B-3 from
5		Appendix 3A (DAR)
6	20	DDEC is to provide clarification on the
7		discrepancy between the duration of
8		pumped outflows and increases/decreases
9		in volume in the Jay and Misery pits
10		(Figures 6-3, 6-6, DAR Appendix 3-A)
11	21	DDEC is to clarify whether chlorophyll a
12		model predictions reflect actual
13		chlorophyll a values, or some other
14		metric of phytoplankton productivity in
15		the Appendix 8-F model
16	22	DDEC is to clarify if the W-2 model
17		accounts for salt exclusion (Appendix
18		8-G)
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21		
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1	LIST OF UNDERTAKINGS	
2	Number	Description
3	4	DDEC is to include Jav underground as an
4		RFD case as it may contribute to
5		cumulative effects on caribou (further
6		to Homework 13) by May 8th
7	5	DDEC is to complete a draft Traffic
8		Management Plan for the Jav road by May
9		8th, and host a short review period and
10		subsequent workshop
11	6	DDEC will provide a summary of 2015
12		hydrogeology results and qualitatively
13		describe how these updates align with
14		previous predictions to the Review Board
15		for inclusion on the public registry by
16		August 1st, 2015
17	7	DDEC is to validate the hydrologic model
18		for the Desteffany Lake outlet for the
19		years possible (in order to increase the
20		certainty of accuracy of the model) by
21		May 8th
22		
23		
24		
25		

1	LIST OF UNDERTAKINGS (Con't)	
2	Number	Description
3	8	DDEC is to provide a comparison of the
4		volumes of Lac de Gras and Snap Lake
5		(including residency time/turnover of
6		water in Lac De Gras) and the total
7		volumes of effluent that will be
8		discharged into these lakes by May 8th
9	9	DDEC will examine publically available
10		information on pumping test data from
11		Dewey's Fault, specifically the type of
12		testing that was conducted in the Diavik
13		case and identify the potential for
14		conducting such testing at Ekati and its
15		relevance for the Jay case
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1 --- Upon commencing at 9:00 a.m.

2

3 THE FACILITATOR: Good morning again.

4 My name is Bill Klassen. I've been asked to facilitate  
5 these technical sessions. And today's topic, as I'm  
6 sure we're all aware, is water quantity and quality and  
7 hydrology. And then in the afternoon we'll be looking  
8 at overall water management approach, hydrology, and  
9 water quality.

10 As we have done the -- the last two (2)  
11 days, first of all I'd like to acknowledge the fact  
12 that we are meeting within the traditional territory of  
13 the -- the Yellowknives Dene. And then I would like to  
14 do a round of introductions. There are different  
15 people in the room today than there were the last few  
16 days.

17 So I think it's helpful to know who is  
18 here, and then when they -- they speak you've got some  
19 context for that. So before we do that, however,  
20 there's the -- the usual matters. There are two (2)  
21 exits from this room in the event of an emergency,  
22 which we trust won't occur. The washrooms are over on  
23 the far corner. There's water and coffee and other  
24 refreshments on the -- the side table.

25 I would ask everyone that has a cell

1 phone to put it on mute, please, so that we don't have  
2 the distraction of -- some of those calls that people  
3 have are really interesting. Ground squirrels. They  
4 get my attention.

5                   And the other thing, the staff has asked  
6 me to remind everyone to sign in, please, so that we  
7 have a record of who is in attendance. And then when  
8 you do speak, if you would identify yourself so that --  
9 for the transcriber's benefit. These technical  
10 sessions are being transcribed, so we want to have  
11 again accuracy as to who is saying what.

12                   We have had media present the last  
13 couple of days, and so I would ask that if media feels  
14 the need to interview anyone, that they do it outside  
15 of -- outside of this room. And I think I'll stop  
16 there. I have a few more remarks, but let's do  
17 introductions first.

18                   I've given you my name, and we'll start  
19 with Sachi.

20                   MS. SACHI DE SOUZA:    Sachi De Souza,  
21 with the Board.

22                   DR. NEIL HUTCHINSON:   Neil Hutchinson,  
23 technical consultant to the Board.

24                   MR. CHUCK HUBERT:    Chuck Hubert, with  
25 the Board.

1 MR. MARK CLIFFE-PHILLIPS: Mark Cliffe-  
2 Phillips, with the Board.

3 DR. KATHY RACHER: Kathy Racher,  
4 technical consultant for the Board.

5 MR. JOHN DONIHEE: John Donihee. I'm  
6 Board counsel.

7 MS. KATE MANSFIELD: Kate Mansfield,  
8 with the Review Board.

9 MR. CHRIS ROSE: Chris Rose, with the  
10 Review Board.

11 MR. EMORY PAQUIN: Emory Paquin,  
12 Independent Environmental Monitoring Agency.

13 MR. TIM BYERS: Tim Byers, Monitoring  
14 Agency.

15 MR. TEE LIM: Tee Lim, with the Agency.

16 MR. NEIL VAN DER GUGTEN: Neil van der  
17 Gugten, AMEC for GNWT.

18 DR. JAMIE VANGULCK: Jamie VanGulck,  
19 with Arktis Solutions for the GNWT.

20 MR. RICK WALBOURNE: Rick Walbourne,  
21 GNWT-ENR, Water Resources Division.

22 THE FACILITATOR: I think we'll --  
23 we've got a mic being handed around, so we'll take  
24 everyone else in turn.

25 MR. SIMON TOOGOOD: Simon Toogood, with

1 the Review Board.

2 MS. MEGAN TOBIN: Megan Tobin,  
3 Environment Canada.

4 MS. SARAH-LACEY MCMILLAN: Sarah-Lacey  
5 McMillan, with Environment Canada.

6 MR. SHIN SHIGA: Shin Shiga, with North  
7 Slave Metis Alliance.

8 MR. PETER UNGER: Peter Unger, Lutsel  
9 K'e Dene First Nation.

10 MR. MARC D'ENTREMONT: Marc  
11 d'Entremont, technical advisor to the Deninu K'ue First  
12 Nation.

MR. TONY BUGGINS: Good morning. My  
13 name is Tony Buggins. I will be providing interpreting  
14 services when required.

15 MR. TOM UNKA: Tom Unka, NWT Metis  
16 Nation.

17 MR. ARTHUR BECK: Arthur Beck, Fort  
18 Resolution Metis Council President.

19 MS. LAURA WORSLEY-BROWN: Laura  
20 Worsley-Brown, Dominion Diamond.

21 MR. RASHAAD BHAMJEE: Rashaad Bhamjee,  
22 GNWT-ITI.

23 MS. TANNIS BOLT: Tannis Bolt,  
24 Kitikmeot Inuit Association.

25 MS. ELISSA BERRILL: Elissa Berrill,



1 the Wek'eezhii Land and Water Board.

2 MR. MARTY SANDERSON: Martv Sanderson,  
3 GNWT Lands Inspector.

4 MR. SCOTT STEWART: Scott Stewart, GNWT  
5 Lands.

6 MS. SARAH ROBERTSON: Sarah Robertson,  
7 Northern Projects Management Office.

8 MS. KATE WITHERLY: Kate Witherly, with  
9 Environment and Natural Resources-GNWT.

10 MS. MELISSA PINK: Melissa Pink, GNWT  
11 Lands.

12 MR. PAUL MERCREDI: Paul Mercredi, GNWT  
13 Lands.

14 MR. CAM STEVENS: Cam Stevens, Golder  
15 Associates.

16 MR. ERIC DENHOLM: Eric Denholm, E.  
17 Denholm Consulting.

18 MR. BILL PAIN: Bill Pain, with Waters-  
19 ENR.

20 MR. PAUL GREEN: Paul Green, with  
21 Waters-ENR.

22 MR. NATHAN SCHMIDT: Nathan Schmidt,  
23 with Golder Associates for Dominion.

24 MS. FIONA ESFORD: Fiona Esford, Golder  
25 Associates.

1 MS. KRISTINE MASON: Kristine Mason,  
2 Golder Associates.  
3 MR. JOHN FAITHFUL: John Faithful,  
4 Golder Associates.  
5 MR. MICHAEL HERRELL: Mike Herrell,  
6 with Golder Associates.  
7 MR. PAUL BEDDOES: Paul Beddoes, with  
8 Golder Associates.  
9 MS. AMY LANGHORNE: Amy Langhorne,  
10 Golder Associates.  
11 MR. STEVEN STRAWSON: Steve Strawson,  
12 with Golder Associates.  
13 MR. DON CHORLEY: Don Chorley, with  
14 Golder Associates. I'll be doing the hydrogeology  
15 assessment for the Jay project.  
16 MS. CHRISTINE BIEBER: Christine  
17 Bieber, with Golder Associates.  
18 MR. RICHARD BARGERY: Richard Bargery,  
19 Dominion Diamond.  
20 MR. ELLIOT HOLLAND: Elliot Holland,  
21 Dominion Diamond.  
22 MS. CLAUDINE LEE: Claudine Lee,  
23 Dominion Diamond.  
24 MR. PATRICK DUFFY: Patrick Duffy,  
25 legal counsel for Dominion Diamond.

1 MS. STACEY MENZIES: Stacey Menzies,  
2 with the Review Board. Did I miss anybody? No? Okay.  
3 Thanks.

4 THE FACILITATOR: Thank you, Stacey.  
5 And thank you, everyone. The agenda is on the screen  
6 behind me. And so we'll be having a presentation from  
7 Dominion Diamonds. And then following that  
8 presentation, we'll be looking for questions or  
9 comments from the parties present. And after -- those  
10 who are not part of the Board staff or providing advice  
11 to the Board have had their opportunity to ask  
12 questions or make observations, then I will ask Board  
13 staff to ask questions as well.

14 Sachi will be making sure that we cover  
15 all of the topics that -- that we need to. Before we  
16 get to the presentation though, in the last couple of  
17 days there have been homework assignments. Dominion  
18 Diamonds has undertaken to provide additional  
19 information on some topics that wasn't available during  
20 the day. And so, Richard, I would turn it over to you  
21 to provide comment on some of the items.

22 MR. RICHARD BARGERY: Thanks, Bill.  
23 Richard Bargery, Dominion Diamond. We -- we've  
24 completed a number of -- of the assignments and -- and  
25 I think one (1) of the commitments. So I'm going to

1 ask Claudine Lee to read into the record the -- the  
2 responses to -- I -- I think three (3) of the homework  
3 assignments and one (1) of the commitments.

4 THE FACILITATOR: Yes, could it --  
5 could we hold that just for a moment? I -- I apologize  
6 to the people who are on the -- on the telephone.  
7 There are a number of individuals who are joining us by  
8 teleconference. They weren't able to be here.

9 So would those of you who are on the  
10 telephone please identify yourselves and give us your  
11 association?

12

13 (BRIEF PAUSE)

14

15 THE FACILITATOR: I always feel as if  
16 I'm speaking into a void here and I'm waiting for a  
17 response from above. Okay. I -- I thought I heard the  
18 telephone, but we'll listen for the -- the sound as  
19 they join us and I'll ask them to introduce themselves  
20 then. Richard, please go ahead with...

21 MS. CLAUDINE LEE: Hi. Claudine Lee,  
22 Dominion Diamond. I'm going to read out a couple of  
23 the homework assignments and one (1) of the  
24 commitments.

25 So in regards to homework assignment

1 number 11, setbacks and blasting. The safe setbacks  
2 from blasting vary based on numerous factors including  
3 size and type of blast, the depth of blast within the  
4 pit, type of blast, the depth of blast within the pit,  
5 type of explosive being used, and material being used.

6                   The safe setback distance for a blast in  
7 operational use at the Ekati mine is generally between  
8 500 and 1,000 metres from the pit edge. This is the  
9 approximate range of area size monitored to confirm  
10 animals are not present. And if they are, blasts are  
11 delayed until they move away.

12                   Moving on to homework assignment number  
13 13. Dominion Diamond is of the view that the DAR and  
14 supplemental work on Sable and A21 contains a  
15 comprehensive analysis of all reasonably foreseeable  
16 developments. However, recognizing the importance of  
17 the caribou issue, Dominion Diamond agrees to assess a  
18 Jav underground scenario in addition to the RFD case  
19 for caribou.

20                   The analysis would be submitted by the  
21 end of the undertaking period, May 8th, 2015. As  
22 stated yesterday, a Jav underground scenario cannot be  
23 included in the RFD case. There is currently no  
24 defined mineral resource. Significant exploration  
25 would be required to adequately assess the feasibility

1 of underground mining.

2 Additional information to support  
3 engineering design is also needed. For these reasons,  
4 any assessment of a Jay underground scenario for water-  
5 related valued components would require so many  
6 assumptions that the quality and utility of such work  
7 would not be helpful or meaningful to the assessment of  
8 the Jay project.

9 Homework assignment number 14. Dominion  
10 Diamond understood the request provided in KIA-7 and  
11 KIA-24 to be about monitored responses by caribou  
12 relative to traffic. The responses provided for these  
13 requests were focussed on identifying that the caribou  
14 focal scan monitoring program was better suited to  
15 provide the requested information.

16 The focal scan monitoring program is a  
17 non-camera based -- is not camera based, but instead,  
18 quantifies the duration of different behaviours  
19 observed by Ekati mine wildlife technicians. Results  
20 of both programs were summarized, including some of the  
21 practical limitations of a camera study to provide this  
22 information.

23 As well, the response for KIA-7,  
24 acknowledged that the camera study may not capture  
25 deflection of caribou before they reach the roads.

1 Dominion does not believe that the responses provided  
2 for KIA-7 and KIA-24 include contradicting statements  
3 related to the results of these two (2) different  
4 monitoring programs.

5                   And then the last one on commitment  
6 number 3, process for caribou and roads mitigation  
7 plan. Dominion Diamond has heard the concerns  
8 expressed over the past two (2) days with regards to  
9 monitoring, mitigation measures, thresholds, and the  
10 use of a decision tree to manage the risks roads and  
11 traffic pose to caribou.

12                   In recognition of the importance of this  
13 issue, Dominion Diamond intends to review and consider  
14 the comments heard during the technical session and  
15 will incorporate appropriate measures related to the  
16 Jay project into the draft Wildlife and Roads  
17 Mitigation Plan, as we've been referring to in the last  
18 couple of days, the Traffic Management Plan, where  
19 appropriate.

20                   This document will be distributed to  
21 parties by the end of the undertaking period, May 8th,  
22 2015. Following a short review period, Dominion  
23 Diamond will host a Jay roads and traffic monitoring  
24 and mitigation workshop to receive input that can be  
25 considered for inclusion in the final Wildlife and

1 Roads Mitigation Plan for the Jay project.

2 THE FACILITATOR: Thank you, Claudine.

3 I don't want to take too much time on these responses,  
4 but are there any questions of clarification on any of  
5 these? Chuck...?

6 MR. CHUCK HUBERT: Chuck Hubert, with  
7 the Review Board. Thanks for that homework response,  
8 in particular, to number 13. So that in fact moves  
9 from a homework item to an undertaking. It -- it --  
10 would that be your understanding?

11 MR. RICHARD BARGER: Richard Barger,  
12 Dominion Diamond, I think that's appropriate, yes.

13 MR. CHUCK HUBERT: Chuck Hubert, with  
14 the Board. Thanks.

15 THE FACILITATOR: Not seeing any other  
16 indication of questions of clarification, I'd like to  
17 move on then to today's agenda. And we'll begin with -  
18 - with the presentation.

19

20 (BRIEF PAUSE)

21

22 THE FACILITATOR: And I'll check again  
23 to -- out there in radio land, is there anyone on the  
24 teleconference that would introduce themselves, please?

25 MR. CHRISTOPHER AGUIRE (BY PHONE): Hi.



1 This is Christopher Aquire, with Transport Canada.

2 Sorry about being late.

3 THE FACILITATOR: Okay. Thank you.

4 MR. AL WOODBURY (BY PHONE): This is Al  
5 Woodbury, University of Manitoba.

6 THE FACILITATOR: Excellent. Is there  
7 anyone else?

8 MR. TONY PEARSE (BY PHONE): Yeah.  
9 Tony Pearse, from the Environmental Monitoring Agency.

10 THE FACILITATOR: Thank you.

11 MR. REJ EJECKAM (BY PHONE): I'm Rej  
12 Eieckam, with Environment Canada from Winnipeg.

13 THE FACILITATOR: Okay.

14 MR. IGNACIO DUQUE (BY PHONE): Ignacio  
15 Duque, from Transport Canada in Ottawa.

16 THE FACILITATOR: Thank you. Anyone  
17 else?

18

19 (BRIEF PAUSE)

20

21 THE FACILITATOR: Okay. Thank you very  
22 much. We'll now proceed with the presentation. I'm  
23 not sure -- I'm looking at Board staff here. Do those  
24 of you on the telephone have access to this  
25 presentation by way of WebEx?

1 MR. REJ EJECKAM (BY PHONE): Yes. Rej  
2 Eieckam, Winnipeg, okay.

3 MR. TONY PEARSE (BY PHONE): Yeah. I'm  
4 seeing Diamond Dominion -- or Dominion Diamond  
5 Corporation.

6 MR. CHRISTOPHER AGUIRE: Yeah. We have  
7 -- I have access to it on WebEx.

8 THE FACILITATOR: Okay. Thank you.  
9 We'll proceed, then, as soon as we get the screen  
10 sorted out here.

11

12 (BRIEF PAUSE)

13

14 MS. SACHI DE SOUZA: Just to go through  
15 the agenda in a little bit more detail for right now,  
16 we're going to start with the hydrogeology  
17 presentation. So -- and moving from that into a  
18 question period that primarily relates to questions on  
19 the hydrogeology model, questions about the enhanced  
20 permeability zone, the water quality that's predicted,  
21 and the model inputs.

22 From there, we're going to move into  
23 hydrology. There's a chance that might be able to  
24 happen in the morning, I think, and so that will be the  
25 hydrology model.

1                   In the afternoon, we anticipate being  
2 able to move into the overall site water management and  
3 closure predictions. So for site water management,  
4 we'll go through the waste rock storage area  
5 predictions. So we've deferred this conversation for a  
6 couple of days.

7                   So we'll get through that, and then  
8 questions related to climate, and then also questions  
9 related to the capacity of the water management system  
10 and contingencies and safety factors, and then the  
11 questions related to -- or the topic of discharge  
12 timing and the discharge quality into the receiving  
13 environment.

14                  And finally, we'll close off the day  
15 talking about closure and post-closure. So those will  
16 relate to the meromixis predictions and the effect on  
17 the downstream environment after operations.

18

19 PRESENTATION BY DOMINION DIAMOND - HYDROGEOLOGY:

20                  MR. DON CHORLEY: Thank you. This is  
21 Don Chorley, with Golder. I will be speaking about  
22 the hydrogeology and our assessment.

23                  Okay. In this introduction, I'm just  
24 going to state some things to keep in mind through the  
25 presentation that are important. And it's really

1 responding to the IRs in a general sense, just  
2 providing you some background.

3                   The most important thing is that we've  
4 used the -- conservative assumptions were built into  
5 the assessment, so we have a high level of confidence  
6 that the effects to the environment have not been  
7 underestimated. With these conservative assumptions,  
8 we see predictions of local changes in groundwater  
9 quantity and quality, and we see changes, small  
10 changes, in lake volumes in the -- outside of the  
11 immediate area of the project. Our projected occurred  
12 due to groundwater flow to the mine. All of these  
13 effects go back to near zero at -- during closure and  
14 post-closure.

15                   Okay. How did we -- how did we look at  
16 the baseline conditions? Several methods. Site --  
17 site data was hydraulic testing, and the water quality  
18 was determined with the Westbay monitoring well. The  
19 hydraulic testing has -- has been carried on this year  
20 also. The -- this -- this just shows the work that was  
21 -- the bore holes that were done in -- in 2014, but  
22 there's been additional holes done in 2015, basically  
23 twice as many of the deep ones that are around the  
24 pipe. And then we've also used Ekati and Diavik data.

25                   What did we -- what were the results of

1 this -- these investigations? First of all, I wanted  
2 to explain what the rig -- rigorous procedure was to  
3 get representative samples out of the Westbay  
4 instrument.

5                   In the arctic, because of permafrost,  
6 what you have to do is you have to drill either with  
7 heated water so that the hole doesn't freeze, or you  
8 have to drill with brine. And what this can do is it -  
9 - when you're sampling it, you have to be sure that  
10 that drilling fluid is out of the sample so that you're  
11 not getting -- in the case of heated lake water, you're  
12 not getting a diluted sample. In the case of brine,  
13 you're not getting a sample that is -- is basically  
14 contaminated by higher concentration TDS than would be  
15 in the -- in the sample.

16                   Represented, we mean that's what is  
17 actually in the formation at that elevation. What we  
18 did at -- at the Jay project is that we tagged the  
19 drilling fluid with a fluorescein dye, and at a  
20 concentration of about 600 parts per billion. And what  
21 this allowed us to do is that when we were developing  
22 an interval, we developed the interval until that dye  
23 was less than 10 percent of the drilling fluid.

24                   So that would mean that that would be 90  
25 -- more than 90 percent of that water is actually

1 formation water, represented water, and the other less  
2 than 10 percent is actually drilling fluid. And then  
3 we could correct for that drilling fluid, because we  
4 sampled the drill -- drilling fluid also, so we could  
5 correct for that and take -- take the effects of that  
6 out of the -- out of the analysis.

7                   This was not -- this was very intensive  
8 -- work intensive. One interval, it took up to twenty-  
9 five (25) days working twenty-four (24) hours a day on  
10 developing the interval, so you can imagine that. But  
11 these are accurate and representative samples.

12                   We show on here where the samples lined  
13 up. There's the three (3) samples. Interval 5, 7, and  
14 9. And the twenty (20) -- we did the first sampling  
15 was in spring of 2014. That's what's reported in the  
16 DAR. But we also did another round in 2014, and  
17 basically they line on top of each other, so it --  
18 that's -- confirms and validates that. We're also  
19 doing a sampling round as -- as is I speak, right now  
20 in 2015.

21                   Okay. The -- this slide is -- just  
22 shows the hydraulic conductivity data that we got from  
23 the -- from the testing. All the diamond shapes are --  
24 are the data from the site. But we also show on this  
25 slide the profile that we use in the bedrock. This is

1 outside the enhanced permeability, and so this is the  
2 zone for the conservative case in the DAR, and this is  
3 the profile for the -- for the reasonable expected  
4 case, or the reference case that we use in the -- in  
5 the DAR.

6                   You should note that basically, we're  
7 assuming that the concentrations of the bedrock outside  
8 the enhanced permeability are -- are the same the  
9 entire depth of the model domain. That's 1.5  
10 kilometres. This is a conservative assumption -- assumption  
11 in itself, because what you see is that really, other -  
12 - it's -- you see this big reduction in -- in hydraulic  
13 conductivity with depth. It's just what you expect,  
14 because of the weight of the rock on -- on that.

15                   What we've circled here is what we  
16 thought -- these were outliers, and we thought this  
17 might be representative of a enhanced permeability  
18 zone. We've since find in 2015 -- because we looked at  
19 these in a little bit more detail in 2015. These were  
20 -- two (2) of these are -- three (3) of these are from  
21 the -- from the Westbay instrument. We found that that  
22 is not actually a -- a representative enhanced  
23 permeability zone, because it doesn't intersect the  
24 pipe, and it's of limited extent.

25                   Okav. In our assessment, what -- what -

1 - the biggest source of conservative in our assessment  
2 is this enhanced permeability zone. I -- I want to  
3 emphasize, though, this is an assumed zone. We have  
4 not seen anything in the drilling in 2014 and 2015 that  
5 would be as transmissive as -- as this zone.

6                   So we're -- we're just -- basically what  
7 we've done here is we've taken the parameters from the  
8 most transmissive zone in -- in the area. And that's  
9 Duev's Fault at -- at Diavik. And we've used that --  
10 we've assumed that that is -- is the enhanced  
11 permeability zone at the -- at the Jav pit.

12                   There's other -- there's other  
13 assumptions that are conservative too, is that it's  
14 continuous over the whole model domain. That's 20  
15 kilometres. Conceptually you wouldn't expect this to  
16 actually be the -- the case that it would be  
17 hydraulically connected over that distance because the  
18 -- the greatest disturbance is going to be close to the  
19 -- the pipe because that's where it moves up through  
20 the -- through the rock when it's -- the genesis of the  
21 -- of the kimberlite pipe.

22                   So that's -- that -- that can't be  
23 underestimated. Because when we looked in sensitivity  
24 at a shorter -- shorter zone, 2 kilometres, it was --  
25 it reduced the groundwater inflow by 24 -- about 24



1 percent and the groundwater quality by 60 -- about 65  
2 percent.

3                   This is just showing the two (2)  
4 scenarios we did. We did a reasonable estimate case.  
5 Now, the reasonable estimate case also is -- is a  
6 little bit conservative because it does have an EPZ and  
7 -- and it is Duev's Fault, but is just 60 percent of  
8 Duev's Fault, so 60 metres wide.

9                   And then we have the EA conservative  
10 case. And this just shows how the parameters were --  
11 were developed. If we -- we used conservative  
12 assumptions for parameter values when -- when they --  
13 when we were uncertain so that was in the literature in  
14 analog slice -- sites. We neg -- neglected density  
15 effects. Density effects is -- you've got more dense  
16 water. That -- that really deep saline water is -- is  
17 denser than the fresh water. So by buoyancy and  
18 gravity it wants to stay down there. But we didn't put  
19 those effects in there. So it was -- it was  
20 underestimating the -- underestimating the -- the -- it  
21 is overestim -- our model is overestimating the amount  
22 of up-welling when we don't consider density effects.

23                   Okay. In the reasonable estimate it's  
24 60 metres wide and the hydraulic conductivity of the  
25 bedrock is based on the hydraulic testing. So it's a

1 reasonably conservative prediction. The difference in  
2 the EA conservative scenario is that the EPZ is a  
3 hundred metres wide. That's equivalent to Duev's  
4 Fault. And a hydraulic conductivity of ba -- of -- of  
5 the bedrock is -- outside of the Duev's Fault is three  
6 (3) times greater than -- than from the testing. So it  
7 provides a high level of confidence that effects have  
8 not been underestimated.

9                   When you bring all the -- the  
10 groundwater inflow quality and quantity together with  
11 surface water and perc -- and precipitation, these are  
12 all the inputs to the water quality model. This is --  
13 I guess this is really the -- the results of all the  
14 modelling and it's all tied together with -- I -- I  
15 wanted to show this because it shows the -- the  
16 different cases.

17                   This is for the discharge TDA -- TDS  
18 concentrations in Miserv pit discharge. So this would  
19 be discharge to Lac du Sauvage. No, this is to Lac de  
20 Gras, right? Lac -- Lac de Gras. And you can see that  
21 we have the reasonable estimate is -- is here, is the  
22 red one (1). The blue one (1) -- the green -- this  
23 green -- green colour here, that's the EA conservative  
24 case. This is the reasonable estimate with the TDS  
25 profile increased by two (2) times.

1                   And then we also did a case where --  
2   where there was a question in an IR about is -- is the  
3   -- is assuming that the weathered rock or the rock  
4   that's been affected by isostatic rebound is -- is more  
5   permeable on the high -- high end permeable range of  
6   its values, is that conservative? I -- I think what  
7   they were wondering was that if you reduced the -- the  
8   hydraulic conductivity that we assumed in the weathered  
9   zone, would that result in more up-welling because you  
10  wouldn't have this more fresh water coming in.

11                   What we found was, no, it doesn't. It  
12  actually -- it is actually the least conservative case,  
13  which is this -- this blue one here. So you can see  
14  with this that what we've done with the EA, we -- is we  
15  have a high level of confidence that -- that the  
16  effects have not been underestimated.

17                   But one (1) important thing that we've  
18  found was that the -- it's because of how the water is  
19  managed, and you'll find that out later today. Higher  
20  groundwater quantity is a dominant factor. If you've  
21  got twice as much quantity, twice as much flow, it has  
22  a bigger effect than if you have twice as much of the  
23  TDS profile, so.

24                   This is -- this is a slide that -- this  
25  shows some of the -- the results from our predictions

1 at post-closure for the -- the Miserv pit. The Mi --  
2 Miserv pit right now is developed in an open talik.  
3 That's -- that's an unfrozen ground that connects the -  
4 - the surface to the deep groundwater flow regime. So  
5 it already is -- it has -- it is experiencing some  
6 inflows, but the results say that it's safe to indicate  
7 that most of that inflow is coming from the active  
8 layer. It's a very small amount.

9 But what we've assumed in here to be  
10 conservatively, we said, okay, that -- that will --  
11 we're just assuming that all that water is coming from  
12 an enhanced permeability zone at Miserv -- Miserv pit.  
13 So what -- what we get from that, we estimate the  
14 hydraulic conductivity of that zone and we say, okay,  
15 here is -- it's directly connected -- it's directly  
16 connect to Lac de Gras and this is the -- this is the  
17 results of that.

18 But what we -- what we see is -- also I  
19 should mention that as -- as the -- during closure,  
20 because of the -- the water that's in the Miserv pit,  
21 it'll actually expand that talik zone, and that's what  
22 we've accounted for during the thermal modelling. So  
23 it actually reduces the -- the depth of permafrost here  
24 and it actually widens this -- this zone here. But  
25 that's been accounted for in this -- this model.

1                   So this is a 2D section along the --  
2 along the enhanced permeability zone. And these are  
3 the results from that -- that scenario. There --  
4 there's two (2) scenarios. One (1) is that we increase  
5 the hydraulic conductivity, but we narrow the enhanced  
6 permeability zone. So we come up with the same  
7 transmissivity. And then the other is that we widen it  
8 then lower the hydraulic conductivity.

9                   And these are the two (2) scenarios, but  
10 both of them sort of stabilize that. About 55 metres  
11 cubed per day would be the discharge in the out -- from  
12 the -- through the groundwater up to Lac de Gras. And  
13 the concentrations would be in here. I can't really  
14 read that.

15                   But what this -- this model is -- these  
16 results are input to the hydrodynamic model. So they  
17 will -- you'll get a presentation on that, I think.

18                   Okay. This is a summary on the conclus  
19 -- conclusions that we had. I -- I've shown you that  
20 the conservative assumptions were used in the -- the  
21 model in our analysis. The project results in local  
22 changes in groundwater quantity and quality, but these  
23 are -- will go back to near zero over time at -- at  
24 post-closure.

25                   Local change to groundwater quality have

1 no significant adverse effect to surface water quality.  
2 After mining, groundwater levels, as -- as I said, and  
3 quantity will be near current or baseline conditions  
4 with negligible changes. There'll be negligible  
5 changes in the lake water volumes and at -- after  
6 mining those will return to -- to near-zero effects.

7 Predicted groundwater inflow quantity  
8 and quality will be validated during operational  
9 monitoring. And those monitoring programs will be  
10 developed in the permitting phase. That's the end of  
11 my presentation.

12

13 (BRIEF PAUSE)

14

15 THE FACILITATOR: Thank you. We'll now  
16 proceed to the agenda. It's, for the record, Bill  
17 Klassen, the facilitator. And we'll be looking for  
18 questions or comments on the topics that Sachi outlined  
19 for us just before the -- just before the presentation.

20 And so we'll be asking for parties  
21 present to -- to ask their questions. And then,  
22 following that, then we'll ask the Board staff or Board  
23 advisors to ask their questions.

24 So we have on the screen behind me here,  
25 the first topic then is the Jay pit. And we'll begin

1 with the enhanced permeability zone. And I'll ask for  
2 questions on that -- that particular topic. We have a  
3 lot of area to cover today, so we'll need to try and  
4 keep it focussed. Thank you.

5 Are there questions on Jav pit  
6 permeability zone? Yes. Please, when you speak,  
7 identify yourself for the record. Thank you.

8

9 QUESTION PERIOD:

10 DR. JAMIE VANGULCK: Thank you. It's  
11 Jamie VanGulck for the GNWT. I have a few questions  
12 about the enhanced permeability zone. The first one  
13 relates to Information Request 6, and this was -- this  
14 question was initially posed to further understand the  
15 -- the inputs to the hydrogeological model.

16 And the developer's response referenced  
17 the Diavik pit, in particular pit A154, and some of the  
18 model assumptions, the model inputs. So I have a few  
19 questions about that -- that case study and how that  
20 was applied for the Jav pit.

21 The first question is for the Diavik  
22 A154 pit hydrogeological model. The model was revised  
23 in 2004, is my understanding, and it incorporated some  
24 of the investigation data completed up till that time,  
25 as well as monitoring data.

1                   What was the reason for updating the  
2 hydrogeological model for the Diavik case?

3                   MR. DON CHORLEY:    Okav.   That was  
4 updated -- Don Chorley, with Golder.

5                   THE FACILITATOR:   Sorr.   Just indicate  
6 who you are when you speak, please.   Thank you.

7                   MR. DON CHORLEY:    Gotcha.   Okav.   Yeah,  
8 that was updated because at that time what we learned  
9 from the Diavik is that -- that there is these enhanced  
10 permeability zones.   And that's why it was updated  
11 because it was -- the inflows were underestimated  
12 because of the presence of that enhanced permeability  
13 zone.

14                   So we learned from that -- that project,  
15 and that's what we've applied since then.   And that's  
16 what everybody is applying to -- to kimberlite pipes at  
17 this time.   Does that answer your question?

18                   DR. JAMIE VANGULCK:   Thank you.   Jamie  
19 VanGulck.   Partly.   Was this a reassessment that was  
20 done in response to the -- the measured data, or was  
21 this reassessment that was done as a requirement of a  
22 permit or a licence condition?

23                   MR. DON CHORLEY:    No, it was done based  
24 on the -- on the data.   There was two (2) things --  
25 data.   You could see -- the reason why it was called



1 Duev's Fault is that a backhoe operator named Duev was  
2 excavating, and they -- they knew -- they could see the  
3 -- the greater flow there. And it's always been Duev's  
4 Fault after that, that he found this.

5                   So -- but we -- we could also observe  
6 that there was higher inflows initially than -- than  
7 predicted. And they wanted to -- they wanted to get a  
8 handle on -- on the treatment requirements that they  
9 would -- they would need for the -- for -- as they went  
10 -- went deeper. So it wasn't a requirement of the  
11 permit.

12                   DR. JAMIE VANGULCK: Thank you. Jamie  
13 VanGulck. Specifically for that model, it was rerun  
14 about two point five (2.5) years after operations. I'm  
15 -- I'm guessing that's because that's when enough data  
16 was there to support the decision to recalibrate.

17                   I just wonder if you could comment on  
18 that?

19

20                   (BRIEF PAUSE)

21

22                   MR. RICHARD BARGERY: Richard Bargery,  
23 Dominion Diamond. I'm not sure how far down this path  
24 talking about Diavik, you know, we -- we would want to  
25 go, given -- you know, we're not here representing

1 Diavik. So I think that's -- that's just a comment I -  
2 - I'd like to make. I see -- yeah.

3 THE FACILITATOR: It's Bill Klassen.  
4 This is not an area of my expertise. I'll -- I'll look  
5 to Board staff, or Board advisors, as to the usefulness  
6 of continuing along this line. Sachi or Neil...? Or  
7 Kathy?

8 DR. KATHY RACHER: Kathy Racher, for  
9 the Board. I guess it would just help -- be helpful to  
10 know why you're asking the questions you are, and to  
11 give a context for -- for the questions so that we  
12 could understand how much we need to know about Diavik  
13 versus the -- the current project.

14 DR. JAMIE VANGULCK: Thank you. Jamie  
15 VanGulck, for the GNWT. IR-6 was specifically looking  
16 to understand the inputs to the hydrogeological model.  
17 The Developer has used the Diavik case as -- as one (1)  
18 of the sources of information on how inputs were  
19 selected.

20 So I'm looking to see what sort of  
21 information exist, why -- why it was used, how -- how  
22 important it is, to see if it's relevant and applicable  
23 for the Ekati case. I only have two (2) more questions  
24 on it, so I won't be pushing it very far.

25 THE FACILITATOR: I can -- I have --

1 it's Bill Klassen again. And I -- I need to encourage  
2 people to say their name before they speak so that the  
3 transcriber knows who it is that's on the record.  
4 Thank you.

5 MR. RICHARD BARGERY: It's -- it's  
6 Richard Bargery, Dominion Diamond. I -- I think we can  
7 -- we can speak to lessons learned that we've applied.  
8 I think that that's -- that's legitimate. That's --  
9 that's the -- you know, the extent that -- that we'd go  
10 down that route. So, Don, on that basis...

11 MR. DON CHORLEY: Yes. Diavik was  
12 really the -- the first one that encountered an  
13 enhanced permeability zone of any significance. If you  
14 look at all the other pipes that have been deve --  
15 developed in the Jav pit area, the enhanced  
16 permeability zones are -- are much less transmissive.

17 So it's -- and as we've gone forward,  
18 what we learned from the Diavik was that -- that there  
19 is probably going to be enhanced permeability zones.  
20 You know, they're different sizes. They're different  
21 hydraulic conductivity. And so as we went forward on  
22 other projects that we put this -- put enhanced  
23 permeability zones in that they're -- even if they  
24 weren't necessarily found, we put them in there to be  
25 conservative.

1                   And what we've decided to do at the Jav  
2     pit is to put in the most -- most conservative enhanced  
3     permeability zone that -- in -- in the area, which is  
4     the Duev's Fault.

5                   DR. JAMIE VANGULCK:    Thank you.  Jamie  
6     VanGulck, for the GNWT.  This is the last time I'll  
7     bring up Diavik, I think.  I guess -- so I'll -- I'll  
8     try to focus it on lessons learned, as well.

9                   The -- the recalibration that was done  
10    for the Diavik case relied partly on pumping test  
11    results that was done on Duev's Fault to understand the  
12    hydraulic properties to some extent.  I'm not familiar  
13    with other cases where Duev's Fault hydraulic testing  
14    has been done.

15                  So I'd like to understand further what  
16    sort of hydraulic testing was done for that fault, and  
17    whether it would be applicable to Jav pit after mining  
18    has commenced?

19

20   (BRIEF PAUSE)

21

22                  MR. RICHARD BARGERY:    Richard Bargery,  
23    Dominion Diamond.  This -- I mean, this is down --  
24    still down the Diavik path.  I -- I think, from -- from  
25    our perspective, we'd want to come back -- we'd want to

1 look at what's public information here with respect to  
2 this -- this issue and come back to you.

3 We do have some, but I just want to make  
4 sure that we're -- we're clear on -- on that. So for  
5 this particular one, we'd -- we'd take away that  
6 question and -- and come back with -- with the publicly  
7 available information on this.

8 THE FACILITATOR: It's Bill Klassen.  
9 When do you anticipate you might have that response,  
10 Richard?

11 MR. RICHARD BARGER: Richard Barger,  
12 Dominion Diamond. We -- we'd have it before the end of  
13 the -- the end of the technical sessions.

14 THE FACILITATOR: Thank you. See -- do  
15 you have another question, Jamie?

16 DR. JAMIE VANGULCK: Thank you for that  
17 commitment. It's Jamie VanGulck, for the GNWT.

18 THE FACILITATOR: Excuse me. It's Bill  
19 Klassen. I think we need to record something, here.  
20 Go ahead, Sachi.

21 MS. SACHI DE SOUZA: Just for our  
22 record for the end of the day, the -- the homework  
23 question, as we will word it, is to clarify the pumping  
24 test data done for the Dewev's Fault and the  
25 applicability of it for the Jav estimates.

1 Is that fair from both parties here?

2 DR. JAMIE VANGULCK: Thanks. Jamie  
3 VanGulck. I'd be specifically looking for the -- the  
4 type of hydraulic testing or pumping test that was done  
5 for the enhanced permeability zone for the Diavik case,  
6 and the applicability of completing such testing for  
7 Ekati. I'm guessing that would be at a time frame  
8 after mine pit development, but I'm not sure, because I  
9 don't know the data.

10 MR. RICHARD BARGER: Richard Barger,  
11 Dominion Diamond. Yes, on the basis of, you know,  
12 what's publicly available, I think we can -- we can do  
13 that. And I think we can do that by the end of the  
14 technical sessions.

15 THE FACILITATOR: Okay. Thank you.  
16 It's Bill Klassen. Would you proceed, then, Jamie? Do  
17 you have another question?

18 DR. JAMIE VANGULCK: Yes. Jamie  
19 VanGulck, for the GNWT. The -- the current modelling  
20 is predictive case with some uncertainties regarding  
21 the enhanced permeability zone. We understand that  
22 that's a critical component in the model that drives  
23 the pit inflows and the water quality.

24 There is not yet data to calibrate the  
25 model to conditions during mining, and I'm looking to

1 see if model recalibration would be appropriate --  
2 would be appropriate to complete, and when would that  
3 be appropriate to complete?

4

5 (BRIEF PAUSE)

6

7 MR. DON CHORLEY: Yeah, we would -- we  
8 would probably be looking at recalibrating the model  
9 during -- during mining, because we would need that  
10 information because it -- we'll have to see how that  
11 would be handled in the -- in the Water Management  
12 Plan, how you're going to handle it and -- and so we  
13 would be looking at -- at recalibration if -- if the --  
14 if the predictions are -- are what we expect to be  
15 below the -- below what we are predicting in this  
16 conservative case. So we -- we would be updating that  
17 model. Don Chorley, Golder.

18 THE FACILITATOR: Thank you. I was  
19 just going to say that for you. It's Bill Klassen.

20 DR. JAMIE VANGULCK: Thank you for  
21 that. Jamie VanGulck, for the GNWT. Any model  
22 recalibration is going to need data to -- to support  
23 it.

24 Could you describe a little bit further  
25 the type of monitoring data or further hydrogeological

1 data that may be obtained -- that could be obtained  
2 between now and then?

3

4 (BRIEF PAUSE)

5

6 MR. ELLIOT HOLLAND: Elliot Holland,  
7 Dominion Diamond. We're currently conducting an  
8 additional hydrogeological investigation program to  
9 provide additional confidence in our predictions.

10 DR. JAMIE VANGULCK: Jamie VanGulck,  
11 for the GNWT. Could you comment on any monitoring  
12 during operations and what type of monitoring and may -  
13 - the groundwater to understand the -- the potentials  
14 and the water quality in the groundwater during  
15 operations, and possibly also maybe pit inflow? I'm  
16 guessing that would be another key component for  
17 monitoring. I'm looking to find further information on  
18 the monitoring program during operations that would  
19 feed into model recalibration.

20

21 (BRIEF PAUSE)

22

23 MR. DON CHORLEY: Don Chorley, of  
24 Golder. The types of monitoring we'd be looking at  
25 would be measuring the water quality and quantity, and



1 the -- the parameters that would be chosen for that  
2 quality have to be developed during the -- during the  
3 monitoring plan phase -- during the permitting phase.

4 THE FACILITATOR: Thank you. It's Bill  
5 Klassen. I think Sachi has a question with respect to  
6 the additional work that's being done.

7 MS. SACHI DE SOUZA: I understand you  
8 guys are -- you've done some drilling to date and  
9 there's probably more going on right now.

10 Will that data be incorporated prior --  
11 during the rest of this EA? Or is it going to be  
12 incorporated in the next regulatory phase? I'm just  
13 wondering in terms of the predictions if they're going  
14 to be fine tuned during our process.

15

16 (BRIEF PAUSE)

17

18 MR. ELLIOT HOLLAND: Elliot Holland,  
19 from Dominion. We don't expect to be fine tuning our  
20 predictions, but we can provide a -- a summary of -- of  
21 those results. And, you know, describe qualitatively  
22 how they -- how they line up with our previous  
23 predictions. So we -- you know, we believe the -- we  
24 believe the conservative case will, you know, continue  
25 to be the -- the most -- the most appropriate for --

1 for this process.

2 MS. SACHI DE SOUZA: So that's fair. I  
3 guess the question is if -- if there is additional  
4 information that confirms the conservative case or  
5 conserves the results, it would be useful for all  
6 parties to understand when that information would --  
7 would come in. So if we could get an -- a time  
8 estimation for that?

9 MR. ELLIOT HOLLAND: Elliot Holland,  
10 from Dominion. We can commit to providing that  
11 information by August 1st, 2015 -- '15.

12

13 (BRIEF PAUSE)

14

15 THE FACILITATOR: Thank you. It's Bill  
16 Klassen. Do you have further questions, Jamie?

17 DR. JAMIE VANGULCK: One (1) follow-up  
18 on -- on the response, and then maybe I'll pass it to  
19 others to -- to ask questions. And then I got a few  
20 more on -- on other topics. Okay.

21 Just so I understood the response, the -  
22 - the monitoring program that -- during operations and  
23 construction of the pit, I'm understanding what you're  
24 saying is it would be developed during the regulatory  
25 phase. So I'm hearing that a monitoring program is

1 needed, but you're developing that program at a later  
2 phase of the project?

3 MR. ELLIOT HOLLAND: Elliot Holland,  
4 for Dominion. That -- that program will be developed  
5 during the -- during the permitting phase.

6

7 (BRIEF PAUSE)

8

9 DR. JAMIE VANGULCK: Thank you very  
10 much. I'll -- I'll pass it over to someone else for  
11 the time being.

12 THE FACILITATOR: It's Bill Klassen. I  
13 think Sachi has a question.

14 MS. SACHI DE SOUZA: So just to  
15 confirm, it's going to be a commitment that by August  
16 1st, that update is provided for the updates for the  
17 hydrogeology?

18 MR. ELLIOT HOLLAND: Elliot Holland,  
19 for Dominion. By -- by August 1st, we can commit to  
20 providing a summary of the 2015 hydrogeological results  
21 and -- and a qualitative description of their  
22 implications for a model.

23 THE FACILITATOR: Okay. Thank you.  
24 It's Bill Klassen. Are there other questions having to  
25 with Jav pit, the permeability zone models, and water

1 quality?

2

3 (BRIEF PAUSE)

4

5 THE FACILITATOR: I don't see any --  
6 I'll ask whether there are people -- sorry, is there --  
7 there's another question here on the floor, as soon as  
8 we get a microphone, and then after people in the room  
9 have asked questions, then I'll ask whether there are  
10 questions from those who are on the telephone line, and  
11 then the staff and advisors to the Board.

12 Could you give us your name?

13 MR. GORD MACDONALD: Hi. It's Gord  
14 MacDonald, with Diavik. And, Don, the hydrogeology  
15 predictions on flows and quality are obviously key to  
16 the -- the predictions of flows and changes in the  
17 receiving environment. And, you know, I think we all  
18 get that they are difficult predictions to make, and  
19 particularly early in the development.

20 And -- but we've -- we've seen a lot of  
21 different predictions and -- both underestimates and  
22 overestimates over the last twenty (20) years, over  
23 multiple mining operations.

24 Can -- can Golder provide a -- a best  
25 estimate of confidence limits around the -- around both

1 the flow and the quality predictions? So it's -- lots  
2 of descriptions of conservative and worst case, but can  
3 you put real bounds on actual numbers to the models  
4 that are there? It then would help us all understand  
5 where the -- where some of those scenarios fit.

6 MR. DON CHORLEY: Don Chorley, with  
7 Golder. Yes, I -- I can do that. The -- it would be  
8 my but -- judgment based on scientific judgment and  
9 conservatism. As I said at the beginning, we have a  
10 high level of confidence that we are not  
11 underestimating the -- the effects. So I would put  
12 that at a confidence level of -- of greater than 95  
13 percent -- percentile.

14 I think that the -- the -- so on both  
15 those issues, on both the quan -- quantity and quality,  
16 because that EPZ is -- is pretty clear that it's --  
17 it's the most permeable, it's the most transmissive.  
18 It probably is that way because there's two (2) pipes  
19 that are very close together.

20 The -- so that -- that increases the  
21 total quantity going to the -- to the pit, and it also  
22 increases the -- the concentrations because it provides  
23 a pathway for that more saline water to go up through  
24 the enhanced permeability zone to the -- to the mine.

25 MR. GORD MACDONALD: Gord MacDonald,

1 with Diavik. So, Don, the -- if -- if I understand you  
2 correctlv, if you go to the -- your graphs on -- maybe  
3 one (1) of the ones on flow, or quality, whichever one,  
4 like, that show all the different scenarios? That's  
5 good.

6

7

(BRIEF PAUSE)

8

9 MR. GORD MACDONALD: I think that one's  
10 fine. I'm Gord MacDonald. I -- so one of those  
11 scenarios is that 95th per -- your 95th percent  
12 confidence limit, which would be in this case the --  
13 the green line? I can't see it very well from here.

14 MR. DON CHORLEY: Don Chorlev, Golder.  
15 I'm -- I'm saving greater than ninety-five (95), but  
16 let's -- let's keep it at ninety-five (95) and -- just  
17 for the -- for this conversation.

18 MR. GORD MACDONALD: And so is the  
19 other end the 5 percent, or where would the 5 percent  
20 be? Gord MacDonald, Diavik.

21 MR. DON CHORLEY: Well, you -- you --  
22 Don Chorlev, Golder. That would say that it could be -  
23 - 5 percent could be higher, if you like.

24 MR. GORD MACDONALD: Sorry, what --  
25 what I was trying to get at is the -- is -- is the

1 confidence limits around the -- around the range of --  
2 of possible flows that could be coming. So at one  
3 point, you're saying the 95 percent upper limit would  
4 be the -- the green line. Where would the lower 5  
5 percent be?

6

7

(BRIEF PAUSE)

8

9

THE FACILITATOR: It's Bill Klassen.  
10 For the benefit of those who are on the telephone,  
11 these silences between the asking of question and the  
12 response is the Developers conferring. You can't see  
13 that, obviously, but that's what's taking place.

14

15

(BRIEF PAUSE)

16

17

MR. RICHARD BARGERY: Richard Bargery,  
18 Dominion Diamond. Give us a couple more minutes,  
19 please, Bill.

20

21

(BRIEF PAUSE)

22

23

MR. DON CHORLEY: Don Chorley, of  
24 Golder. We didn't model that 5 percent also. And I  
25 don't know -- you know, it's just based on judgment.

1 Remember that -- that we have not found an enhanced  
2 permeability zone that's -- that's greater than that.  
3 It could be -- it could be 100 percent that we're --  
4 we're getting concentrations lower than that.

5                   That's just what I'm basing my judgment  
6 on right now, is that -- as I said, no, if you were to  
7 find a pre -- a probability distribution for -- for  
8 enhanced permeability zones within the region, you  
9 would look at all the enhanced permeability zones in  
10 the other pipes in the region. They're all less than -  
11 - than the Duev's Fault.

12                   So if you were developing a -- a PDF,  
13 you would say, Probability distribution. You would be  
14 -- Duev's Fault enhanced permeability zone would define  
15 the extreme edge of the permeability of that  
16 probability distribution function.

17                   So we're highly conservative. I -- just  
18 judging at 95 percentile, we haven't looked at -- at  
19 modelling at anything if it was greater than that  
20 inflow.

21                   MR. GORD MACDONALD: Gord MacDonald,  
22 with Diavik. I guess what I'm -- what I'm looking for  
23 is that probability distribution function for flow and  
24 TDS based on all the information you have and the  
25 modelling, with all of those uncertainties, the -- the



1 differences in what you've put into the model, or what  
2 you could put into the model, that would be able to  
3 describe that function so that -- so that we can  
4 understand where these scenarios fit within that  
5 probability distribution.

6

7

(BRIEF PAUSE)

8

9 MR. RICHARD BARGERY: It's Richard  
10 Bargery, from Dominion Diamond. So, as Don said, we  
11 haven't modelled that, and what -- what we have  
12 modelled we think is appropriate for the assessment  
13 that we're doing for Jay project.

14 THE FACILITATOR: Thank you, Richard.  
15 Neil, did you have a -- Neil Hutchinson?

16 DR. NEIL HUTCHINSON: Thank you. Neil  
17 Hutchinson, for the Board. This is just a follow-up to  
18 -- to Gord MacDonald's questions. When you said you  
19 had 95 percent confidence in -- in your estimate for  
20 your model, are you referring to the conservative model  
21 and assumptions that you used for the development of  
22 the assessment report, or the reasonable estimate model  
23 that you've since revised? And which one should we  
24 there -- which estimate should we use to -- to provide  
25 faith in the EA conclusions?

1 (BRIEF PAUSE)

2

3 MR. MICHAEL HERRELL: It's Mike  
4 Herrell, from Golder Associates. I'm going to provide  
5 a presentation on all the -- the model scenarios, the  
6 reasonable estimate case in comparison to the DAR case,  
7 in the -- the water quality presentation.

8 But in -- I'll provide additional  
9 detail, but for -- currently, I'll just state that the  
10 -- in terms of assessing impacts of the project, the --  
11 the conservative case was carried forward to assess  
12 project impacts.

13 The purpose of the reasonable estimate  
14 case was to provide additional context around the  
15 conservatism that was included in the -- the  
16 Developer's Assessment Report and to provide a more  
17 reasonable estimate of what the expected discharge  
18 water quality would be from the Miserv pit to Lac du  
19 Sauvage.

20 DR. NEIL HUTCHINSON: Neil Hutchinson,  
21 for the Board. Thank you. So we can be 95 percent  
22 confident that you're not going to exceed the -- the  
23 conservative range that you used?

24 MR. DON CHORLEY: Ninety-five (95)  
25 plus.

1 DR. NEIL HUTCHINSON: Neil Hutchinson,  
2 for the Board. I didn't hear Gord MacDonald follow up  
3 there, but did we want -- did somebody request an  
4 estimate of the lower range and the probability of the  
5 low range to the high range? Is -- is that a request  
6 that's out there?

7 MR. GORD MACDONALD: Gord MacDonald,  
8 with Diavik. I'm not sure if it's appropriate for me  
9 to make the request, but that was -- that is what I was  
10 asking.

11 MR. ELLIOT HOLLAND: Elliot Holland,  
12 for Dominion. Such a case we don't believe would be  
13 required for -- for the environmental assessment. We  
14 concern ourselves with the -- the larger potential  
15 effects, not the -- the potential for -- for smaller  
16 effects than predicted.

17 MS. SACHI DE SOUZA: Sachi De Souza,  
18 with the Board. The -- I think Dominion's done a good  
19 job of giving a conservative overestimate. I think the  
20 other end of that is: What if you've overestimated it  
21 too far?

22 Which is one (1) of the reasons why,  
23 looking forward into the overall water management,  
24 overall TDS predictions, if -- if you -- if it is  
25 conservative and it's -- it's far away from what

1 actually happens, the Board needs to understand what  
2 the -- what will actually happen, not just the worst  
3 case from an over, but what -- what also is the worst  
4 case from an under-prediction? MR. ELLIOT HOLLAND:  
5 Elliot Holland, for Dominion. That's the purpose of  
6 the reasonable estimate case.

7 MS. SACHI DE SOUZA: So -- it's Sachi  
8 DeSouza, with the Board. Speaking along these lines of  
9 -- of probability distributions, the way it's been  
10 framed so far is the -- the EA case is -- represents  
11 something like a -- a 95 percent level for -- or  
12 confidence for the overestimate and the reasonable case  
13 would be somewhere in the middle of the -- the  
14 distribution.

15 So what happens with the other tail?  
16 And I think that is relevant for understanding the  
17 potential effects.

18 THE FACILITATOR: It's Bill Klassen.  
19 While Dominion Diamond is conferring on the response,  
20 when people use acronyms please clarify what those are.  
21 TDS, I think, means total dissolved solids. Is that  
22 right? And there are probably other acronyms that will  
23 be used. So for those of us who are not working in  
24 this field, please clarify that. Thank you.

25 MR. MICHAEL HERRELL: It's Mike

1 Herrell, from Golder Associates. The -- the purpose of  
2 the -- the DAR is to provide a conservative estimate of  
3 water quality for the purpose of assessing impacts to  
4 surface water quality. That assessment was done as  
5 part of the DAR, and the outcome of that assessment was  
6 there were no significant adverse effects to surface  
7 water quality.

8 If you reduce conservatism in the model,  
9 the effects become lower and lower. So the  
10 concentrations would decrease, but it wouldn't change  
11 the overall outcome of the DAR. And therefore running  
12 a scenario that is less conservative is not really  
13 relevant for this -- for this -- the EA assessment.

14 MS. SACHI DE SOUZA: Sachi DeSouza,  
15 with the Board. I guess we'll leave it there. I've --  
16 I've got some questions later on related to quantity  
17 and quality, and I think the site water management  
18 presentation and hydrology will hopefully answer some  
19 of that and we can -- I can save my questions till  
20 then.

21 THE FACILITATOR: Thank you. It's Bill  
22 Klassen. And perhaps everybody in the room knows this,  
23 but the DAR is D-A-R, a Developer's Assessment Report.  
24 Before I -- I ask the staff of the Board whether they  
25 have questions, are there any questions from those of

1 you who are on the teleconference line? Okay. Hearing  
2 none, there -- are there other questions within the  
3 room? Jamie...?

4 DR. JAMIE VANGULCK: Thank you. Jamie  
5 VanGulck, for the GNWT. I'd like to further understand  
6 this 95 percent confidence a little bit better.

7 Are you saying it's 95 percent  
8 confidence prediction for the TDS concentrations in the  
9 Misery pit discharge? Or is this a 95 percent  
10 confidence in the groundwater predictions only?

11 MR. DON CHORLEY: Don Chorley, of  
12 Golder. No, I can only -- I can only -- my analysis  
13 was only for the flow coming out of the pit.

14 DR. JAMIE VANGULCK: Thank you. Jamie  
15 VanGulck. The reasonable estimate case was provided to  
16 -- to -- I'm guessing as a means to show how -- a  
17 conservative scenario that's more realistic than the  
18 conservative EA case.

19 Do you have a confidence prediction for  
20 the reasonable estimate case as well?

21

22 (BRIEF PAUSE)

23

24 MR. DON CHORLEY: Don Chorley, of  
25 Golder. I don't want to speculate what the -- what the

1 percentile is on that. It's easier to -- to be  
2 conservative than to be -- I expect it -- expect the  
3 case. So we did sensitivities on -- on some of the  
4 parameters to just show that -- how much it would vary  
5 from the -- from the reasonable estimate. And those  
6 are -- those are documented in the -- in the DAR in the  
7 appendix. So I -- I don't -- don't really want to  
8 estimate what that would be.

9 DR. JAMIE VANGULCK: Thank you for  
10 that. Jamie VanGulck. As you're aware, last week the  
11 GNWT passed over a request for further information, to  
12 the Developer, to quantify the -- the uncertainty and  
13 the -- the estimate, and specifically look at the level  
14 of certainty or uncertainty associated with the EPZ.

15 Just so everyone's aware, here on the  
16 Review Board -- and -- and for the Review Board, we  
17 proposed a -- a method that would complete a Monte  
18 Carlo type of analysis to look at different parameters  
19 of the EPZ and other controlling items for pit water  
20 inflow and -- and quality predictions.

21 We understand that from one (1) of the  
22 IR responses, completing a Monte Carlo analysis is time  
23 consuming and may not be practical if you have a -- a  
24 very complex model. So what we proposed is to adjust  
25 the -- the model domain to be a 2D scenario instead of

1 a 3D to be able to accommodate completing such a  
2 analysis.

3 We'd like to further discuss the -- the  
4 possibility to look at quantifying the uncertainty and  
5 assessing the -- the characteristics of that EPZ zone  
6 to put some bounds on these confidence limits. We  
7 haven't heard back from the Developer on -- on that  
8 request that was sent in last week.

9 So I guess at this point we're -- we're  
10 looking to see if there's an appetite to further  
11 discuss that and come up with a -- a method that may be  
12 appropriate for both parties.

13

14 (BRIEF PAUSE)

15

16 MR. DON CHORLEY: Don Chorley, of  
17 Golder Associates. What we referenced here -- and I --  
18 I just prepared a response to that, we ref --  
19 referenced a BCMOE document. I got to look at it here,  
20 because I've got to -- it's "Guidelines for Groundwater  
21 Modelling to Assess Impacts of Proposed Natural  
22 Resource Development Activities." This is the most --  
23 I can provide that reference to -- to the Board after.  
24 It's the most comprehensive document, probably, in  
25 North America. It's -- it's based on a -- a document



1 that was in Australia.

2 There's two (2) -- two (2) methods for -

3 - for assessing conservatism in -- in this document.

4 There's -- the first method is the method that we used,

5 is the deterministic method, which is you use a -- an

6 expected case. We don't like to call it expected case.

7 We want to call it a -- a reasonable estimate, because

8 there is some conservatism in that. And the -- and the

9 conservative case, which we've done in this -- in this

10 analysis. The other method is to use a Monte Carlo

11 method, but they caution that the Monte Carlo method

12 can only be used if you can populate the -- the

13 probability distribution functions. Okay.

14 Now, I just want you to recall that that

15 EPZ is an assumed structure that is going through that.

16 I -- the only way you could develop a probability

17 distribution function for that would be by judgment or

18 by using the data from pipes in the vicinity, which all

19 have lower transmissivity -- they're not as -- as large

20 as Duev's Fault.

21 So we don't think that that would add

22 any value to this, because I can just use the judgment

23 that I've just done and said that this 95 percentile

24 plus confidence level.

25 THE FACILITATOR: Thank you. I believe

1 Sachi has a -- an observation here.

2 MS. SACHI DE SOUZA: Before we go into  
3 further conversations about probability distribution  
4 functions and deterministic models, I wonder if this  
5 might be a good conversation to have over lunch, or  
6 over the break between GNWT and Dominion, as opposed to  
7 at this point in time in this venue.

8 THE FACILITATOR: Thank you. As the --  
9 the facilitator, what I'd like to do at this point is  
10 to have questions from the Board staff and Board  
11 advisors and then take a break, if that's acceptable?

12

13 (BRIEF PAUSE)

14

15 THE FACILITATOR: So seeing no violent  
16 protest, we'll proceed that --

17 MR. RICHARD BARGERY: I -- could I  
18 violently protest? Sorry. Richard Bargery, Dominion  
19 Diamond. I don't have a problem with Sachi's  
20 suggestion on the -- the first issue, to -- to have a  
21 discussion with the GNWT at the break.

22 But I was wondering for other reasons if  
23 we could have a break now as opposed to -- before the  
24 Board staff start questions that may go for -- for a  
25 few minutes?

1 THE FACILITATOR: Yes, I -- I'm quite -  
2 - quite agreeable to that. It's Bill Klassen. So  
3 we'll take a ten (10) minute break here, and then we'll  
4 come back and start with questions from Board staff on  
5 this topic.

6

7 --- Upon recessing at 10:20 a.m.

8 --- Upon resuming at 10:32 a.m.

9

10 THE FACILITATOR: Our ten (10) minute  
11 break is over. I don't want to embarrass people but  
12 there are certain individuals who need to be at the  
13 table to be asking questions, Neil and Kathy. So...

14

15 (BRIEF PAUSE)

16

17 THE FACILITATOR: And they didn't hear  
18 me. Here comes Kathy. Neil, I need you at the table.  
19 It's Bill Klassen. Just so the record knows that I was  
20 the one that was being cursed. We have -- we're still  
21 on the subject of the -- the Jay pit and the three (3)  
22 topics that were on the screen behind me.

23 So I -- I know that there are questions  
24 from some of the Board staff, Board advisors, and so  
25 we'll start with Neil.

1 DR. NEIL HUTCHINSON: Thank you. Neil  
2 Hutchinson, for the Board. This is regarding the --  
3 the Board's IR-29, which was concerned with the -- the  
4 wet blasting environment -- potential for wet blasting  
5 environment in the Jav pit in the event of higher -- in  
6 the event of higher than expected flows of groundwater.

7 And we had asked you to go back and  
8 rerun the water quality model using some ammonia values  
9 to reflect the potential that ammonia ANFO wouldn't  
10 explode completely, and we've run into a problem  
11 similar to that that was seen at Diavik with higher  
12 than expected ammonia levels in the sump water.

13 So you did that, and you concluded that  
14 it was groundwater quantity and not quality would have  
15 the bigger effect on the Miserv pit quality. But you  
16 said you -- you reached that conclusion by using data  
17 from the sumps at Ekati where ammonia was 5.5  
18 milligrams per litre and nitrate was twenty-two point  
19 six (22.6).

20 I guess my question is: If the concern  
21 is unexploded blast residue, wouldn't it be better to  
22 use values from the Diavik experience where you would  
23 expect that the ammonia and nitrate would have been  
24 higher, and how that would have changed your outcome?  
25

1 (BRIEF PAUSE)

2

3 MR. RICHARD BARGERY: Richard Bargery,  
4 Dominion Diamond. That first point, I -- I'm not sure  
5 we have that data from -- from Diavik. Perhaps it's  
6 publicly available. I -- I don't know, and no one --  
7 no one here knows at this point.

8 Second is, more appropriate for -- from  
9 our perspective, at least, to -- to use the operational  
10 practices at Ekati as the basis for -- for that  
11 particular analysis.

12 DR. NEIL HUTCHINSON: Neil Hutchinson,  
13 for the Board. In the previous discussions we just  
14 had, though, we heard that the Duev's Fault is wetter  
15 than anything that's been encountered at Ekati. And so  
16 you wouldn't be running into the same type of wet pit  
17 environment as has been envisioned here.

18 And secondly, I might ask Kathy Racher,  
19 from her experience with the Wek'eezhii Board, that I  
20 believe that sump data would be in the annual water  
21 reports from Diavik. Is -- would that be reasonable?

22 DR. KATHY RACHER: Kathy Racher, on  
23 behalf of the Board. Yeah. So that's -- that's the  
24 point. You're -- you're using the EPZ from Duev's  
25 Fault to -- to model your worst case, which is -- which

1 is a good -- reasonable for the worst case.

2 But -- and -- and because of that fault  
3 -- or one (1) of the contributing factors of that fault  
4 was higher than expected levels of ammonia in the  
5 Diavik sumps for a period of time, which they  
6 eventually got under control. So I guess that's -- and  
7 that data, of course, is available on the Wek'eezhii  
8 Land and Water Board website.

9

10 (BRIEF PAUSE)

11

12 MR. ERIC DENHOLM: Oh, hi. It's Eric  
13 Denholm speaking. So, yeah. So we're -- we're going  
14 back to the -- the IR you -- you referred to, 29, I  
15 think, Neil. I made a note of it here. So the  
16 approach taken, just to -- just to sort of restate, the  
17 approach taken to -- to -- in the assessment was to use  
18 the ammonia -- as you said, the -- the ammonia values  
19 from pit sumps at Ekati mine.

20 When that's combined with what Don was  
21 describing as the EA case for -- for pit inflows, what  
22 you end up with is quite -- quite a conservative then  
23 ammonia load, if you like, coming -- you know,  
24 estimated coming out of the pit sumps and into the mine  
25 water modelling. And so that was -- that's the basis

1 of -- of the conservative approach for -- for ammonia  
2 specifically.

3                   Also, I would just -- I'd just remind  
4 you that -- and everyone that the -- one (1) of the  
5 real strengths of the minewater plan here for the Jay  
6 project is this timeframe of five (5) to six (6) years  
7 before discharge to the receiving environment is  
8 required. So that's a -- that's a substantive amount  
9 of time to -- to collect site-specific information on  
10 pit inflows, ammonia concentrations, et cetera, with --  
11 basically without risk to the receiving environment.

12                   DR. NEIL HUTCHINSON: Neil Hutchinson,  
13 for the Board. No, thanks, Eric. I -- I appreciate  
14 that you -- you think you've done a conservative  
15 analysis. But of course, if your ammonia  
16 concentrations are not as high as they might be, or as  
17 they were in the Diavik case, your analysis would not  
18 have been conservative.

19                   Your loads would be higher, and we do  
20 need to know how much higher they would be, recognizing  
21 that there's this delay period. But we need to know  
22 what the ammonia management challenges might be in the  
23 Misery pit.

24

25                   (BRIEF PAUSE)

1 MR. RICHARD BARGERY: It's Richard  
2 Bargery, Dominion Diamond. I -- I think what we'll do  
3 then, Neil, based on the discussion here, is we'll --  
4 we'll take away the point. We'll have a discussion  
5 about it as -- as a team about utilizing the -- using  
6 the -- the Diavik numbers, and we'll come back -- come  
7 back with a response in the morning about -- about our  
8 view on this.

9 DR. NEIL HUTCHINSON: Neil Hutchinson,  
10 for the Board. I'll ask Teacher Klassen here just to  
11 mark that down as a homework assignment.

12 THE FACILITATOR: Thank you. It's Bill  
13 Klassen. Sachi or Chuck, do you need any elaboration  
14 on exactly what it is we'll be looking for from  
15 Dominion Diamonds?

16 MS. SACHI DE SOUZA: Can we please  
17 restate that? Sorry.

18 DR. NEIL HUTCHINSON: Neil Hutchinson,  
19 for the Board. I -- I believe there -- there's an  
20 assignment here for Dominion Diamonds to review the --  
21 the need to incorporate Diavik's wet sump ammonia and  
22 nitrate levels into their -- into their water quality  
23 model for the Misery pit as an example of the  
24 implications of -- of a wet blast environment. And you  
25 -- you are simply going to discuss that and come back



1 and tell us what your approach is going to be.

2 Would that be what you agreed to?

3 MR. RICHARD BARGERY: Richard Bargery,  
4 Dominion Diamond. Yes.

5 THE FACILITATOR: It's Bill Klassen.

6 Thank you. Are there other questions from Board staff  
7 or advisors?

8 MS. SACHI DE SOUZA: Just a  
9 clarification for me. I -- I might have missed it in  
10 your presentation this morning.

11 Does the groundwater model assume that  
12 there's no connection between Lac du Savage and the  
13 EPZ?

14 MR. DON CHORLEY: Don Chorley, of  
15 Golder. No, there is a connection with the Lac du  
16 Sauvage.

17 THE FACILITATOR: It's Bill Klassen.  
18 If there aren't more questions, then, and related to  
19 Jav pit and water quality model inputs and the enhanced  
20 permeability zone there, shall we move on? I guess we  
21 shall not. Jamie...?

22 DR. JAMIE VANGULCK: Thank you. Jamie  
23 VanGulck, for the GNWT. I have some fairly detailed  
24 questions that are related to Information Request 8.  
25 And I guess I'll be referencing Appendix 8A, some of

1 the tables and -- and pages in there. IR-8 dealt with  
2 the predictions of quantity and quality of pit inflows  
3 from the -- from the model. The 3D model was presented  
4 in Appendix 8A.

5 Specifically, table 8 -- sorry. Yeah,  
6 8A3-5 presents the different periods that were assessed  
7 during construction, the open pit mining, and then into  
8 closure. Period 13 deals with the closure, and then  
9 period 14 deals with the sump flooding.

10 Just so I'm clear, is it the end of  
11 period 13 -- the results from the 3D model for end of  
12 period 13 that the -- is that the starting conditions  
13 for the 2D model?

14

15 (BRIEF PAUSE)

16

17 MR. RICHARD BARGERY: Richard Bargery,  
18 Dominion Diamond. Just one (1) second. We're looking  
19 for the various references, here.

20

21 (BRIEF PAUSE)

22

23 MR. RICHARD BARGERY: Richard Bargery,  
24 Dominion Diamond. We just -- we have -- we're going to  
25 have to check on that and get back to you on the exact

1 -- the exact answer, and we'll try to get that quickly,  
2 so.

3 THE FACILITATOR: It's Bill Klassen.  
4 Richard, will that -- will that be later today, or...?

5

6 (BRIEF PAUSE)

7

8 MR. RICHARD BARGERY: Richard Bargery,  
9 Dominion Diamond. Yes.

10 THE FACILITATOR: Thank you. It's Bill  
11 Klassen. I -- I should inform people that the meeting  
12 that was suggested between GNWT and Dominion Diamonds,  
13 the Mackenzie Valley Environmental Impact Review Board  
14 process provides for such meetings off to the side.  
15 But there is a report form that the Board has that they  
16 ask parties to complete, and then that information -- a  
17 report from those meetings goes on the -- the registry  
18 so that others who aren't at those meetings are aware  
19 of what was discussed.

20 Okay. Sachi...?

21 MS. SACHI DE SOUZA: To clarify the  
22 homework question there, it is that Dominion is going  
23 to confirm the inputs for the post-closure model are  
24 based on the closure -- or the end of operations  
25 conditions?

1 DR. JAMIE VANGULCK: Jamie Vangulck.

2 Yes, I -- I guess specifically is it end of period 13  
3 or end of period 14 3D results is that fed as the  
4 initial conditions for the post-closure model to 2D.  
5 Yeah.

6 Jamie Vangulck, for the GNWT. I've got  
7 another question regarding Table 8A3-5. The  
8 groundwater inflows that are predicted for period 14  
9 have a -- a negative flux value compared to the  
10 previous time period that has a positive. And also,  
11 period 14 has a, I guess, a non-applicable value for  
12 the groundwater quality, whereas the previous period  
13 has a -- a concentration of 2,300 milligrams per litre.

14 Could you further explain what's  
15 happening between period 13 and 14 with regards to the  
16 filling of the pit and filling of the -- the area  
17 behind the dike above the crest of the pit, and why you  
18 would have a negative value for groundwater flow in  
19 period 14, and the -- the basis for a non-applicable  
20 concentration for TDS there?

21

22 (BRIEF PAUSE)

23

24 MR. DON CHORLEY: The reason why it's a  
25 negative value is that actually -- Don Chorley, Golder

1 -- is that actually water is going out -- out of the --  
2 the pit when it's flooded. It's going out, so it's not  
3 directed into the pit, so -- do you understand?

4 DR. JAMIE VANGULCK: Jamie VanGulck.  
5 So if I understand things, the -- and please correct me  
6 if I'm wrong, period 13 is the filling of the pit up to  
7 the top of the pit level, and period 14 is the -- the  
8 water infilling up to the top of the dike level.

9 Is -- is my understanding correct there?

10 MR. DON CHORLEY: Yes, that's correct.  
11 Don Chorley, Golder.

12 DR. JAMIE VANGULCK: Thank you. Jamie  
13 VanGulck. So the negative value for groundwater inflow  
14 in period 14, is that related to water entering the --  
15 the foundation soils? That would be the -- the lake  
16 bottom sediment above the bedrock?

17

18 (BRIEF PAUSE)

19

20 MR. DON CHORLEY: Don Chorley, Golder.  
21 No, it's not just the lake bed sediments. It's the  
22 whole flooded part of the -- the pit, because when it's  
23 completely flooded, it's got a higher gradient, then,  
24 so it --

25 DR. JAMIE VANGULCK: Jamie VanGulck.

1 Just so I understand the physics of it better, the --  
2 in Period 14, then, the water level within the dike  
3 area would be largely the same as the water level  
4 outside of the -- of the pit area. So where's the --  
5 the gradient for flow coming from?

6

7

(BRIEF PAUSE)

8

9 MR. DON CHORLEY: The gradients --  
10 because the -- the area around the pit is actually  
11 still de-watered, so it still has lower -- lower  
12 pressure, so it's -- it's just kind of equilibrating  
13 that to a hydrostatic. Don Chorley, Golder.

14 DR. JAMIE VANGULCK: Jamie VanGulck.  
15 Thank you for that. Could you also address the -- the  
16 groundwater quality for Period 14? What does 'not  
17 applicable' mean?

18

19

(BRIEF PAUSE)

20

21

MR. DON CHORLEY: Don Chorley, Golder.

22

23

(BRIEF PAUSE)

24

25

MR. DON CHORLEY: Yeah. Don Chorley,

1 Golder. During that period, there's no -- there's no  
2 masses going out, but they're going into the pit, so  
3 there's no -- there's no loss to the -- you know.

4 DR. JAMIE VANGULCK: Jamie VanGulck.  
5 So if I'm understanding things right, then, this table  
6 for groundwater quality would show the -- the  
7 groundwater quality leaving the -- the formation and  
8 entering the pit, but in Period 14 we actually had  
9 water entering the formation from the pit. The pit  
10 water quality would have some TDS. I don't know what  
11 that would be at that point in time.

12 Is that considered in the model?

13 MR. MICHAEL HERRELL: It's Mike  
14 Herrell, from Golder Associates. Yeah, that's  
15 considered in the -- the site water quality model. So  
16 we simulate water quality in the pit, and there's a  
17 mass loss associated with that at that flow rate from  
18 the pit.

19 DR. JAMIE VANGULCK: Jamie VanGulck,  
20 for the GNWT. Is it considered in the -- the 2D post-  
21 closure groundwater model?

22

23 (BRIEF PAUSE)

24

25 MR. DON CHORLEY: Don Chorley, Golder.

1 Yes.

2 DR. JAMIE VANGULCK: Jamie VanGulck.

3 So Period 14 has a -- a -- an 'NA' value for  
4 groundwater quality. Was that a model input, then, for  
5 Period 14, or is that -- what was assumed for the pit  
6 water quality in the -- in the pit for Period 14?

7 MR. DON CHORLEY: Don Chorley, of  
8 Golder. No, it's a calculated value. It's not an  
9 assumed value.

10

11 (BRIEF PAUSE)

12

13 DR. JAMIE VANGULCK: Jamie VanGulck.

14 I'm still not understanding what your conditions are at  
15 the boundary of the pit wall and the lake bed sediments  
16 during that Period 14 for the concentrations of TDS.  
17 Your -- what I'm hearing is the groundwater quality  
18 leaving the pit, or leaving the -- the formation is a  
19 calculated value. But we're, for Period 14, looking at  
20 a -- a scenario where water is entering the formation  
21 from the -- the nearby water source.

22 THE FACILITATOR: It's Bill Klassen.

23 I'll ask Sachi to comment on this. MS. SACHI DE

24 SOUZA: Jamie, I think you're getting to discussions  
25 for closure predictions, and I'm wondering if it might



1 be better to leave it for the afternoon when we talk  
2 about closure, if that's okay.

3 DR. JAMIE VANGULCK: That's perfectly  
4 fine. Thank you.

5 THE FACILITATOR: Okay. It's Bill  
6 Klassen. Does that then allow us now to move on to --  
7 I -- I don't see the agenda. Hydrology I think was the  
8 next larger topic here.

9 Are there questions related to hydrology  
10 and model design, effects of wet and dry years? It was  
11 included in the previous presentation.

12

13 (BRIEF PAUSE)

14

15 MR. RICHARD BARGERY: Richard Bargery,  
16 Dominion Diamond. We have a combined presentation that  
17 deals with hydrology, water quality, and mine  
18 management plan. So why don't we just provide that  
19 entire presentation now, and...?

20 THE FACILITATOR: All right. Let's  
21 proceed with that, then. Thank you.

22

23 (BRIEF PAUSE)

24

25 MR. RICHARD BARGERY: I lost Bill.

1 Richard Bargerv, Dominion Diamond. So this is going to  
2 be broken up into a number of -- there are a number of  
3 things in this presentation, so a number of -- we're  
4 going to have a number of people presenting. But I  
5 think John Faithful is -- is going to start. I don't  
6 see Bill, but, Sachi, we can go -- start? Yeah.

7

8 PRESENTATION BY DOMINION DIAMOND - WATER MANAGEMENT,  
9 HYDROLOGY, AND WATER OUALITY:

10 MR. JOHN FAITHFUL: I'm John Faithful,  
11 from Golder Associates. So as -- as Rick indicated, we  
12 -- we've got a couple of component themes along the  
13 aquatics line that we're going to speak to over the  
14 next fifteen (15) to twenty (20) minutes.

15 We're going to initiate a -- a  
16 discussion on the Mine Water Management Plan, and  
17 that'll be provided by Fiona Esford. Hvdrology will be  
18 discussed by Nathan Schmidt, and then water quality  
19 modelling and water quality will be -- will be carried  
20 forward by Mike Herrell and myself.

21 MS. FIONA ESFORD: As discussed on  
22 Monday, but also I'll refresh because I realize several  
23 of you were not in the audience at that time, the  
24 minewater management system proposed for the Jay  
25 project takes advantage of the existing open pits for

1 water storage during dewatering once concentrations of  
2 suspended sediments increase and are no longer  
3 acceptable for direct discharge to Lac Du Sauvage.  
4 This water will be pumped through the pipelines to the  
5 Miserv and Lvnv pits.

6                   We had one particular IR asking for  
7 clarification on the location of the direct discharge  
8 to Lac du Sauvage, and it's shown schematically here by  
9 those two (2) red arrows that are connected to the  
10 discharge pipelines into Lac du Sauvage.

11                   During operations, the Miserv pit will  
12 continue to be used for water management. Both surface  
13 water runoff that enters the Jav pit and the  
14 groundwater entering the Jav pit will be pumped through  
15 two (2) separate pipelines to the Miserv pit. The  
16 groundwater will be pumped into the base of the pit,  
17 and the surface water will be pumped to the top of the  
18 Miserv pit.

19                   After year 5 of the Jav pit operations,  
20 based on the DAR conservative estimate case, discharge  
21 of water from the top of Miserv pit will go into Lac du  
22 Sauvage through an engineered diffuser. With the  
23 reasonable estimate case, this discharge is delayed by  
24 approximately one (1) year and the discharge would  
25 begin in year 6 of the operations. This overall water

1 management approach has benefits to the operation at --  
2 and is protective of the environment.

3                   Dominion will have five (5) to six (6)  
4 years of operation to monitor water quality and  
5 quantity that flows into the Jav pit and the overall  
6 water quality within the Miserv pit to validate the  
7 predictions in the modelling prior to initiation of any  
8 discharge into Lac du Sauvage. This delay in discharge  
9 has a second benefit to the overall water quality in  
10 the further downstream receiving environment of Lac de  
11 Gras as any overlap between the timing of the Jav  
12 discharge and anticipated discharges associated with  
13 the A-21 at Diavik mine are reduced or eliminated.

14                   Then in closure, water from the upper  
15 portion of Miserv pit is transferred back into the  
16 lower part of Jav and then a fresh water cap with water  
17 from Lac du Sauvage is -- is then -- will the be  
18 established in both the Miserv and the Jav pits.

19                   Next slide. One (1) of the IRs had  
20 specific questions related to the contributing area of  
21 the waste rock storage area footprint and where any  
22 seepage or runoff would -- would report. And this  
23 figure was submitted to explain that.

24                   Next slide. The mine Water Management  
25 Plan --Plan has various adaptive management strategies

1 built into it. And -- and these are listed in the DAR  
2 and also on this slide for your reference. And I'm  
3 sure there'll be discussion later this afternoon  
4 related to these things.

5 Next slide.

6 MR. NATHAN SCHMIDT: Nathan Schmidt,  
7 with Golder Associates. I'd like to say a few things  
8 about the hydrology to give an update. Since the DAR  
9 came out we've continued with supplemental baseline  
10 collection at a full-year program in 2014, and also a  
11 2015 program that is just about to get underway. These  
12 include continuous monitoring seasonally during the  
13 open-water period at a number of the lakes of interest.

14 We actually kept our monitoring  
15 instruments in at Lac du Sauvage and Lac de Gras  
16 outlets over winter this year, so we'll have some --  
17 some full-year data for the first time at those outlets  
18 and additional surveys to, you know, confirm what we  
19 had based our model on. The 2015 program will also  
20 extend down to the Lac du Sauvage outlet and gain us a  
21 little more information there.

22 I do want to say that the DAR in Section  
23 6.6 talks about how, you know, uncertainty may be  
24 addressed in one (1) aspect by additional mitigation  
25 and also follow-up and monitoring programs. And that -

1 - that is what we're doing this for, is to -- to  
2 address those uncertainties as the project proceeds.

3                   We had a number of questions about model  
4 calibration and uncertainties. We put together a water  
5 balance model that we're -- we're very happy with,  
6 we're very proud of. It's based on, you know, the  
7 physical aspects of the -- the watershed and also to  
8 capture the -- the wet and dry conditions. What it  
9 does is it uses a derived meteorological data set that  
10 is long term. And so it does capture those wets and  
11 dries, those highs and lows.

12                   There is uncertainty associated with  
13 them, and I'll talk about some of those things in the -  
14 - on -- in some of the inputs, and I'll speak about  
15 those things in some subsequent slides here. I think a  
16 key message is that the uncertainty isn't enough to  
17 change the results of the assessment. We pass our  
18 information downstream to the water quality, to  
19 fisheries, to traditional land use. And we don't see  
20 that any -- any uncertainties there are affect -- are  
21 great enough to affect the outcomes of those  
22 assessments.

23                   Now, in the planning and design of the  
24 project, like I said, adaptive management strategies  
25 will be applied -- will be applied. If we do see

1 conditions that are, you know, sufficiently different  
2 from what we've predicted and there -- there are ample  
3 opportunities to apply those.

4                   Some of the specific questions we had  
5 related to building blocks of our model. And one (1)  
6 of the issues there was runoff coefficients, the fact  
7 that they seemed a little bit high. And I think the --  
8 the root cause of that is there's -- there's kind of an  
9 apples-and-oranges comparison where the runoff  
10 coefficients in our model in the building block aren't  
11 the same as the ones that you get out of the monitoring  
12 data from, say, the outlet of a lake. Ours apply only  
13 to land surface areas. And they also take into account  
14 sublimation snow -- sub -- sublimation losses along the  
15 way.

16                   And so at the end of the day the output  
17 of our model is actually calibrated to a runoff  
18 coefficient, a water yield, at the Desteffany Lake  
19 outlet on the Coppermine River. And so we have a  
20 pretty high level of confidence with that.

21                   There were some other questions in the  
22 IR about precipitation undercatch. You know, we -- we  
23 do see some variability in there. And there can be  
24 both spatial and temporal variability in undercatch.  
25 But again, to some extent that is compensated for with

1 our calibrated runoff coefficient values.

2                   Stage-discharge rating curves. There  
3 were some questions about that, because what our model  
4 does is it takes these cascades of flows from the upper  
5 watershed down to the terminal lakes and it stores  
6 water in those lakes. And the rate at which it  
7 releases those -- that water is related to the  
8 conditions at the outlet.

9                   We have site-specific information at  
10 many of those outlets. The larger lakes are what we  
11 concentrated on, the ones in the lower watershed. We  
12 applied a different process to lakes in the upper  
13 watershed. And, yes, there is some uncertainty in  
14 there, but those are in the smaller watersheds. And  
15 what we think is that the -- some of them may be a  
16 little high, some of them may be a little low, but by  
17 the time we get down to the -- the bigger lakes in the  
18 lower watershed, that balances out.

19                   And a final question there about lake  
20 stage-storage relationships. And essentially with the  
21 way the model works with these lakes is it -- we don't  
22 need to know what the bathymetry is like underneath the  
23 water surface at low water. All that matters is what  
24 happens as the -- the water level goes from low water  
25 to high water and back to low water over the course of



1 a year.

2                   And if you've been to site, I mean, we  
3 don't see a lot of, you know, long, sloping beaches  
4 where we'd have, you know, large increases in lake  
5 water surface area with increases in -- in water  
6 surface elevation. We have things like you see in that  
7 photograph there where it's almost a -- a vertical wall  
8 along a lot of these shorelines.

9                   Additionally to that, what we see at  
10 site is that we don't have large -- and by large I'd  
11 say, you know, a metre or greater -- fluctuations in  
12 water level in a typical lake over the course of a  
13 year. Typically we'll see, you know, .3, .5 metre  
14 fluctuations. And so the model's not sensitive to --  
15 to those assumptions.

16                  Finally, I do want to say something  
17 about ice modelling. A lot of, you know, questions  
18 we've had about that over the course of the project and  
19 some of our field surveys have focussed on that. There  
20 is uncertainty, but what we do have a pretty good  
21 handle on is the small lakes, you know, freezing solid  
22 to the bottom over the winter. And we have a pretty  
23 good handle with our modelling on when those open up in  
24 the spring and when those freeze up in the fall.

25                  With the larger lakes, such as Lac du

1 Sauvage and Lac de Gras, you know, we're starting to  
2 collect some observations. And we have included  
3 constrictions on flow at the outlets in the wintertime.  
4 It's a fairly coarse sort of approach, but again, since  
5 those are low flow periods, we don't think that they're  
6 a great influence on the overall model.

7 MR. MICHAEL HERRELL: It's Mike  
8 Herrell, from Golder Associates. I'm going to talk  
9 about the -- the water quality model that was included  
10 in the DAR and focussing on some of the key themes that  
11 were raised as part of the -- the IR process, as well  
12 as the -- the updates that have been completed since  
13 submission of the -- the Developer's Assessment Report.

14 So on this figure here, this is the --  
15 the overall conceptual model that was included in the -  
16 - in -- in the Developer's Assessment Report and was  
17 carried forward into subsequent updates. The -- the  
18 key -- the key message behind this slide is a  
19 comprehensive water quality mod -- modelling assessment  
20 has been completed for the -- the Jay project that  
21 includes inputs from the -- Don's hydrogeological model  
22 which he just previously presented, as well as Nathan's  
23 water balance. And a site water balance was completed.

24 The -- the purpose of the models was to  
25 predict the discharge water quality from the project

1 during operations, and also during closure and post-  
2 closure, as well as carry those projections downstream  
3 to evaluate changes to surface water quality.

4 Modelling is an iter -- iterative  
5 process, and since submission of the DAR several  
6 updates have been completed to the models based on  
7 additional information that has become available, and  
8 also two (2) additional sensitivities were included to  
9 support Information Request responses.

10 So in this table here, there's a list of  
11 the -- the key changes that were made to the model. An  
12 updated assessment case was completed to account for  
13 updated discharge flows that have been filed by Diavik,  
14 and as well as some modifications were made to the Pit  
15 Lake hydrodynamic model as part of that -- that update.

16 A no Jav development case was also  
17 completed to address the changes to water quality in  
18 Lac du Sauvage and Lac de Gras for a scenario that  
19 doesn't consider the -- the Jav project.

20 And the reasonable estimate case which  
21 was introduced this morning was completed to provide  
22 additional context to the -- the Developer's assessment  
23 result -- results, which were based on conservative  
24 input assumptions. So this is to provide a more  
25 reasonable estimate of what the discharge water quality

1 would be.

2                   And finally, as part of the adequacy  
3 review of the Developer's Assessment Report, a comment  
4 was made with respect to the -- the domain of the --  
5 the assessment which was to the outlet of Lac de Gras.  
6 And that was updated to -- to model further downstream  
7 and to Desteffany Lake to address that comment. So  
8 I'll go through -- I'll spend a few minutes going  
9 through each of these model updates in the -- in the  
10 next few slides.

11                   So the -- the first -- the first update  
12 was the -- the updated assessment case. The key  
13 changes to that model were the -- the Developer's  
14 Assessment Report was based on flows from the Diavik  
15 Mine Water Management Plan, Version 12. And since  
16 submission of the DAR, an update to that -- those flows  
17 was pro -- or submitted to the Board, which includes  
18 the -- the development of A21. So the model was  
19 updated to in -- include the flows associated with that  
20 latest Water Management Plan.

21                   As part of that update, a review of the  
22 -- some of the pit lake water qual -- the -- the pit  
23 lake hydrodynamic model inputs was completed and -- and  
24 changed to -- to increase the -- the conservatism  
25 around some of those models. So these are related to

1 wind sheltering and dynamic shading, which influence  
2 the amount of wind that's available for mixing.

3               So to evaluate a more conservative  
4 estimate of the meromictic conditions in the -- in the  
5 pits, these -- these model inputs were also updated  
6 since submission of the DAR. And the data record was  
7 also updated from a four (4) year period to a fourteen  
8 (14) year record.

9               The -- the changes made as part of this  
10 assessment will influence water quality in Lac de Gras  
11 during operations as a result of the changes to the --  
12 the Diavik flows, as well as in Lac du Sauvage and Lac  
13 de Gras in post-closure as a result of the updates to  
14 the -- the pit lake hydrodynamic model results.

15              However, the -- the model results that  
16 have been completed as part of this update are very  
17 similar to those presented in the DAR, and on this  
18 figure here which provides TDS profiles in the Misery  
19 pit, the -- the outcomes of the -- the updated model  
20 are very similar. And that is that meromictic  
21 conditions under these more conservative assumptions  
22 will develop in the Misery pit and remain stable in the  
23 long term.

24              The -- the updated assumptions allow for  
25 more -- or result in more diffusion from the

1 monimolimnion up into the mixolimnion, so  
2 concentrations in the -- the mixolimnion do -- do  
3 increase slightly. However, the -- the monimolimnion  
4 concentrations in the Miserv pit remain the same.

5                   And just for -- just to provide some  
6 definitions here, the mixolimnion refers to the -- the  
7 upper portion of the pit lake which has lower TDS  
8 concentrations, and the monimolimnion is the bottom  
9 part of the pit that -- that has higher TDS  
10 concentrations.

11                   Looking at the results for the updated  
12 assessment case for the -- the Jav -- the Jav pit,  
13 there -- effectively there wasn't a change in the --  
14 the outcome of the model results. The updated  
15 assumptions do allow for more diffusion from the -- the  
16 monimolimnion into the mixolimnion resulting in a  
17 deeper freshwater cap. However, the model indicates  
18 that the freshwater cap will be deeper, and -- but  
19 meromictic conditions will occur and also remain stable  
20 in the long term.

21                   To -- to provide additional context to  
22 the -- the developer's assessment results and the  
23 conservatism that was carried forward as part of that  
24 assessment, a reasonable estimate water quality model  
25 was done.

1                   The -- the key changes as part of this  
2 update were really centred around the hydrogeological  
3 inputs which Don presented this morning. So there was  
4 reduced conservatism in the -- the hydrogeological  
5 model inputs, which resulted in a -- a reduced flow to  
6 the -- the Jav pit during operations.

7                   What we've learned as part of all the --  
8 the modelling scenarios we did as part of the  
9 Developer's Assessment Report and sub -- subsequent  
10 updates is that the -- the key control on discharge  
11 water quality during operations from the Miserv pit is  
12 from the -- the groundwater inflows that report to the  
13 Jav pit during operations and are subsequently pumped  
14 over to the -- the Miserv pit, since this accounts for  
15 about 65 percent of the -- the total water that  
16 requires management during the -- the life of the mine.

17                   So as a result of the reduction in the -  
18 - the groundwater inflows to the -- the Jav pit during  
19 operations, when this is carried forward into the site  
20 water quality model, a reduction in the -- the  
21 discharge concentrations from the -- the Miserv pit is  
22 also seen.

23                   And on this figure, the -- this is --  
24 these are chloride concentrations which is correlated  
25 to TDS. It accounts for about 60 percent of the -- the

1 TDS in the -- the groundwater.

2                   So under the reasonable estimate case,  
3 chloride concentrations decrease from an under-ice  
4 projected maximum at the end of mine life from around  
5 1,600 milligrams per litre to a more expected value of  
6 just over 600 milligrams per litre.

7                   And another important point to note as  
8 part of the -- the reasonable estimate water quality  
9 modelling is that the -- the storage of the -- the Jay  
10 pit, there's less flows being pumped over to -- sorry,  
11 to the Miserv pit. Less water is being pumped to the  
12 Miserv pit, which allows for a delay to the discharge  
13 from the Miserv pit to Lac du Sauvage of approximately  
14 one (1) year.

15                   At closure, the -- as Fiona mentioned,  
16 the -- the upper layer of Miserv pit is pumped to the -  
17 - the bottom of Jay pit. So we -- we updated our  
18 hydrodynamic models for -- for the -- the reasonable  
19 estimate case, which will have lower TDS concentrations  
20 since the -- the meromixis is really the -- the  
21 likelihood of meromixis occurring is related to the  
22 densities of the different water. And the TDS  
23 concentrations will decrease as a result of the -- as -  
24 - as a result of the assumptions used in the -- the  
25 reasonable estimate -- estimate scenario.



1                   So on this figure, I plotted the -- the  
2 reasonable estimate scenario compared to the -- the  
3 updated assessment results, or updated DAR results.  
4 And the -- the conclusions are -- are similar to the  
5 DAR in that meromictic conditions are going to form  
6 even under the -- the reasonable estimate scenario,  
7 providing confidence that the -- the Water Management  
8 Plan will result in meromictic conditions in the Miserv  
9 pit.

10                   The depth to the -- the pycnocline, or  
11 the boundary between the upper layer of the pit and the  
12 lower layer of the pit, is roughly the same. However,  
13 concentrations in the -- the lower portion of the pit  
14 are lower in this scenario as a result of the -- the  
15 reduced groundwater inflows.

16                   In the Jav pit, similarly, the -- as I  
17 mentioned, the Miserv pit upper layer, the upper 50  
18 metres, is pumped to the bottom of the Jav pit at  
19 closure. As a result of these reduced inflows,  
20 operational inflows to the -- the Jav pit, the  
21 concentrations in the monimolimnion as part of the --  
22 the reasonable estimate water quality modelling  
23 scenario are lower in comparison to the -- the updated  
24 assessment results that are provided in this figure as  
25 dashed lines.

1                   However, the -- the hydrodynamic models  
2 that were completed indicate, even with a -- a much  
3 lower TDS concentration in the monimolimnion, the --  
4 the meromictic conditions will form and remain stable  
5 in the long term.

6                   The one (1) difference is the -- the  
7 lower TDS concentrations and the updated wind  
8 sheltering coefficients will occur -- will result in  
9 additional diffusion from the monimolimnion to the  
10 mixolimnion. But this doesn't have a material change  
11 to the -- the upper layer concentrations, but it does  
12 produce a much deeper fresh water cap, which would  
13 provide additional stability for -- to -- to maintain  
14 meromictic conditions in -- in the pit.

15                  And as I indicated, a model was  
16 completed for Desteffany Lake. The -- the key purpose  
17 of this model was to evaluate changes downstream of the  
18 outlet of Lac de Gras, between the outlet of Lac de  
19 Gras and the outlet of Desteffany Lake. So on this  
20 figure I've presented chloride concentrations to -- to  
21 show the -- the change in -- in water quality.

22                  I -- I do want to clarify that the --  
23 the changes to water quality in Lac de Gras and  
24 Desteffany are a bit exaggerated based on scale. The  
25 maximum chloride concentration on this figure is 6

1 milligrams per litre.

2                   And this model was -- it was a mass  
3 balance model that was completed in Goldsim, the same  
4 software that was used for the -- the site water  
5 quality model, and looking at the -- the natural  
6 attenuation of outlet water quality that would occur  
7 downstream. And what the model indicates is there is  
8 additional attenuation of outlet concentrations  
9 downstream of the outlet of Lac du Gras and into the  
10 Coppermine River and at the outlet of Desteffany.

11                   A key point is that the -- the -- going  
12 back even to the conservative assumptions used in the  
13 DAR, which are presented -- or the updated assessments  
14 results which are also presented on this -- or used in  
15 this assessment, the -- the key outcome of the DAR was  
16 there was no significant adverse impacts to surface  
17 water quality in Lac du Sauvage, Lac de Gras, and by  
18 extension, that can be applied to Desteffany Lake,  
19 since there aren't any other developments down --  
20 between the outlet of Lac de Gras and Desteffany Lake.

21                   On this slide, I've presented the -- the  
22 three (3) -- the three (3) model updates that have been  
23 completed, with the exception of Desteffany, to show  
24 the -- how the -- how the changes made influence water  
25 quality in Lac du Sauvage and Lac de Gras. I haven't

1 done a comparison of the updated assessment case to the  
2 DAR case in this slide. That is provided in Appendix  
3 B, which was submitted with the IRs, and that is the  
4 compendium of supplemental water quality modelling.  
5 And these are total dissolved solids concentrations for  
6 depth average, maximum depth, and surface water --  
7 water quality concentrations that are extracted from  
8 the -- the hydrodynamic models.

9           The updated assessment case results were  
10 very similar to those presented in the DAR. And that  
11 comparison is provided in the compendium. And there  
12 was numerical differences, but there -- in terms of  
13 concentrations there was no material difference in the  
14 -- in the updated assessment case in -- in both of  
15 those lakes.

16           As expected for the -- the reasonable  
17 estimate case, the discharge concentrations are lower  
18 so you see a much lower concentrations in the -- in Lac  
19 du Sauvage and Lac de Gras in comparison to the -- the  
20 updated assessment case. And the no Jav development  
21 case, you -- you don't see a change to water quality in  
22 Lac du Sauvage. However, there -- there's still an  
23 increase in -- in Lac de Gras and this is as a result  
24 of existing operations within the -- within that  
25 watershed. I'm going to pass it off to John Faithful

1 now to talk about key IRs related to water quality.

2 MS. SACHI DE SOUZA: Sorry. Can we  
3 just take one (1) second there? We are having some  
4 teleconference problems, so can everyone who is on the  
5 teleconference line please hang up and dial back in?

6

7 (BRIEF PAUSE)

8

9 THE FACILITATOR: It's Bill Klassen.  
10 We seem to have experienced some technological  
11 difficulty with the conference line and the -- the  
12 WebEx, and now we're having difficulty contacting the  
13 people who were on the teleconference.

14 So as not to delay this unnecessarily,  
15 what I'm going to suggest is that we finish with the  
16 presentation, and then we'll break early for lunch and  
17 come back early from lunch so we can then get into the  
18 discussion rather than just have a -- a short period of  
19 discussion at -- following the presentation.

20 So if you could continue with the  
21 presentation and complete it, and then we'll break for  
22 lunch? Thank you.

23 MR. JOHN FAITHFUL: Thanks, Bill. It's  
24 John Faithful, from Golder Associates. So I've got a  
25 couple of slides to -- to finish off the presentation

1 that are going to focus on a -- a couple of the IR  
2 themes that -- that we received for water quality.

3                   The first slide here is discussing  
4 phosphorus. There's a number of the IRs that spoke to  
5 the concern of modelled increases in phosphorus in the  
6 receiving environment, especially Lac du Sauvage.  
7 Dominion characterized existing traffic status of Lac  
8 du Sauvage as oligotrophic for the reference condition  
9 based on measured total phosphorus concentrations.

10                   From the measured spatial and temporal  
11 variability that we saw, the trophic status was also  
12 shown to extend into the mesotrophic range. This  
13 characterization is based on the total phosphorus  
14 trigger ranges provided by the Canadian Council of  
15 Ministers of the Environment 2004 Phosphorus Guidance  
16 Framework document.

17                   The water mod -- quality modelling that  
18 -- all the modelling that went into the water quality  
19 modelling that it covered off Don's hydrogeology,  
20 Nathan's hydrology, and Mike's water quality modelling  
21 projects a during operational minewater discharge from  
22 Misery Pit to Lac du Sauvage. Total phosphorus  
23 concentrations in Lac du Sauvage are anticipated to  
24 increase for several years in the latter period of  
25 discharge to mesotrophic conditions, particularly

1 during under-ice conditions before returning to  
2 background concentrations following completion of the  
3 project.

4                   The Developer's Assessment Report, which  
5 I'll refer to as the DAR, concluded that this change  
6 would not lead to increased risk of adverse  
7 environmental effects. It found that the water column  
8 would remain sufficiently oxygenated -- would remain  
9 sufficiently oxygenated during under-ice conditions  
10 throughout Lac du Sauvage.

11                   Plankton and benthic invertebrates  
12 biomass may increase as a result of the increased  
13 nutrients, but clear shifts in the community  
14 assemblages of the oligotrophic organisms would be  
15 unlikely.

16                   As a result of the increased food base  
17 in Lac du Sauvage, due to the nutrient increases and  
18 increased productivity, there may be a increase -- major  
19 -- a minor increase in growth and reproduction rates in  
20 the fish valued components.

21                   The key piece in the DAR modelling  
22 regarding total phosphorus projections is a  
23 conservatism around the phosphorus source term input to  
24 the geochemical -- to the hydrogeological water quality  
25 monitoring. The prime resource of phosphorus is -- is

1 groundwater flowing towards the Jav pit and  
2 subsequently pumped to the Miserv pit.

3                   The source term is conservative. In our  
4 opinion, it's one (1) of the constituents with  
5 potentially the highest level of conservatism. The  
6 phosphorus concentration assigned to groundwater for  
7 the modelling was defined from measured concentrations  
8 of groundwater inflows to the Diavik pits and the --  
9 and the site-specific Westbay data from within the Jav  
10 ore body.

11                   Pitting flow data are available from  
12 Ekati, but rather than total phosphorus concentrations  
13 measured in the sump water, the focus is on dissolved  
14 phosphorus. So therefore, this data was not included.

15                   The source phosphorus concentration used  
16 for groundwater in the modelling is the median  
17 concentration of the Diavik and the Jav data. This  
18 input concentration is .4 milligrams per litre or -- or  
19 400 micrograms per litre. For some context, the Jav  
20 Westbay total phosphorus data ranges from -- from about  
21 20 to 60 micrograms per litre.

22                   Also the Ekati dissolved phosphorus  
23 concentration ranges from -- from below detection to  
24 about 100 micrograms per litre. But these values are -  
25 - are well below the -- the median value that was



1 carried forward into the modelling.

2                   We know from the hydro -- the  
3 hydrogeology modelling that total phosphorus is not  
4 necessarily correlated to TDS, and this seems to be  
5 supported by the Diavik and Ekati data. That means the  
6 total phosphorus concentrations don't necessarily  
7 increase with depth. Therefore, we can assume from  
8 that, based on the Jav-Westbay data, that total  
9 phosphorus concentrations that have been recovered to  
10 date may remain as measured with the Jav pit  
11 development.

12                   Additionally, as Don indicated this  
13 morning, there's conservatism around the projected  
14 groundwater inflow volumes to Jav pit. So the total  
15 phosphorus load to the Misery pit is also likely to be  
16 overestimated. Dominion believes the projected  
17 groundwater total phosphorus concentrations are likely  
18 higher than reasonably expected, so we're confident  
19 that we have overestimated the phosphorus  
20 concentrations in Lac du Sauvage.

21                   Once Jav pit development commences and  
22 the groundwater inflows to Jav pit are monitored,  
23 Dominion should have an initial understanding of what  
24 to expect for groundwater total phosphorus  
25 concentrations. So for the purpose of the EA, as has -

1 - as has been mentioned on numerous occasions today,  
2 the -- they're carrying the conservative case through  
3 to -- to an EA case to -- to ensure that there isn't an  
4 underestimation of potential effects, and we think  
5 we've done that quite successfully with regards to --  
6 to total phosphorus.

7                   Next slide, Mike, please? Another IR  
8 was on significance, and I thought I'd take the  
9 opportunity to -- to point out a few -- to -- to make a  
10 few points on -- on this particular issue. For this  
11 key line of inquiry, the terms of reference identified  
12 hydrogeology, hydrology, and water quality as valued  
13 components.

14                   Our assessment in this section focused  
15 on measurement indicators which represent properties of  
16 the environment and valued components, such as  
17 constituent water chemistry that, when changed, could  
18 result in or contribute to an effect to the assessment  
19 endpoint.

20                   For this section of the Developer's  
21 Assessment Report, the assessment endpoint is defined  
22 as the suitability of surface water to support or  
23 maintain healthy and sustainable aquatic and  
24 terrestrial ecosystems, and the ability to use the  
25 water by wildlife and humans.

1                   It's a very integrated assessment  
2 approach that characterizes all of the -- all of the  
3 potential influences on surface water quality as a  
4 result of project activities, which include  
5 hydrogeology, hydrogeo -- hydrology, and -- and the  
6 surface water quality elements.

7                   The approach used in the Developer's  
8 Assessment Report was to assess the effect project  
9 activities may have on the elements of water quality,  
10 and to components of the receiving environment that are  
11 to be protected so that a determination of potential  
12 risk to aquatic life or use as a result of the project  
13 could be evaluated.

14                   This was done through evaluating the  
15 changes to water quality by comparing them to baseline  
16 conditions, water quality guidelines and objectives,  
17 and aquatic health thresholds and benchmarks. This  
18 approach is consistent with other EA aquatic  
19 assessments conducted in the North.

20                   Comprehensive quantitative water quality  
21 models were developed as -- as you've heard already  
22 this morning, and used to project these changes to  
23 groundwater hydrology and water quality as result of  
24 the project activities. These models have used  
25 conservative assumptions to make sure that the changes

1 or effects would not be underestimated.

2 Water quality and its influence on the  
3 receiving environment in Lac du Sauvage and Lac de Gras  
4 were projected based on site-wide interactions of all  
5 of the various models and -- and components that have  
6 been described by -- by Mike, Don, and -- and Nathan,  
7 as well as other project influences and other mining  
8 operations over the life of the project and beyond  
9 within this watershed.

10 The assessment focusses on a series of  
11 questions that link the project to the assessment  
12 endpoint. These include: What are the key project  
13 activities that may affect the receiving environment?  
14 That's outlined in the pathway analysis within the --  
15 in Section 8. What happens to the receiving envir --  
16 envi -- environment as a result of project activities?  
17 That carries forward into the residual effect  
18 assessment.

19 What are the effects of the water  
20 quality changes to the environment in terms of the  
21 measurement indicators? What do changes in these  
22 measurement indicators mean to the assessment endpoint?  
23 And what level of change to the measurement indicators  
24 would make a -- a significant impact?

25 The model water quality results were

1 compared to -- to aquatic life guidelines, drinking  
2 water guidelines, aquatic health effects benchmarks.  
3 These -- these guidelines and benchmarks are based on  
4 scientific, defensible data that are used to determine  
5 the potential risk to water quality, change to aquatic  
6 life, and the use by wildlife and humans. It's a well-  
7 considered approach which also guides mitigation that's  
8 built back into the -- into the mine plan.

9                   Next slide, Mike. The effects study  
10 area. So the effects study area for this -- for -- for  
11 water quality is the area within the baseline study  
12 area where project activities could potentially have  
13 direct or cumulative effects to the assessment  
14 endpoint.

15                   The effects study area for water quality  
16 was defined to the extent where measurable effects were  
17 anticipated to occur. For the purposes of the  
18 assessment, this area was set as the outlet of Lac de  
19 Gras. The quantitative hydrodynamic models developed  
20 for the DAR included Lac du Sauvage and Lac de Gras,  
21 and that's been outlined by -- by Mike. The DAR  
22 assessment for water quality suggests that during the  
23 life of the project, small changes to water quality may  
24 extend beyond the Lac de Gras outlet and potentially  
25 into -- into Desteffan Lake.

1                   As you've heard from Mike and -- and  
2 others this morning, this modelling is built around  
3 conservative assumptions which are directed towards  
4 overestimating water quality constituent concentrations  
5 in the receive -- receiving environment beyond that  
6 which may realistically occur of the life of the  
7 project.

8                   The supplemental models that -- that  
9 Mike has described just previously put some context  
10 into these model water quality concentrations for  
11 predicted water quality. And it took a semi-  
12 quantitative downstream model through Coppermine to the  
13 mouth of -- to the outlet of Desteffany Lake to  
14 determine the potential for change in the Coppermine  
15 River as a result of the assessment conclusions for Lac  
16 de Gras.

17                   There was a reasonable estimate case  
18 that -- that was built upon less conservative water  
19 quality assumptions in input to -- to provide a -- a  
20 more expected case around what the -- the project  
21 effects might likely be, and another Jay case model to  
22 project water quality in Lac du Sauvage and Lac de Gras  
23 over the Developer's Assessment Report time frame  
24 without the project case.

25                   The first two (2) models determined that

1 small water quality changes could be possible  
2 downstream of Lac de Gras, but as concluded in the DAR,  
3 concentrations are projected to be less than -- than  
4 those predicted at the outlet of -- of Lac de Gras.  
5 And the last model showed that project effects fall  
6 within in the range of predicted changes under the no  
7 Jav case in Lac de Gras prior to the project influence.  
8 What the project does when it's superimposed upon this  
9 no Jav case is extend these changes bef -- before  
10 constituents return to background levels. So there's  
11 an increase in duration of -- of effects to Lac de  
12 Gras.

13                   Throughout the Developer's Assessment  
14 Report, the potential magnitude of change at the outlet  
15 of Lac de Gras was discussed and evaluated relative to  
16 the measurement indicators and screening values, both  
17 of which take into account aquatic life, wildlife, and  
18 human end users. The magnitude of predicted changes in  
19 Lac de Gras were shown to be sufficient to result --  
20 not -- were shown to not be sufficient enough to -- to  
21 result in any risk to significant adverse effects.  
22 Thus, any downstream trends -- any downstream changes  
23 in Lac de Gras, if measurable, would not cause --  
24 sorry. Thus, any changes downstream of Lac de Gras, if  
25 measurable, would not cause a significant adverse

1 effect.

2 In summary, the DAR was completed by  
3 using -- by assessing the potential effects to water  
4 quality and took into consideration the magnitude of  
5 change and the geographical extent of change where  
6 project activities could potentially have direct and  
7 cumulative effects to the assessment end point.

8 Thanks.

9 MR. RICHARD BARGERY: Richard Bargery,  
10 Dia -- Dominion Diamond. That's -- that's the -- the  
11 presentations, Bill, so.

12 THE FACILITATOR: Thank you. It's Bill  
13 Klassen. And it's approximately twenty (20) minutes to  
14 12:00. As I said a little while ago, rather than begin  
15 the -- the discussion now, I suggest that we break for  
16 lunch, come back at twenty (20) to 1:00, and then we'll  
17 get underway with the discussions. And my apologies to  
18 those who were on the conference line. We lost the  
19 connection, but we'll be back with you at twenty (20)  
20 to 1:00 Mountain Daylight Time. Thank you.

21

22 --- Upon recessing at 11:38 a.m.

23 --- Upon resuming at 12:45 p.m.

24

25 THE FACILITATOR: Good afternoon,



1 everyone. My name is Bill Klassen, and I'll be  
2 facilitating the session. I understand that the people  
3 who joined us by teleconference are back, so I wonder  
4 whether you could tell me again who you are, and where  
5 you are, and your affiliation? I'm just -- I'm asking  
6 that just to make sure that we do indeed have you back  
7 online with us.

8 MS. ANNE WILSON (BY PHONE): Hi. It's  
9 Anne Wilson, with Environment Canada.

10 THE FACILITATOR: Thank you. Anyone  
11 else?

12 MR. IGNACIO DUQUE (BY PHONE): Ignacio  
13 Duque, with Transport Canada.

14 THE FACILITATOR: Thank you. Is there  
15 anyone else on the telephone?

16

17 (BRIEF PAUSE)

18

19 THE FACILITATOR: Okay. Thank you.  
20 And thank you all for coming back early. We'll --  
21 we'll get underway. Just before lunch we had a  
22 presentation from the Developer on hydrology. And so  
23 this afternoon we'll be focussing the discussion on  
24 that topic.

25 And in order to -- well, as -- as

1 everyone understands, I'm sure, the purpose of these  
2 sessions is to resolve what may be outstanding matters  
3 related to the Information Requests and the responses.

4               So as much as possible, the information  
5 that we're trying to elicit from Dominion Diamond is to  
6 assist the Board in -- in making their assessment. So  
7 I would ask those who will be asking questions to  
8 provide us with a bit of context before you ask your  
9 question, what -- what is the --the main purpose in  
10 asking the question. If it's for clarification of  
11 details, hopefully it will be for clarification of  
12 details, it would assist the Board in making their  
13 assessment.

14               So with -- with that as context for the  
15 discussion then, let me just check with Sachi to see  
16 whether there's any further context that she wants to  
17 provide.

18

19 QUESTION PERIOD:

20               MS. SACHI DE SOUZA: I do, I do. So  
21 for this afternoon we're going to walk through  
22 hydrology and site water management. So the first  
23 portion we would like to focus just on the sort of  
24 regional hydro -- hydrologic models. And the questions  
25 that were in there were primarily related to the model

1 designs and -- design, and the questions about the  
2 effect of wet and dry years in the inclusion of A21,  
3 which was discussed in the presentation.

4                   After the base and wide hydrology, we'll  
5 move into site water management. And we'll start off  
6 with a conversation about the waste rock storage area,  
7 and any questions about the waste rock storage area.  
8 And then move into the overall management in terms of  
9 capacity, safety factors, contingency planning, the  
10 actual site water balance model itself, and water  
11 quality predictions that are going into the environment  
12 as a result of the mine operation.

13                   From there, we'll move into closure  
14 predictions and possible effects from closure. And  
15 then we'll end off with a discussion on the assessment  
16 endpoints and thresholds for significance -- of  
17 significance.

18                   THE FACILITATOR: Thank you, Sachi.  
19 It's Bill Klassen. So we'll begin as -- as we did  
20 before, or we did this morning, with questions from  
21 parties in the room. And then I'll ask whether there  
22 are any questions from the folks who've joined us by  
23 teleconference, and then questions that may be coming  
24 from Board staff or Board advisors.

25                   I -- I will of course provide

1 opportunity for Board advisors with their expertise to  
2 join the discussion when their comments may help  
3 provide some clarity.

4                   So are there questions then from parties  
5 in the -- in the room on the -- I believe you said  
6 waste rock storage area first. Yes, and hydrology.

7                   MR. NEIL VAN DER GUGTEN: Neil van der  
8 Gugten, for the GNWT. My first question: Now, just a  
9 clarification. When I refer to IRs, there's the  
10 original IR number, and then the response number which  
11 is about two (2) points less than that.

12                   So which one do you want me to use?

13                   THE FACILITATOR: Perhaps Sachi can  
14 provide clarification on that.

15                   MS. SACHI DE SOUZA: Yeah. We -- we  
16 appreciate the number of numbers. So the IR number.  
17 So if it's GNWT-6, which is two (2) less, that's the  
18 one to be using, the bolded number on that table.

19                   MR. NEIL VAN DER GUGTEN: Okay. So  
20 with respect to IR-28, it had to do with the overall  
21 hydrologic model. And it's a very complex model. It's  
22 very detailed. It takes account of a lot of the  
23 different hydrologic components that go into computing  
24 runoff.

25                   There's very little data available, so a

1 lot of -- a lot of parameters had to be estimated. And  
2 some of the model parameters, when you look at the  
3 literature, do not appear to be very realistic and/or  
4 they are subject to large errors.

5                   And my question has to do with the fact  
6 that there really is no quantified estimate of the  
7 accuracy of the error limits of the model results.  
8 There is quantitative descriptions that are -- yes, the  
9 results are acceptable, they're good, they conform.  
10 But there's no actual number that gives us a feeling,  
11 other than the subjective estimate of the Developer,  
12 what -- how good the model has performed.

13                   So for example, there are a couple of  
14 graphs showing hydrographs for a couple of the lakes  
15 for which we do have data. There's Lake E10, Ursula  
16 Lake, and Lake D3, Counts Lake. The plots are  
17 presented in a very compressed fashion. It's very  
18 difficult to actually compare the observed data with  
19 the modelled results.

20                   It appears to me that the modelled peaks  
21 are on the order of three (3) to six (6) times higher  
22 than what has been observed. And my question is: I --  
23 we would request the Developer to apply some kind of  
24 objective, quantitative evaluation of the model  
25 reliability.

1                   Such approaches are available in the  
2 technical literature. For example, there's a paper  
3 called "Model Evaluation Guidelines for Systematic  
4 Quantification of Accuracy in Watershed Simulations."

5                   And my request is: Why was such a -- an  
6 approach not provided so that those who have to  
7 evaluate the results are able to have some quantitative  
8 evaluation of the reliability of the hydrologic  
9 modelling? Thank you.

10

11                   (BRIEF PAUSE)

12

13                   MR. NATHAN SCHMIDT: Nathan Schmidt,  
14 with Golder Associates. Thank you for your comments  
15 and the -- the paper that you did provide to us or, you  
16 know, referenced. We -- we pulled a copy of that and  
17 have reviewed it. It's got some -- some good guidance  
18 in it. Now, one (1) of the -- I'd like to provide a  
19 little bit of background on the model and why we chose  
20 this approach.

21                   And for the people who haven't been here  
22 since kind of the very beginning back when it was Jav-  
23 Cardinal instead of just Jav, there might not be an  
24 understanding of the reason we needed kind of more  
25 detailed information for those tributaries to Lac du

1 Sauvage and the reason we -- we chose this approach.

2                   The first part of the project, you know,  
3 we were -- we compiled a baseline, and we used that  
4 information as part of alternative evaluation for a  
5 project that has now evolved to something that is quite  
6 a bit less -- a -- a lower disturbance to the  
7 environment. The -- the initial project had, you know,  
8 potential large stream diversions. It had dikes that,  
9 you know, sequestered a significant portion of Lac du  
10 Sauvage, that sort of thing. So there was a need to,  
11 you know, look a lot closer at those tributaries to Lac  
12 du Sauvage.

13                   And so that kind of carried through.  
14 When the project was scaled back to just the Jay  
15 project, now the focus is -- is much more just on Lac  
16 du Sauvage, on Lac de Gras, and on some of the smaller  
17 direct tributaries that are really associated with the  
18 project footprint. The selection of that approach  
19 where we looked at the -- the precipitation and the  
20 runoff, and we used the runoff coefficients, like you  
21 said, it is fairly complex. But, you know, we believe  
22 it was warranted for that, and I believe in the Lac du  
23 Sauvage watershed, you know, it is -- it is still  
24 warranted.

25                   Now, the -- the paper that you provided

1 has a -- a quote that kind of struck me. It says:

2 "According to Refsgaard 1997, model  
3 validation is the process of  
4 demonstrating that a given site-  
5 specific model is capable of making  
6 sufficiently accurate simulations,  
7 although sufficiently accurate can  
8 vary based on project goals."

9 And I think the important things that  
10 we're looking at with regards to this assessment are  
11 the inputs that we're providing to the water quality.  
12 And in this -- you know, because of the storage in Lac  
13 du Sauvage and in Lac de Gras, the annual water yields  
14 to those water bodies are by far the most important  
15 thing that we're looking at with regards to water  
16 quality. And we have calibrated to the water yield  
17 from the long-term water survey of Canada station at  
18 Desteffany Lake outlet.

19 So we have quite a high level of  
20 confidence in that. And it's that water yield, when we  
21 take it back up the line, where we get those runoff  
22 coefficients for the land areas. Okay.

23 So, you know, in that I can -- I can  
24 speak with -- with quite a high level of confidence.  
25 The -- the hydrographs that were provided in that



1 validation section are intended as a qualitative, sort  
2 of provide a little bit of comfort, you know, that we  
3 weren't way out of the ballpark.

4 We prefaced that section, and I'm going  
5 to -- I'm going to read from Section F.2 -- F2 of the  
6 baseline -- the hydrology baseline. And it says:

7 "The water balance model continue --  
8 considers physical characteristics of  
9 the basins and derived long-term  
10 meteorology for the hydrology  
11 baseline study area. The baseline  
12 meteorology is intended to represent  
13 the long-term mean and variability at  
14 the project."

15 Okay. So, you know, part of the terms  
16 of reference of this project were we weren't just going  
17 to rely on means. We were going to look at wet and dry  
18 conditions. And so in using that long-term  
19 meteorological data set, that's how putting it through  
20 this model, we get the variability in the hydrological  
21 response.

22 The quote carries on, and it says:

23 "But it is not intended to represent  
24 contit -- conditions at specific  
25 locations on specific dates. For

1 example, a rainstorm that may have  
2 occurred in the Lac du Sauvage basin  
3 in the summer of a specific year may  
4 not be present in that baseline  
5 meteorological series, because it's  
6 based on other locations."

7 There's spatial variability there. But  
8 because we're dealing with the long-term data set, what  
9 we expect is the statistics that come out will  
10 adequately represent what's going on.

11 Similarly, differences in site-specific  
12 snow pack and temperature are expected to be present in  
13 any given year. However, over the long term, mean and  
14 extreme rainfall characteristics at that location  
15 should be represented. It says:

16 "For this reason, measured and  
17 modelled hydrographs at specific  
18 locations are not expected to match  
19 precisely. However, the hydrological  
20 statistics at specific locations are  
21 expected to be adequately represented  
22 by the water balance model. It's  
23 recognized that future monitoring  
24 efforts should focus on the further  
25 validation and, if necessary,

1                   recalibration of the water balance  
2                   model."

3                   Okav. So, you know, we have included  
4 those -- those hydrograph for comparison, but that was  
5 just a qualitative thing. There was no intent in  
6 demonstrating that they match exactly or precisely.

7                   MR. NEIL VAN DER GUGTEN: Neil van der  
8 Gugten. Yeah, I understand that it's futile to try to  
9 match -- match things precisely. But a difference of  
10 three (3) to six (6) times in the peak is not very  
11 good, in my opinion. And, fine, you're using the  
12 annual yield as a basic parameter to calibrate your  
13 model. I didn't actually find the calibration data  
14 that does that.

15                   I mean, maybe it is there somewhere, but  
16 I couldn't find it. So if you can locate that for me,  
17 that -- I would appreciate that. And at the end of the  
18 day, whatever you are using as your prime parameters,  
19 why could you not use that prime parameter or some  
20 similar parameters and put that into this objective  
21 evaluation of simulation to see how good your model is?  
22 Because right now, from what I've seen, it doesn't seem  
23 as good as you claim it is.

24                   So I -- I remain to be convinced.

25

1 (BRIEF PAUSE)

2

3 MR. NATHAN SCHMIDT: Nathan Schmidt,  
4 with Golder Associates. I'd like to comment on the --  
5 the peaks that you mentioned there first. And for the  
6 Ursula Lake, the E10 outlet, indeed, there is something  
7 that shows up there that -- there -- there's a  
8 difference.

9 And one (1) thing we know about the --  
10 the streams in the north is that the conditions at the  
11 outlets, at the lake outlets during melt, melt tends to  
12 happen pretty fast. And if we have melt that occurs  
13 before the lake outlets open up, we can get rapid rises  
14 in -- in lake water surface elevation and we can get  
15 our -- our peak flows happening there.

16 So at that particular location it is  
17 possible that it's not completely accurately  
18 representing that. I will note though that that is a  
19 lake in the upper watershed. It's, you know, quite a  
20 distance upstream of Lac du Sauvage. And what's going  
21 to happen is any, you know, discrepancy like that as  
22 that water moves downstream what we're going to get is  
23 storage and attenuation, and we're going to see less  
24 and less of that effect the further we move downstream.  
25 So it will be muted -- very muted by the time we get to

1 -- to Lac du Sauvage.

2                   The other comment on that is for Lake  
3 D3, the -- the Counts Lake outlet. One (1) of the  
4 issues that occurs with this -- with measuring these  
5 things early in the season is quite often it's -- it's  
6 difficult to get in there and actually monitor that  
7 accurately.

8                   If you're trying to do continuous  
9 monitoring under ice conditions, and monitor that  
10 complex interaction between ice melt and snow melt  
11 runoff and -- and flow out of the lakes, unless you  
12 actually have somebody stationed at that lake twenty-  
13 four (24) hours a day, the monitoring isn't necessarily  
14 going to capture that.

15                   And, in fact, the data that we used --  
16 the historical data that we used oftentimes missed the  
17 peak. The commencement of the monitoring season was  
18 after the peak had already occurred. And so that's one  
19 (1) of the reasons for the -- the Counts Lake D3 outlet  
20 that, you know, the peaks might not seem to -- to be  
21 captured. Like we -- we see them in the modelling but  
22 we don't necessarily see them in the -- in the  
23 monitoring data.

24                   That said, speaking of the validation  
25 here, the data that we really need to -- to validate,

1 the most relevant data set, we need a long-term data  
2 set to match our -- our long-term simulation. And what  
3 I'm going to suggest is that the most appropriate  
4 location for doing that is at the Desteffany Lake  
5 outlet with the -- the hydrograph at the Desteffany  
6 Lake outlet. It's been monitored since 1994. There  
7 are some gaps in the record there but we do have, you  
8 know, at least fifteen (15) years of, you know, full  
9 year of data there.

10 We used that location for calibration of  
11 water yield only. We did not use it for calibrating  
12 any hydrographs. And so it would be appropriate to use  
13 that data set for validation, and we're prepared to do  
14 that. And I'm going to state though that because we  
15 are using our derived long-term meteorological data set  
16 compared to the shorter term site-specific data set at  
17 the Desteffany Lake outlet, we're not going to expect a  
18 perfect match.

19 But I believe, you know, based on what  
20 we've seen qualitatively from the hydrographs that, you  
21 know, we'll come up with something following the -- the  
22 methods in the Moriasi et al paper that should be  
23 favourable.

24 MR. NEIL VAN DER GUGTEN: Neil van der  
25 Gugten. So are you going to go year by year for each

1 year of data that you have for Desteffanv Lake? I  
2 mean, you have so many years of data there. You have -  
3 - you'll have hydrographs for the discharge there, and  
4 you can simulate the hydrographs because you're doing  
5 day by day simulations.

6 So you should be able to produce  
7 modelled hydrographs for Desteffanv Lake and compare  
8 them to the observed hydrographs, is that right?

9

10 (BRIEF PAUSE)

11

12 MR. NATHAN SCHMIDT: Nathan Schmidt,  
13 with Golder Associates. That's correct. We will use  
14 the -- the available historical period of record from  
15 Desteffanv Lake, and compare it to our model.

16 MR. NEIL VAN DER GUGTEN: Neil van der  
17 Gugten. You also have some data for Lac de Gras water  
18 levels and discharges that's a little bit closer to the  
19 site that would also improve the confidence of the  
20 model for the actual site area, Lac du Sauvage and Lac  
21 de Gras.

22 Can you do the same approach with your  
23 model and the data for Lac de Gras water levels and  
24 discharges?

25

1 (BRIEF PAUSE)

2

3 MR. NATHAN SCHMIDT: Nathan Schmidt,  
4 with Golder Associates. The -- the data that we have  
5 available for Lac de Gras is -- is much shorter term.  
6 It's also seasonal. It doesn't have the -- like --  
7 like I said in the presentation, this is actually the  
8 first year where we have monitoring over winter there.

9 The data, you know, that we have in the  
10 baseline was all collected well before Jav, and for  
11 different intentions. And so I don't believe that it  
12 would be appropriate, given the short-term nature of it  
13 and the -- the gaps in the record, to use that for  
14 validation.

15 MR. NEIL VAN DER GUGTEN: Neil van der  
16 Gugten. But there's like three (3) or four (4) years  
17 of open-water season data. You'd only be expected to  
18 compare the model to the periods where you have data  
19 for. I don't see that the gaps in the record or the  
20 shortness of record would change your ability to  
21 compare model to the data.

22 MR. NATHAN SCHMIDT: Nathan Schmidt,  
23 with Golder. As I said before, our -- our model is  
24 based on a derived meteorological period of record.  
25 And the conditions in any given year for that model do



1 not necessarily correspond to the conditions that would  
2 have been experienced in that same year in the Lac de  
3 Gras watershed.

4                   And so, over the longer term, you know,  
5 that tends to be perhaps a little more muted, a little  
6 less of a -- especially if we're considering something  
7 like exceedance curves. You know, if we have a long-  
8 term period of record, we can get a little bit of value  
9 out of that. But over a short term, I -- I don't  
10 believe that's appropriate.

11                   MS. SACHI DE SOUZA:    Okay. So I'm just  
12 going to interject here for a second. First of all,  
13 for Lac de Gras, what years do you have climate data  
14 for, and what years do you have outlet discharge rates  
15 for, or measured -- measured water levels of discharge  
16 rates from the Lac de Gras outlet?

17                   MR. RICHARD BARGERY:    Richard Bargery,  
18 Dominion Diamond. Just a second, for those on the  
19 phone.

20

21   (BRIEF PAUSE)

22

23                   MR. NATHAN SCHMIDT:    Nathan Schmidt,  
24 with Golder. For the Lac de Gras outlet, we have some  
25 seasonal data in 1995/1996 that's continuous over

1 several months of open-water season. For 1997, we only  
2 have some -- some manual -- four (4) manual single-  
3 point measurements that, you know, they don't provide a  
4 hydrograph. So I would say parts of two (2) years  
5 there.

6 And then from the more recent monitoring  
7 that's occurred there, we have seasonal hydrographs in  
8 2010, 2011, and 2012.

9 MS. SACHI DE SOUZA: So I'm assuming  
10 when you're saying, "seasonal," the -- it was blocked  
11 by -- it was taken out during winter, just to confirm  
12 that?

13 MR. NATHAN SCHMIDT: Nathan Schmidt,  
14 with Golder. That's correct.

15 MS. SACHI DE SOUZA: Oh, sorry. Sachi  
16 De Souza. That's my name, with the Board. Okay. So  
17 just -- I think I'm going to be able to round this off,  
18 that what GNWT would like is a calibrated hydrologic  
19 model of the Desteffany Lake outlet calibrated to --  
20 calibrated in the hydrographs for model versus  
21 observed.

22 Is that what I'm understanding here?  
23 And, where possible, for the Lac de Gras outlet.

24 MR. NEIL VAN DER GUGTEN: Neil van der  
25 Gugten. Yes. In -- in addition to those discharges

1 mentioned by Golder, there's a continuous water level  
2 from 2008 to 2013, according to your Figure F-312.

3 MR. NATHAN SCHMIDT: Nathan Schmidt,  
4 with Golder. That's correct. In F-312, there are some  
5 water level data from the east island, the Diavik  
6 operation, only water levels, no discharges. So those,  
7 you know, while continuous, don't capture discharges.  
8 The F-311 has those three (3) years of data from 2010  
9 to 2012, that I -- that I had indicated.

10 MS. SACHI DE SOUZA: Okay. Before we  
11 drag this out, what I would suggest is, first of all,  
12 we're going to make this a undertaking, because I'm  
13 assuming it cannot be done within the technical  
14 session, to calibrate the hydrologic model at the  
15 Desteffany Lake outlet for the hydrographs, and to  
16 calibrate to the Lac de Gras outlet for the years  
17 possible. And I suggest that Dominion and GNWT confirm  
18 the years that it is possible for the Lac de Gras  
19 outlet.

20

21 (BRIEF PAUSE)

22

23 MR. NEIL VAN DER GUGTEN: May I say  
24 something? I don't know if you want to ask them to  
25 recalibrate the model, but what I want is a measure --

1 an objective measure of the validity of the model  
2 results compared to the observed data. And if they  
3 wish to recalibrate the model, that's fine too.

4

5 (BRIEF PAUSE)

6

7 MR. RICHARD BARGERY: Richard Bargery,  
8 Dominion Diamond. I -- I think what -- what Nathan was  
9 talking about -- what we're prepared to do is that  
10 validation at the Desteffany Lake outlet. Because I --  
11 I don't think we think it's valid for the -- for -- for  
12 Lac de Gras at this point, given the amount of -- given  
13 the amount of data.

14 MR. NEIL VAN DER GUGTEN: Yeah. Neil  
15 van der Gugten. And is the reason that you don't think  
16 you -- you don't want to do it for Lac de Gras because  
17 you don't think the comparison or the output of that  
18 computation is going to be valid or because it takes  
19 too much time? Because if it's not going to be valid  
20 you can -- you can still do the computation and comment  
21 that this is not applicable to what you're trying to do  
22 because of whatever reason.

23

24 (BRIEF PAUSE)

25

1 MR. RICHARD BARGERY: We can -- Richard  
2 Bargery, Dominion Diamond. We can -- we can do the  
3 validation for the Desteffanv Lake outlet by -- by, you  
4 know, in -- within the undertaking period by May 8th.  
5 But the other work, I guess from our perspective, you  
6 know, we don't think it adds value and it is going to  
7 take, you know, additional time and resources. So we  
8 question why we would -- we would question why we --  
9 why would we do that work.

10 MS. SACHI DE SOUZA: Okay. Before we  
11 close off this undertaking is there a -- a reason that  
12 GNWT feels it's important to also do the calibration  
13 for Lac de Gras? Just to close this off.

14

15 (BRIEF PAUSE)

16

17 MR. NEIL VAN DER GUGTEN: Neil van der  
18 Gugten. Well, we think it is of value to do the Lac de  
19 Gras. If you look at the water level plots, there's a  
20 couple of significant differences in the model versus  
21 the observed. But if the Board feels it's not that  
22 important, then that's up -- that's up to you.

23 MS. SACHI DE SOUZA: So -- Sachi De  
24 Souza, with the Board. I can appreciate that there are  
25 some -- some discrepancies between the modelled and

1 measured for the Lac de Gras water levels and -- and  
2 water surface elevations. I can also understand GNW --  
3 or Dominion's point that the data might be indicative  
4 of something that's not occurring if you do, do that  
5 assessment.

6                   So for right now I think we'd like to  
7 stick with the undertaking that Dominion complete a  
8 validation for the Desteffany Lake -- for the  
9 hydrologic model to Desteffany Lake and present those  
10 results within the two (2) week undertaking period.  
11 And that will give some information that might  
12 enlighten us as to whether -- further information is  
13 needed for Lac de Gras in the future.

14                   THE FACILITATOR: It's Bill Klassen.  
15 And I'm asking then if there are other questions  
16 related to this topic of hydrology?

17                   MR. NEIL VAN DER GUGTEN: Yes, Neil van  
18 der Gugten. With reference to IR-36, on stage-storage  
19 -- lake stage-storage effects, okay, I understand the  
20 vertical wall assumption that was used as a convenient  
21 way of dealing with lake storage effects, and that is  
22 reasonable.

23                   However, for the big lakes, Lac du  
24 Sauvage and Lac de Gras, it appears that you use the  
25 vertical wall also for those lakes.

1                   Is that correct?

2                   MR. NATHAN SCHMIDT:    Nathan Schmidt,  
3 with Golder. Yes, that's correct.

4                   MR. NEIL VAN DER GUGTEN:   Now -- but  
5 you have bathymetry for those lakes and you have a  
6 stage-storage curve up to the surface of the lake.  
7 It's very easy to use the slope of the stage-storage  
8 curve to compute actual stage-storage effects that are  
9 much closer to reality than a vertical wall.

10                  So if you have that data, why -- why  
11 didn't you use it?

12

13   (BRIEF PAUSE)

14

15                  MR. NATHAN SCHMIDT:    Nathan Schmidt,  
16 with Golder. The bathymetric data that gave us that  
17 stage-storage information was -- was really collected  
18 for other purposes, for engineering design, for the  
19 fisheries assessments, for the water quality, you know,  
20 looking at things like retention time sort of thing.

21                  If you look at those hydrographs, even  
22 the measured hydrographs of Lac de Gras, you can see,  
23 you know, very small fluctuations, like half a metre,  
24 essentially, which -- you know, with shorelines of the  
25 type that we're seeing here, the -- the difference in

1 those surface areas would be inconsequential. So we  
2 didn't feel the need to, you know, further complexify  
3 the model by putting something like that in.

4

5 (BRIEF PAUSE)

6

7 THE FACILITATOR: It's Bill Klassen.  
8 Are there other questions on this topic? Go ahead.

9 MR. NEIL VAN DER GUGTEN: Neil van der  
10 Gugten. With respect to IR-37, which has to do with  
11 the modelling of the tributary basins to Lac de Gras,  
12 it's -- a different approach was used. And there was  
13 an adjustment made to calibrate the overall shape of  
14 the tributary basin hydrographs to match that of the  
15 Slipper Lake, for which data was available for 2012, I  
16 believe.

17 And the information presented in the  
18 calibration, Appendix F, indicates that instead of  
19 using the Slipper Lake hydrograph, which has a peak of  
20 11 cubic metres per second, somehow the wrong  
21 hydrograph was used. It was Po -- Polar Vulture, which  
22 only has a PO of .56 cubic metres per second. And when  
23 I looked at the hydrograph for basin 9 presented as  
24 being matched to that Slipper Lake, it seemed -- the  
25 error seemed to have been propagated into that



1 hvdrograph.

2                   And so mv question is: Did vou actually  
3 use the wrong hvdrograph there for calibrating the  
4 other basin hvdrographs, and what was the consequence  
5 of that? And -- and was that error propagated, then,  
6 through the model in its outputs? Thank vou.

7                   MR. NATHAN SCHMIDT: Nathan Schmidt,  
8 with Golder. I can confirm that the error was strictly  
9 a cut and paste error. Somebody put the wrong  
10 hvdrograph in as a -- as an illustration, and nothing  
11 was propagated into the model.

12                   If we were out by that order of  
13 magnitude, our -- our water vields at the outlet of  
14 Desteffany Lake would have been verv much in error.  
15 Yeah, like divergent from the calibration. So we -- we  
16 relied on those hvdrographs to provide us with a -- a  
17 tvpical shape for that calibration, but nothing was  
18 carried through into the modelling.

19                   MR. NEIL VAN DER GUGTEN: Neil van der  
20 Gugten. So if I look at the actual hvdrograph for  
21 basin 9, Figure F-35, it shows a peak of 29 cubic  
22 metres per second, and the area of basin 9 is how much?  
23 So mv question is: How did vou take account of land  
24 and lake areas to scale up the hvdrographs, iust...

25                   MR. NATHAN SCHMIDT: Nathan Schmidt,

1 with Golder. The -- the lumped approach that we used  
2 for the -- the downstream, the Lac de Gras basin, we  
3 chose that approach. We had put a lot more detailed,  
4 you know, baseline effort into the Lac du Sauvage basin  
5 for the reasons I -- I discussed before.

6                   When we get into the Lac de Gras basin,  
7 the -- the really important things that we're -- we're  
8 worried about, like I also said before, are the water  
9 yields, the annual water yields because, you know,  
10 that's driving. It's a -- it's an important input into  
11 the -- on the water quality modelling. So we used, you  
12 know, not as -- as complex approach as, you know, we --  
13 we chose to do for the Lac du Sauvage basin.

14                   To get back to your question, how we  
15 defined the runoff from the land surfaces and -- and  
16 the lake surfaces, we used the same water yields for  
17 the same years as we had already derived for the Lac du  
18 Sauvage basin. So it's -- it's, you know, consistent  
19 with that. And that's the basis for our -- for our  
20 calculations.

21                   MR. NATHEN RICHEA: Thank you. It's  
22 Nathen Richea, Water Resources, ENR. I just have a  
23 follow-up question. So the cut -- the cut and paste  
24 error that was done, was it cut and paste -- the wrong  
25 hydrograph was cut and paste, or was it the wrong peak

1 discharge cut and paste? Where -- where was the error  
2 that may have been made?

3 MR. NATHAN SCHMIDT: Nathan Schmidt,  
4 with Golder. And -- and I think one of the drivers for  
5 the -- the cut and paste mistake is that the shape of  
6 those hydrographs is the same. It's just the numbers  
7 on the Y-axis are different, which is what Mr. van der  
8 Gueten picked up on.

9 Sorry, I forget the actual question.

10 MR. NATHAN RICHA: Thank you. It's  
11 Nathan Richa here. Yeah. I was just wondering if the  
12 cut and paste was just an error with the hydrograph  
13 itself. I guess it sounds like that might have been  
14 the issue, rather than the cut and paste on the peak  
15 discharge that might have been in text. I was just  
16 wondering where the error might have been.

17 MR. NATHAN SCHMIDT: Yeah. Nathan  
18 Schmidt, with Golder. Yeah, it was a cut and paste of  
19 a -- of a figure that came out of a prior AEMP.

20

21 (BRIEF PAUSE)

22

23 THE FACILITATOR: It's Bill Klassen --  
24 Bill Klassen. Are there other questions from parties  
25 in the room before I move to staff of the Board, or the

1 staff -- or the Board advisors?

2 MR. NEIL VAN DER GUGTEN: Neil van der  
3 Gugten. With regard to IR-40, the runoff coefficients  
4 for rainfall and snow melt, the response acknowledges  
5 that runoff coefficients for rainfall and snowfall are  
6 point two (.2) to point three (.3) units higher than  
7 those found in the literature. And yet at the same  
8 time it says that the runoff coefficients are  
9 considered realistic.

10 When I look at the annual yield for Lac  
11 de Gras, I understand it's approximately 150  
12 millimetres. And if the mean total annual  
13 precipitation is 345 millimetres, which is adjusted for  
14 undercatch, the implied total annual runoff coefficient  
15 is in the order of point four-three (.43).

16 If I subtract the snowfall sublimation  
17 loss of point three (.3) times 178 millimetres, then  
18 the implied runoff coefficient becomes point five-one  
19 (.51). And those values, I -- I believe, are  
20 consistent -- are consistent with previous studies.

21 So the runoff coefficients used in the  
22 model appear to be 50 percent higher than the overall  
23 Lac de Gras base and values. Now, there may be some  
24 explanation for that. It is not clear to me in the  
25 literature that I could peruse. So could you please

1 explain why they're so high compared to these? And --  
2 and I make reference, too, to the runoff coefficients  
3 that you summarized in your literature review where the  
4 melt, for example, the snow melt, typical values are  
5 from point six (.6) to point seven (.7) and whereas you  
6 used one point zero (1.0).

7                   So I don't understand how you can claim  
8 -- claim that they're realistic. If you could please  
9 explain that.

10                   MR. NATHAN SCHMIDT: Okay. Nathan  
11 Schmidt, with Golder. As I said in the presentation  
12 this morning, I think what this comes down to is kind  
13 of apples-and-oranges comparisons. Oftentimes when  
14 runoff coefficients are expressed, they're based on  
15 data that are collected, you know, downstream of a lake  
16 on a -- on an annual basis.

17                   And so I will say that the numbers that  
18 you presented there, the -- the zero point four-three  
19 (0.43) and the zero point five-one (0.51), I absolutely  
20 agree. And those are actually reflected in our model.

21                   The Lac de Gras/Lac du Sauvage watershed  
22 is very much dominated by the open water. You can well  
23 imagine that the -- the lakes occupy 25, 30 percent of  
24 that surface area. And with an annual precipitation of  
25 say three fifty (350) and a lake evaporation of about

1 270 millimetres, what you can see is that we're getting  
2 very little water contribution from the lakes. The  
3 water contribution is -- is coming from the land.

4                   And so when you smear that total  
5 drainage area, the whole basin area in there, it brings  
6 that coefficient down. So when you talk about the --  
7 you know, the runoff coefficient at the outlet of  
8 Destaffany Lake being point four-three (.43), that's  
9 what our model gets. And to achieve that point four-  
10 three (.43), what we had to do in the building blocks of  
11 the model was for land-only surfaces, we had to have  
12 our coefficients at those values.

13                   One (1) thing I'll add to that is that  
14 the -- the sublimation factor that we included in there  
15 -- like when you think one point zero (1.0), that's --  
16 that means everything's running off. You're not losing  
17 anything. That 30 percent sublimation, there's  
18 uncertainty in there, and there's also some uncertainty  
19 in the undercatch values.

20                   But what happens is, when you combine  
21 all of those together, we come up with this -- this  
22 runoff coefficient, okay? So we may be a little bit  
23 high on the -- on the sublimation value, which means  
24 that we come in correspondingly high on the -- the  
25 runoff coefficient. And at the end of the day, it --

1 it doesn't affect the results of the model.

2 THE FACILITATOR: Further questions?

3 MR. NEIL VAN DER GUGTEN: Neil van der  
4 Gugten. With regard to IR-41, undercatch adjustments,  
5 when precipitation is collected in gauges, there is an  
6 undercatch factor because the actual precipitation is  
7 known to be higher than what is recorded in the gauge.  
8 Environment Canada has developed a -- quite a detailed  
9 set of information to make corrections for that.

10 And for some reason, the analysis was  
11 done using -- and -- and these correction factors vary  
12 quite a bit from day to -- from month to month and year  
13 to year. And for some reason, the analysis was done  
14 using an -- a -- a broad average value applied to each  
15 and every period that you analyzed. And in your  
16 response, you indicated that it only made a difference  
17 of plus or minus 5 percent.

18 But my question is, one (1), why would  
19 you not use the most accurate data you have? Because  
20 this is the main input to your model. It's the  
21 precipitation that varies from year to year and month  
22 to month. Why would you average that out when you have  
23 the actual best data available?

24 Secondly, if you look at the record, the  
25 undercatch adjustment changes in 1981, because they

1 change from snow ruler measurements to nipher gauge  
2 measurements, and that's whv before 1981, if you use an  
3 average, you underestimate the actual precipitation,  
4 and after '81, you overestimate the actual  
5 precipitation by using an average value. And if you  
6 look at the most extreme year, the approach of using an  
7 average value, as you did, gives you 20 percent too  
8 little snowfall and 16 percent too little rainfall for  
9 the greatest years, and not 5 percent.

10 So whv would you use an average mean  
11 value for the adiustment when you have the actual data  
12 that represents the actual record of month by month and  
13 year by year? Thank you.

14

15 (BRIEF PAUSE)

16

17 MR. NATHAN SCHMIDT: Nathan Schmidt,  
18 with Golder Associates. You said, "20 percent." Can  
19 you point out exactly where that -- that difference is?

20 MR. NEIL VAN DER GUGTEN: Neil van  
21 der Gugten. In 1966, if you look at the calendar year,  
22 the adiustment factor for annual snowfall was one point  
23 five-nine (1.59), where you used one point three-two  
24 (1.32). That -- that is a 20 percent difference in the  
25 factor. And you only -- when you apply it to the



1 actual amount of snowfall, it -- it's -- it turns out  
2 to 17 percent.

3                   Rainfall as 1968, the actual factor is  
4 one-thirty-three (133) and the estimated factor --  
5 average factor you used is one point twelve (1.12).  
6 That's 19 percent, so. Those are the two (2) years  
7 that represent the worst difference. Other years will  
8 be less. But nevertheless, there can be significant  
9 differences especially in the early years.

10                   MR. NATHAN SCHMIDT: Yeah. Nathan  
11 Schmidt, with Golder Associates. I will concede that  
12 it is a simplification in the model. Some of the  
13 factors that contribute to undercatch include things  
14 like the -- the wind conditions. You know, not just  
15 the measurement, but wind conditions and other factors.

16                   You know, this could have been  
17 incorporated in the model. I don't believe that it --  
18 you know, at -- at the end of the day, it's not going  
19 to change the -- the assessment conclusions. You know,  
20 perhaps in a future iteration it can be done, but I  
21 don't -- I don't see the need to, you know, go back and  
22 -- and recalibrate on this.

23

24                   (BRIEF PAUSE)

25

1 MR. NATHEN RICHEA: It's -- it's Nathen  
2 Richea here, with Water Resources, ENR. I -- I guess  
3 basically at the end of the questioning, we're back at  
4 the start, which is while we have some current concern  
5 about the quantification of the accuracy of the model  
6 used in the assessment report, and, you know, we've got  
7 a series of questions trying to understand how they did  
8 things and -- and how things were rationalized in the  
9 approach that they took.

10 But, yeah, in the end we're still  
11 looking for that information. If they could quantify  
12 that, that would help us understand, okay, what is the  
13 level of certainty that we have in the model that was  
14 used in the assessment. So hopefully that helps.

15 MS. SACHI DE SOUZA: So with that, if  
16 the -- the current undertaking for validation of the  
17 model will address some of your concerns related to the  
18 accuracy of the hydrologic model. Is that a fair thing  
19 to say to -- at this point in time?

20 MR. NATHEN RICHEA: Yeah, it's Nathen  
21 Richea, with Water Resources. Yes. Yeah, for sure.

22 THE FACILITATOR: It's Bill Klassen  
23 asking if there are questions of Dominion Diamond on  
24 the model? We're still focussed on that within the  
25 room. Or perhaps those who are on the telephone with

1 us, do you have questions before I turn to the staff  
2 here?

3

4 (BRIEF PAUSE)

5

6 THE FACILITATOR: Okay. Hearing  
7 nothing from those on the telephone and not seeing any  
8 indication of further questions from parties in the  
9 room, I'll ask whether staff of the Board have -- have  
10 questions?

11 MS. KATE MANSFIELD: Kate Mansfield,  
12 with the Review Board. This question is relevant to  
13 the Review Board's IR number 22, and it -- the  
14 description of the baseline study area for the  
15 hydrology VC.

16 The first question is pretty simple.  
17 It's just if DDC could clarify that the established  
18 BSA, so the baseline study area, is the same as the  
19 established effects study area for the hydrology VC?

20 MR. RICHARD BARGERY: Richard Bargery,  
21 Dominion Diamond. Just -- just one (1) moment on this,  
22 please.

23

24 (BRIEF PAUSE)

25

1 MS. KATE MANSFIELD: This is Kate  
2 Mansfield, for the Review Board. Just to clarify, this  
3 is probably relevant to DAR Chapter 8, page 811, I  
4 guess.

5

6 (BRIEF PAUSE)

7

8 MR. NATHAN SCHMIDT: Nathan Schmidt,  
9 with Golder. That's actually a question for  
10 hydrogeology. So I'm going to have to pass that along  
11 to Don Chorley.

12 MR. RICHARD BARGERY: Richard Bargery,  
13 Dominion Diamond. Can you just state the question  
14 again? Sorry, I -- I lost it in the flurry here.

15 MS. KATE MANSFIELD: Sure, sorry. It's  
16 just -- Kate Mansfield, for the Review Board. I was  
17 just hoping for clarity that the baseline study area  
18 for hydrology VC is the same as the effects study area.

19

20 (BRIEF PAUSE)

21

22 MR. RICHARD BARGERY: Richard Bargery,  
23 Dominion Diamond. We're -- we're checking on it. I  
24 don't know if there's other questions while we -- while  
25 we do that and we can come back to -- to that one. I

1 don't know if that's a...

2 MS. KATE MANSFIELD: Yeah, sure. So --  
3 this is Kate for -- Kate Mansfield, for the Review  
4 Board. So in response to the Review Board's IR number  
5 22, DDC indicated that the baseline study area was  
6 chosen early in the project description.

7 So we were just hoping to clarify if the  
8 baseline study area was established prior to the  
9 removal of the Cardinal pipe from the project  
10 description, and that it was not changed after the pipe  
11 was removed from the project description.

12 MR. NATHAN SCHMIDT: Nathan Schmidt,  
13 with Golder Associates. I just want to clarify this is  
14 hydrogeology, groundwater, not hydrology, surface  
15 water? So thank you.

16 MS. KATE MANSFIELD: Kate, for the  
17 Review Board. Yes, that's correct.

18

19 (BRIEF PAUSE)

20

21 MR. JOHN FAITHFUL: It's John -- John  
22 Faithful, for -- from Golder Associates. The answer to  
23 that question was that it was established prior to --  
24 to the -- the extraction of the Cardinal part of the  
25 project, or part of the original mine plan.

1                   The -- but with respect to the -- to the  
2 study area built around the Jay project for  
3 hydrogeology, it's still a relevant baseline area. And  
4 so the -- the effects study area would be consistent  
5 with the -- with the baseline study area in that  
6 regard. Thank you.

7

8                   (BRIEF PAUSE)

9

10                  MS. KATE MANSFIELD: Kate Mansfield,  
11 for the Review Board. So then the second question then  
12 would be: Is the same also true for surface hydrology,  
13 that the baseline study area and effects study area are  
14 the same?

15                  MR. NATHAN SCHMIDT: Nathan Schmidt,  
16 with Golder Associates. They are not the same. The  
17 baseline study area, we actually followed the  
18 Coppermine River right down to the mouth, and that was  
19 because we anticipated under the Jay-Cardinal project  
20 much greater effects in terms of, you know, dewatering  
21 and -- and backflooding.

22                  And when it turned into the Jay project  
23 and we saw that the effects were correspondingly much  
24 smaller, we actually changed the effects study area to  
25 end at the outlet of Desteffany Lake.

1 MS. KATE MANSFIELD: Kate Mansfield,  
2 for the Review Board. Thank you. So given that the  
3 baseline study area and effects study area were  
4 selected with the inclusion of the Cardinal pipe in the  
5 project description, the -- the question is just: If  
6 using a smaller, more Jay-specific study area would  
7 change the determination of significance effects, given  
8 that the effects study area would be much smaller?

9

10 (BRIEF PAUSE)

11

12 MR. JOHN FAITHFUL: It's -- it's John  
13 Faithful, from Golder Associates. So -- so the  
14 reduction of the -- the study area to -- to an effects  
15 study area is really -- it's really relevant to -- to  
16 the assessment.

17 If there -- if the project does -- does  
18 reduce, and so the focus is on the Jay project, it's --  
19 it's relatively immaterial as to -- to whether or not  
20 it does influence significance. The baseline study  
21 area being larger allows for the collection of a lot  
22 more baseline information and -- and for the -- a -- a  
23 lot more information with respect to -- to comparison  
24 to predicted concentrations.

25 The effects study area really -- really

1 looks at -- at the zone, or the extent to which any  
2 measurable changes as a result of the project would --  
3 would occur. And so the -- the reduction of the study  
4 area for effects compared to the -- to the baseline  
5 study area is purely linked to -- to where you would  
6 expect those measurable effects to occur, so.

7

8

(BRIEF PAUSE)

9

10 MS. KATE MANSFIELD: Thank you. I  
11 might have a follow-up question later, but that -- this  
12 is Kate, for the Review Board. I might have a follow-  
13 up question later, but thank you.

14 MR. NATHEN RICHA: It's -- it's Nathen  
15 Richa, with Water Resources, here. I wonder if I  
16 could just try to understand sort of the question and  
17 response portion there. I -- I think we're talking  
18 about assessment boundaries potentially, and discussion  
19 about what an appropriate assessment boundary might be  
20 for the expansion project, which would be the Jay  
21 project.

22 But I understand there's two (2) zones  
23 of impact that could happen from the Ekati operation.  
24 Obviously, there's the one that discharges from the  
25 main site of the operation down into Slipper Lake, the



1 Slipper Lake outlet and into Lac de Gras. But then  
2 there's also the proposed project, which happens in Lac  
3 du Sauvage, which is upstream of Lac de Gras.

4                   And upon review of the Developer's  
5 Assessment Report, it seems like the local study area  
6 has been identified as the outlet of Lac de Gras. And  
7 I think, if I'm following the question, I think the  
8 question might be along the lines of if an initial  
9 assessment boundary could be put closer to the Jav pipe  
10 to assess the potential impacts of that operation on  
11 the immediate receiving environment that it has.

12                   And then there would be a sorp -- a  
13 separate assessment endpoint from the operation as a  
14 whole, which might be further downstream, which might  
15 be the outlet of Lac de Gras.

16                   Does that capture sort of the question?

17                   And I'm not sure I understood the  
18 answer. I think the answer seemed to talk about, well,  
19 really, the only assessment point that we need to worry  
20 about is where you might measure an effect. But I  
21 don't think that's accurate in this case, given the  
22 complexity of the operation in the receiving  
23 environments that were -- that we're going to see from  
24 this operation.

25                   So I wonder if we could just sort of

1 flesh that out a bit further and maybe try to  
2 understand some of the rationale for the different  
3 assessment boundaries that are proposed in the  
4 Developer's Assessment Report.

5

6 (BRIEF PAUSE)

7

8 MR. JOHN FAITHFUL: It's John Faithful,  
9 from Golder Associates. If we use water quality for --  
10 as an example, Nathan, you know, we -- we have an  
11 assessment boundary that encompasses both -- both Lac  
12 du Sauvage and Lac de Gras through to the outlet of Lac  
13 de Gras.

14 We don't focus our total assessment on  
15 potential effects to -- to those lakes at only just the  
16 outlet of Lac de Gras. The assessment case takes into  
17 account the changes that occur in Lac du Sauvage. They  
18 are -- they are more immediate around where the -- the  
19 pit development is occurring, but it also extends into  
20 -- into Lac de Gras.

21 And -- and there is various assessment  
22 nodes through Lac du Sauvage that extend through to --  
23 to Lac de Gras that also account for project effects,  
24 as well as the cumulative effects that it may have on  
25 the other ongoing operations.

1 THE FACILITATOR: Do you have -- it's  
2 Bill Klassen -- a follow-up or a response to this? Or  
3 -- Kate, I'm -- I'm afraid I've lost track of who's  
4 asking the questions here. So let's try to get a  
5 little focus here, at least for my benefit.

6 MS. KATE MANSFIELD: This is Kate  
7 Mansfield, with the Review Board. Thanks, John. Could  
8 you please just clarify one (1) point that you said  
9 there? So the measurement indicator and therefore the  
10 way that you would determine significance of an effect  
11 is measured at the Lac de Gras outflow for surface  
12 hydrology?

13

14 (BRIEF PAUSE)

15

16 MR. JOHN FAITHFUL: It's John Faithful  
17 -- John Faithful, for Golder Associates. I'm going to  
18 initiate the answer. I'm going to talk about the  
19 significance part, and then I'm going to pass it on to  
20 -- to Nathan, who's going to respond to the  
21 hydrological component of the assessment.

22 So for Section 8, water quantity and  
23 water quality, in evaluating significance, we -- it  
24 comes down to that assessment endpoint that I talked  
25 about in our presentation.

1                   It's really -- the important part of --  
2 of determining the influence of this project on the  
3 receiving environment is whether or not there is a --  
4 there's -- that water quality remains suitable to  
5 provide for functioning, healthy aquatic ecosystems,  
6 and that the -- that the use of that water is still  
7 maintained for -- for whatever terms, wildlife use,  
8 human use, traditional use, okay?

9                   So we take into account all the elements  
10 that feed into that potential assessment endpoint. So  
11 we have hydrogeology that is linked to -- to the  
12 watershed through the pit development that results in -  
13 - in groundwater inflows that have to be managed that  
14 aff -- that potentially influence the surface water in  
15 Lac du Sauvage and Lac de Gras through pumping  
16 discharge.

17                  We look at the -- the hydrological  
18 changes, whether that's water levels, water flows, how  
19 that impacts upon whether or not that assessment  
20 endpoint is -- is protected. And then ultimately water  
21 quality, which -- which is used -- where -- which --  
22 which is effectively changed by the project activities  
23 through hydrology and hydrologic -- and hydrogeological  
24 inputs.

25                  Okay. So all of that is integrated in

1 terms of allowing us to start to evaluate whether there  
2 is a significant adverse effect to the receiving  
3 environment. We utilize protection of aquatic life  
4 guidelines. We use aquatic health benchmarks. We use  
5 drinking water qual -- guidelines -- drinking water  
6 guidelines to evaluate what our predicted water quality  
7 conditions are to determine whether or not there is a  
8 risk of an adverse environmental effect or a risk to  
9 our assessment endpoint not being achieved. Okay.

10 So I'm -- I'm going to pass it on to --  
11 to Nathan now, and he can -- unless I've already  
12 answered your part of the question, Nathan.

13 MR. NATHAN SCHMIDT: Nathan Schmidt,  
14 with Golder Associates. And I just wanted to clarify  
15 that with the hydrological assessment we -- we do  
16 assess it at multiple nodes where there are project  
17 defects that could be experienced. For instance,  
18 Desteffany Lake outlet, Lac de Gras outlet, Lac -- Lac  
19 du Sauvage outlet and then the -- the smaller  
20 tributaries that are, you know, in the -- in the  
21 project footprint area.

22 And so we pass that information on to  
23 water quality and to the other disciplines for them to  
24 integrate those effects into their assessment.

25 MR. JOHN FAITHFUL: So it's -- it's

1 John Faithful again. Thanks for that, Nathan. I guess  
2 one (1) -- one (1) part that I -- that I should have  
3 got to that I didn't get to in my response is, so, we  
4 evaluate these changes from -- from the project through  
5 the operations and -- and into post-closure. We  
6 examine within the effects study area that we're  
7 focussing on. We look at -- we look at if -- if there  
8 are changes that are going to potentially approach  
9 these -- these thresholds that we use to -- to  
10 determine where there is -- there -- there is risk.

11                   We look at the magnitude of the change.  
12 We look at the geographical extent of -- of any change  
13 and we look at -- at the duration. There's a number of  
14 key classifiers that are used in the determination of  
15 significance and they all come into play. The -- the  
16 fact that we use these protection guidelines as our --  
17 as our benchmark is appropriate to evaluate risk. We  
18 look at the -- that the duration that any of these  
19 changes may occur and -- and whether or not there is --  
20 there is heightened risk. That's the -- that's the  
21 critical piece in terms of where we determine whether  
22 or not significance. It's the change that we see is a  
23 significant change.

24

25                   (BRIEF PAUSE)

1 THE FACILITATOR: Okav. Thank you.  
2 It's Bill Klassen. We have other topics that I would  
3 like to hear if there are any questions on. And so  
4 I'll ask Sachi to take us to the next one (1).

5 MS. SACHI DE SOUZA: Sachi De Souza,  
6 with the Board. So I've -- there were a number of IRs,  
7 one (1) of which was from the Review Board number 47  
8 related to the possible effect of wet and dry years on  
9 the predictions, the hydrologic predictions for Lac de  
10 Gras and Lac du Sauvage. And they were done for an  
11 average climate and with the understanding that an  
12 average climate was suitable. In the response to  
13 number -- number 47 you provided what the change in the  
14 baseline would be for the yield for non-average years.

15 So first of all I'm assuming that a 3  
16 percent reduction in yield would be a 3 percent  
17 reduction in the discharge?

18 MR. NATHAN SCHMIDT: Nathan Schmidt,  
19 with Golder. That's correct. The mean annual  
20 discharge.

21 MS. SACHI DE SOUZA: Sachi De Souza,  
22 with the Board. The next question is so you've -- on  
23 this table it -- it shows that for a -- a dry event of  
24 a one (1) in twenty (20) year event you would see a 7  
25 percent reduction in yield.

1                   My interpretation of that is that that  
2 would -- is what would happen after one (1), one (1) in  
3 twenty (20) year event. I think what the -- the long-  
4 term concern here is, what happens over a series of  
5 those years? And from your -- the response I kind of  
6 captured, what would have to -- after a series -- after a  
7 series of -- of wet or dry years, and how that would be  
8 propagated in Lac du Sauvage and Lac de Gras?

9

10                                   (BRIEF PAUSE)

11

12                   MR. NATHAN SCHMIDT: Nathan Schmidt,  
13 with Golder Associates. The modelling that we did for  
14 that assumes that the pumping rate will occur at the  
15 rate that is -- at rates and durations that are  
16 presented in the Water Management Plan.

17                   We haven't considered any mitigation in  
18 there for potential dry conditions. And in advance of  
19 any backflooding, there would need to be a plan  
20 developed to set trigger levels, you know, identify  
21 conditions where you would throttle back the pumping or  
22 suspend pumping.

23                   And so, you know, the intent isn't to,  
24 you know, have successive dry years where we just keep  
25 the pumps going. The intent would be to, you know,



1 come up with something that would be compatible with,  
2 you know, and non-adverse effects.

3 MS. SACHI DE SOUZA: Sachi De Souza,  
4 with the Board. So related to that, for the Board to  
5 understand the potential significant adverse impacts,  
6 it -- it does need to understand what those -- what  
7 those are with and without the Jay -- or conditions  
8 with and without the Jay project so that if the Jay  
9 project is potentially having to backflood during dry  
10 years, we do have an understanding of that.

11 And something that would help for the  
12 Board's understanding is a presentation of -- of the  
13 key discharge points, so for example, the Lac du  
14 Sauvage outlet, the Lac de Gras outlet, and how those -  
15 - those discharge levels or water surface elevations  
16 would change or would -- yeah, would change in -- with  
17 a series of different scenarios. So a series of wet  
18 years, a series of dry years.

19 Because what will happen is when you  
20 show the WWHPP project scenarios, in order to  
21 understand the potential effects, we need to see that  
22 comparison. Is that -- have I explained that properly?

23

24 (BRIEF PAUSE)

25

1 MR. NATHAN SCHMIDT: Nathan Schmidt,  
2 with Golder Associates. First of all, I -- I'd like to  
3 make the point that we will have many years of data  
4 collection, for instance, at the narrows, you know,  
5 during the project before we get to the -- the  
6 backflooding period when these things will become  
7 relevant.

8 And I -- I guess we just want to  
9 reiterate that these are -- this backflooding flow is a  
10 managed flow, and that absolutely it could be managed  
11 to avoid, you know, dropping and causing an adverse  
12 effect at those locations.

13 And so, I mean, I guess what you're  
14 asking for there, we're trying to answer it  
15 qualitatively and say, We're not going to run into that  
16 situation. It would simply extend the backflooding  
17 period if we had successive dry years of -- of flow at  
18 those locations.

19 MS. SACHI DE SOUZA: Sachi De Souza,  
20 with -- with the Board. Keeping on the theme of -- of  
21 what would be an adverse effect, I have -- I have two  
22 (2) questions for you. The first of which is: At what  
23 elevate -- water surface elevation in -- in Lac -- in  
24 the narrows is -- is fish passage not going to happen,  
25 would it not happen?

1                   And second of all -- because that's --  
2   that's what I'm thinking is a potential adverse impact,  
3   here. And beyond that, I guess, what are -- what are  
4   Dominions -- what would Dominion consider an adverse  
5   impact for this hydrology point of view?

6

7                   (BRIEF PAUSE)

8

9                   MR. RICHARD BARGERY:   Richard Bargery,  
10   Dominion Diamond. So as -- as Nathan said, if it's an  
11   issue of -- of the back -- you know, the -- the effect  
12   on water levels because of backflooding, which we have  
13   control over, that's one (1) issue. If it's an effect  
14   on water levels because of a succession of -- of dry  
15   years, which we don't have any control over, I'm just  
16   trying to -- to narrow and -- and identify exactly what  
17   you're asking for, Sachi.

18                   Is it -- is it an issue of how much  
19   water we're drawing to backflood the -- the pits,  
20   because we have control over that. And as -- as Nathan  
21   said, I mean, we're -- we're not going to do anything  
22   that would compromise the integrity of the lake.  
23   During that period, we'll have many years of -- of data  
24   and monitoring while Jay is operational. And, you  
25   know, we have flexibility in terms of how long it would

1 take to backflood -- backflood the diked areas.

2                   So -- so, you know, we think there are  
3 solutions there. I mean, it's a matter of -- of  
4 adjustment, but -- so is that the question? Is it  
5 based on our backflooding, or if it's just a -- a  
6 general question about what happens if there's a suc --  
7 succession of dry years and what it means for -- for  
8 the narrows?

9                   DR. NEIL HUTCHINSON: Neil Hutchinson,  
10 for the Board. I -- I think the question here relates  
11 to, you -- you said that if several dry years were to  
12 occur in a row and -- and there was more of an effect  
13 on lake level than you're predicting here, you would  
14 manage to avoid that.

15                   I guess the question is, is what would  
16 trigger that management? How would the Board know when  
17 the water levels drop so far, what you would consider  
18 would be an average effect that you'd have to  
19 manipulate your pumping level for?

20

21                   (BRIEF PAUSE)

22

23                   MR. RICHARD BARGER: Richard Barger,  
24 Dominion Diamond. I -- I guess from our understanding,  
25 those types of limits would be set during the water

1 licensing phase of -- of the regulatory process. I  
2 don't think we can say, at this point, you know, what  
3 that limit would be or what -- what our view on that  
4 limit would be right now.

5 DR. NEIL HUTCHINSON: Neil Hutchinson,  
6 for the Board. I'm thinking of the Wek'eezhii Land and  
7 Water Board, who would be regulating this, their  
8 response framework, which you set a series of action  
9 levels that you anticipate and manage, so you never get  
10 to a significance threshold.

11 The question is, we have to understand  
12 what the significance threshold that is coming out of  
13 the EA process to -- to feed that next step.

14 MS. SACHI DE SOUZA: Sachi De Souza,  
15 with the Board. Just to add one (1) more piece of  
16 information to that, it -- this threshold we're looking  
17 for, it -- it can be quantitative in terms of a level,  
18 but it can also be qualitative.

19

20 (BRIEF PAUSE)

21

22 MR. RICHARD BARGERY: Yeah. Richard  
23 Bargery, Dominion Diamond. We're going to take this  
24 one under advisement with -- with respect to the -- the  
25 specific answer, and we'll get back to you before the

1 end of -- the end of -- of the -- the technical  
2 sessions likely, yeah, on this issue.

3 MS. SACHI DE SOUZA: So Sacha De Souza,  
4 with the Board. To get some clear wording on this,  
5 Dominion is going to investigate at what threshold for  
6 the water surface level or the narrows would indicate a  
7 trigger for action levels for operations. I worded  
8 that terribly.

9 The -- Sachi De Souza, with the Board.  
10 So what the trigger would be for -- for backflooding.

11 MR. RICHARD BARGER: Richard Barger,  
12 Dominion Diamond. I think generally, yes, that's -- is  
13 the commitment. I -- I think we -- we know what --  
14 yeah, what -- what was asked. So we'll -- we'll take  
15 that away and -- and come back with an answer.

16 THE FACILITATOR: It's Bill Klassen.  
17 At the end of the day, of course, there will be a wrap-  
18 up of what the various responses are that -- that will  
19 be on the list.

20 We've been at this now for about an hour  
21 and a half. I suggest we take a short break, and then  
22 we'll come back and continue the discussion, a short  
23 break being ten (10) minutes.

24

25 --- Upon recessing at 2:10 p.m.

1 --- Upon resuming at 2:25 p.m.

2

3 THE FACILITATOR: Okay. Would everyone  
4 take their seats? And I will ask Sachi to introduce  
5 the next topic. We're -- we're now on site water  
6 management and closure, and we will get it on the  
7 screen here.

8

9 (BRIEF PAUSE)

10

11 MS. SACHI DE SOUZA: It's Sachi De  
12 Souza, with the Board. I want with -- the conversation  
13 will -- discussion will start with site water  
14 management. And the first item will be the waste rock  
15 storage area. And I will leave it at that.

16 THE FACILITATOR: It's Bill Klassen.  
17 So we have site water management and closure and -- and  
18 initially site water management with respect to waste  
19 rock storage area and seepage therefrom. Are there  
20 questions of -- of the Developer on that topic? So  
21 waste rock storage area seepage. I see no interest in  
22 that in -- in the room.

23 Is there anyone on the telephone that  
24 has an interest in asking any questions related to  
25 waste -- site water management and waste rock storage

1 area seepage?

2 MS. SACHI DE SOUZA: Peter Unger.

3 THE FACILITATOR: Peter does. Okay.

4 Thank you.

5

6 (BRIEF PAUSE)

7

8 MR. PETER UNGER: Hi. Peter Unger,

9 Lutsel K'e. I -- I asked this yesterday by mistake. I  
10 had thought I had missed my opportunity. It's just a  
11 very quick question. I asked earlier about the waste  
12 rock storage area and -- and the possibility of it  
13 thawing out. I was a little bit curious.

14 What are the risks of seepage, were it  
15 to thaw out? And I noticed that you did account for  
16 some climate change scenarios, but you used scenario  
17 A1B for greenhouse gas emissions which is the -- the  
18 more moderate scenario. And you discounted scenario  
19 A2. And I was curious -- which is the high emission  
20 scenario which would, of course, lead to a more  
21 dramatic change in climate.

22 I was curious to know what your  
23 justification for dismissing scenario A2 is and -- and  
24 again my original question is, is were the waste rock  
25 storage area to thaw out, what is the risk of seepage?



1 Thank you.

2 MR. MICHAEL HERRELL: It's Mike  
3 Herrell, from Golder Associates. So the site water  
4 quality model was developed for -- that included the --  
5 the Jav waste rock storage area. And the drainage from  
6 the Jav waste rock storage area during operations was  
7 directed to the -- the Miserv -- the upper layer of the  
8 -- the Miserv pit and then subsequently discharged to -  
9 - to Lac du Sauvage. And in closure it does drain  
10 directly to Lac du Sauvage.

11 The predictions in -- in the site water  
12 quality model don't account for freezing of the pile.  
13 So effectively the water estimates that were evaluated  
14 as part of the site water balance model conceptually  
15 account for a climate change scenario. So the volumes  
16 that would be estimated don't account for freezing in  
17 the pile. So any effects from not freezing of the pile  
18 on -- on water quality in -- in the downstream  
19 receiving environment have been accounted for in the  
20 DAR.

21 MR. PETER UNGER: Peter Unger, Lutsel  
22 K'e again. So that answers my first question. Thank  
23 you very much. And then basically I'll guess will  
24 answer the previous.

25 So you just did not deem it necessary to

1 look at a higher emission scenario in terms of cli --  
2 climate change? You didn't see that as having any  
3 potential effect?

4 MR. MICHAEL HERRELL: It's Mike  
5 Herrell, from Golder Associates. Yeah, we -- the  
6 assumption is that it's already thawed so there -- that  
7 is -- that scenario is already accounted for.

8 MR. PETER UNGER: Thank you very much.

9 DR. NEIL HUTCHINSON: Thanks. Neil  
10 Hutchinson, for the Board. Mike, I just wanted to  
11 clarify. You -- you're saying that all of the waste  
12 rock storage area drains to the Jav pit and the sump  
13 and none of it to the natural environment? We were  
14 kind of confused. We get different opinions.

15

16 (BRIEF PAUSE)

17

18 MR. MICHAEL HERRELL: It's Mike  
19 Herrell, from Golder Associates. Just to clarify. So  
20 during operations the -- the drainage from the Jav  
21 waste rock storage area goes to the Jav -- Jav sump  
22 which is then pumped to Miserv and Lac du Sauvage. And  
23 at -- in post-closure it drains directly to Lac du  
24 Sauvage.

25 DR. NEIL HUTCHINSON: Neil Hutchinson,

1 for the Board. So I -- I presume -- and some --  
2 somehow the Closure Plan includes monitoring for  
3 seepage and -- and initiatives to -- to manage that  
4 seepage if it becomes a problem?

5 MR. ERIC DENHOLM: Yeah, it's Eric  
6 Denholm speaking. Yes. Closure plan provides for a  
7 nominal ten (10) year monitoring period for each -- you  
8 know, according to each reclaimed mine component.

9 MS. SACHI DE SOUZA: Sachi De Souza,  
10 with the Board. For the portion of the pile that's to  
11 the north, it's going to be -- is there going to be a  
12 sump over there on that side, or is there a tow drain  
13 to collect it and move it to the -- the diked area, or  
14 what's the plan?

15

16 (BRIEF PAUSE)

17

18 MR. MICHAEL HERRELL: It's Mike  
19 Herrell, from Golder Associates. So that -- that  
20 assumption was carried forward into the model, so it's  
21 the contingency plan that it would be pumped to Miserv  
22 -- or to the Jav sump during operations. However,  
23 it'll be monitored during operations, and if it meets  
24 the -- the discharge water quality criteria that's set  
25 as part of the water licence, then it will -- that --

1 that proportion of the pile will be discharged to Lac  
2 du Sauvage.

3 MS. SACHI DE SOUZA: Sachi De Souza,  
4 with the Board. I'm going to go down a line of  
5 questioning from that. Some of these questions are --  
6 are from the Board's technical advisor for  
7 geochemistry, so I'm going to be asking them on -- on  
8 their behalf.

9 So the first question is related to the  
10 monitoring of that seepage. From what I understand,  
11 it's going to be monitored during the -- the freshette,  
12 so in the -- the first summer freshette, and then also  
13 once in the fall.

14 Is there an intention to monitor more  
15 frequently than twice a year to confirm that there  
16 isn't seepage being produced, and that it's not being  
17 released into the downstream environment?

18 MR. ERIC DENHOLM: Yeah, it's -- it's  
19 Eric Denholm speaking. So the -- the twice per year  
20 comes from the established Waste Rock and/or Storage  
21 Management Plan, and it has a seepage monitoring  
22 protocol in it that would be applied to the Jay waste  
23 rock storage area. So it's -- that's where the -- the  
24 twice per year comes from, and that's what is antici --  
25 is anticipated and planned.

1                   There have been times where if there's a  
2 -- a specific purpose and a need that can -- on a -- as  
3 part of an adaptive management plan, then that can  
4 include additional sampling where needed.

5                   MS. SACHI DE SOUZA:     Sachi De Souza,  
6 with the Board. The existing plan for monitoring is --  
7 is based on the existing Ekati operations, and my  
8 understanding is that for the most part, you're not  
9 experience -- you're not seeing a lot of seepage.

10                  Are there pits -- or waste rock piles,  
11 sorry, that are showing more seepage than originally  
12 estimated? And I'm thinking about the -- the Pigeon  
13 pile that was referenced in -- in the IR responses, and  
14 ongoing work right now that's at the Land and Water  
15 Board for the pox -- Fox waste rock pile. And -- I'll  
16 leave it at -- there.

17

18   (BRIEF PAUSE)

19

20                  MR. ERIC DENHOLM:     Yeah, it's Eric  
21 Denholm speaking. So just -- just on a -- a slight  
22 correction. The Pigeon pile is just now under --  
23 starting under construction, so it's not constructed as  
24 yet, I think.

25                  But what I'd say is -- is, So -- so

1 currently there's no -- there's no seepages from --  
2 from any of the Ekati rock piles that's requiring  
3 active intervention, or management in some ways. So --  
4 yeah. Thanks.

5 MS. SACHI DE SOUZA: Sachi De Souza,  
6 with the Board. I'll -- I'll leave that, and I'll just  
7 go through this list of questions from geochemistry, if  
8 that's okay? There's about six (6), and I'm just going  
9 to read them word for word so I don't get them wrong.

10 So the first question is -- this is  
11 related to seepage and the potential for -- for metal  
12 leaching or acid rock drainage from the waste rock  
13 storage area for the Jav Pit -- for the Jav pile:

14 "Since the metasediments, sediments,  
15 granite, and dyke base for the Jav  
16 project have been described to be  
17 similar to the waste rock from the  
18 other Ekati operations, it is likely  
19 that seepage water quality data from  
20 the waste rock storage facilities  
21 would -- would be a great proxy for  
22 projecting seepage water quality for  
23 the Jav waste rock storage area."

24 Have other waste rock storage facilities  
25 been in place long enough, five (5) to ten (10) years,

1 where the geochemical processes to affect seepage  
2 discharge, and if so, what are the water quality  
3 characteristics?

4 And as a follow-up to that, is there  
5 seepage water quality data for these other facilities?

6 MR. MICHAEL HERRELL: It's Mike  
7 Herrell, from Golder Associates. I -- I agree with  
8 that statement. It is a great proxy and that's  
9 effectively what we've done in the modelling. We've  
10 used the -- the Miserv waste rock storage area, since  
11 that's the -- the closest composition to the -- the Jav  
12 storage area, as a proxy for -- for inputs into the --  
13 the water quality modelling.

14 In terms of the data that's used -- or  
15 if there is seepage data available, yes, there is  
16 seepage data available. And I -- I think to -- the --  
17 the most direct response to that question, if they're  
18 looking for data, in Appendix 8E of the DAR, the input  
19 for the waste rock storage area is summarized in there.  
20 I'll -- if you -- I'll just pull out the table number  
21 there.

22 So that's in Table 8E3.4-1 of Appendix  
23 8E of the DAR.

24 MS. SACHI DE SOUZA: Sachi De Souza,  
25 with the Board. The second question is:

1 "Is the construction of field cells  
2 lined pads with different  
3 configurations, materials, and  
4 instrument -- instrumentation  
5 designed to collect seepage and  
6 monitor temperature conditions being  
7 considered as part of operational  
8 monitoring for the Jay project?"

9

10 (BRIEF PAUSE)

11

12 MR. ERIC DENHOLM: It's -- it's Eric  
13 Denholm speaking. There's no -- there's no plans and  
14 we don't see the need for -- for those types of long-  
15 term research tests. We've got actual operating data  
16 and actually -- actual operating rock piles at the  
17 Ekati site. And so we wouldn't see any -- any value  
18 for -- for Ekati or for the Jay project in those types  
19 of long-term research tests.

20 MS. SACHI DE SOUZA: Sachi De Souza,  
21 with the Board. The next question relates to the --  
22 not directly with the geochemistry, but for -- on day 1  
23 the lakebed sediments are going to be excavated and  
24 trucked off the diked area and put in the vicinity of  
25 the waste rock storage area to dry.



1                   First of all, are there dust and water  
2   quality concerns related to that silt? Second of all,  
3   could that silt be -- how will that silt be utilized in  
4   the construction of the waste rock storage area, or  
5   will it be used in any way to enhance the waste rock  
6   storage area?

7                   MS. FIONA ESFORD:   This question is --  
8   it's Fiona Esford, from Golder. This question is very  
9   similar to a question we answered on Monday related to  
10  the silt from -- from the excavation activities. And  
11  if the quarry is developed as part of the dike  
12  development we'll use the quarry for the storage and  
13  placement of that silt material. And -- and if we do  
14  not develop the quarry it will still be placed within  
15  the waste rock storage area footprint and -- and cells  
16  would be developed with some -- some rock around it to  
17  ensure that it's placed in a stable manner.

18                  And dust or water quality issues are not  
19  anticipated.

20

21                                       (BRIEF PAUSE)

22

23                  MS. SACHI DE SOUZA:   Sachi De Souza,  
24  with the Board. The next question is:

25                                       "Has there been any quantitative

1                   seepage water quality assessment,  
2                   mass balance assessments, and flow  
3                   estimates based on different freezing  
4                   scenarios?"

5                   MR. MICHAEL HERRELL:     It's Mike  
6     Herrell, from Golder Associates.  As -- in response to  
7     Peter's question earlier, the -- the assumption in the  
8     model is that the -- in the site water balance is that  
9     the -- the pile will not freeze, and it's the -- the  
10    runoff and seepage estimates, use that as an assumption  
11    into the model.

12                  As for estimates of water quality, we  
13    used the Miserv seepage data as a proxy, so we didn't  
14    estimate water quality from the pile.  We applied a  
15    water quality to the drainage from the pile.

16                  MS. SACHI DE SOUZA:     Sachi De Souza,  
17    with the Board.  The last question here is:

18                  "Do the results of the ARD analysis  
19                  or management plans change if the  
20                  carbonate neutralization potential is  
21                  used to estimate PAG or non-PAG  
22                  behaviour as opposed to the bulk  
23                  neutralization potential?"

24

25                                 (BRIEF PAUSE)

1 MR. RICHARD BARGERY: Richard Bargery,  
2 Dominion Diamond. It's going to take us a little  
3 while, I think, so we're going to have to -- we're  
4 going to have to come back with -- and look that up and  
5 come back with an answer on -- on that specific  
6 question.

7 MS. SACHI DE SOUZA: Is that a homework  
8 or undertaking for you guys?

9 MR. RICHARD BARGERY: Let's call it  
10 homework.

11 MS. SACHI DE SOUZA: Sachi De Souza,  
12 with the Board. So to clarify, the wording is -- the  
13 question was:

14 "Do the results of the ARD analysis  
15 or management plans change if the  
16 carbonate neutralization potential is  
17 used to estimate PAG or non-PAG  
18 behaviour as opposed to the use --  
19 opposed to using bulk neutralization  
20 potential?"

21 MR. RICHARD BARGERY: Yeah. Richard  
22 Bargery, Dominion Diamond. Yeah, that's -- that's the  
23 question. But at the end of the day, we'll come back  
24 to the actual wording on the screen, I'm sure, and --  
25 and we -- after we have a discussion, we can talk a

1 little bit more about if it's homework or -- or an  
2 undertaking, depending on who we need to -- to discuss  
3 that with.

4 MS. SACHI DE SOUZA: Sachi De Souza,  
5 with the Board. Just a follow-up to Eric's response  
6 about the -- the monitoring. One (1) of the concerns I  
7 think related to the monitoring of seepage is the  
8 proximity to Lac du Sauvage and the importance of Lac  
9 du Sauvage to traditional users and people in the area.

10 So would it be reasonable to do seepage  
11 or testing more frequently, or would that still all  
12 come under the adaptive management approach?

13

14 (BRIEF PAUSE)

15

16 MR. ERIC DENHOLM: Yeah, it's -- it's  
17 Eric Denholm speaking. I think -- I think we -- we had  
18 -- we had relied to a large extent on the current  
19 approach in the WROMP has been tried and trued and  
20 proven up and -- and has worked well.

21 Those who are familiar with it know that  
22 a lot of time, there are -- in a lot of these seeps,  
23 there aren't -- isn't water to sample twice a year, I  
24 mean. So we keep in mind that a lot of the times it's  
25 only a -- spring is only -- is the only time that

1 there's any water to sample.

2 And also as a reminder, there's all the  
3 -- the seepage program already does have this adaptive  
4 management component that often one (1) of the early  
5 steps is to -- to do increased frequency of sampling.

6 THE FACILITATOR: It's Bill Klassen.  
7 Are there any further questions related to the waste  
8 rock storage area seepage topic? Tim...?

9 MR. TIM BYERS: Tim Byers, with the  
10 Monitoring Agency. My question is in relation to the  
11 proximity of the waste rock storage area to major water  
12 body.

13 And so my question is: You have a  
14 buffer zone of 100 metres to Lac de Gras itself. And  
15 as I stated -- or as we stated in -- in IR, we're  
16 concerned that there's only a 30 metre buffer between  
17 the wet rock pile and a stream that flows into Lac de  
18 Gras. I'm not sure if that's an intermittent stream or  
19 not. Or, sorry, Lac du Sauvage, into Lac du Sauvage.  
20 I don't know if that's an intermittent stream or not,  
21 but it's on the north side of the proposed rock pile.

22 And so I'm wondering, would there not be  
23 a greater potential for seepage entering Lac de Gras  
24 through a -- sorry, I did it again -- Lac du Sauvage  
25 through a stream at 30 metres' distance as opposed to

1 directly at 100 metres' distance?

2

3 (BRIEF PAUSE)

4

5 MR. TIM BYERS: I -- I'm sorry. Could  
6 we put slide 4 of the presentation? Because I think  
7 it's a very good map of that rock pile and its  
8 proximity to the stream. Thanks.

9

10 (BRIEF PAUSE)

11

12 MS. FIONA ESFORD: Fiona Esford, Golder  
13 Associates. Just for reference, like, 30 metres is --  
14 is more than the width of this room, and -- and so we  
15 feel that 30 metres is adequate. If seepage water  
16 quality indicated that we need to -- to implement  
17 adaptive management and -- and collect that seepage, we  
18 have adequate space in order to do that before it  
19 entered the receiving environment of that stream.

20 MR. TIM BYERS: Tim Byers again, with  
21 the Agency. So does that mean a potential contingency  
22 is to dig a collection ditch on that north side to  
23 collect any potentially contaminated seepage from  
24 entering the stream?

25 MS. FIONA ESFORD: Fiona Esford, Golder

1 Associates. That would be one (1) of many potential  
2 options, depending on the volume and the quality of  
3 water as to how the water would be captured and -- if  
4 necessary.

5 MR. TIM BYERS: Thank you for that. My  
6 colleague reminds me that looking closer at this map,  
7 there is -- seems to be a fairly steep grade at that  
8 northern most point. And I'm not sure if that will  
9 influence your perception of the potential for seepage  
10 entering the -- Lac du Sauvage through that stream.  
11 Thank you.

12

13 (BRIEF PAUSE)

14

15 MR. KEVIN O'REILLY: Sorry. It's Kevin  
16 O'Reilly, with the Agency. I guess the other point  
17 that we would like to add, too, is that I believe for  
18 virtually all of your other waste rock piles, except  
19 possibly for Pigeon, you rely on permafrost -- permafrost  
20 encapsulation. This one, that's not the case. And  
21 given its proximity to a major water body and steep  
22 contours, the proximity to a -- a stream that runs  
23 close to it, I just wonder about making sure that  
24 seepage, if it does happen, doesn't become a real  
25 problem. Thanks.

1 MS. FIONA ESFORD: In terms of the  
2 water quality modelling, both inputs and -- and seepage  
3 quantities, we assume that it doesn't freeze. However,  
4 the way the pile is managed, we will do everything to  
5 promote permafrost into it -- developing into the pile,  
6 and we still would like permafrost and expect that  
7 permafrost will grade into the pile.

8 MR. KEVIN O'REILLY: It's Kevin  
9 O'Reilly, for the Agency. Has DDC actually identified  
10 locations, then, where you would put in thermistor  
11 cables in the waste rock pile to look at -- or so that  
12 you could monitor and make sure that encapsulation is  
13 actually occurring, especially on the north side of the  
14 waste rock pile next to the stream and next to Lac du  
15 Sauvage? Thanks.

16 MR. RICHARD BARGERY: It's Richard  
17 Bargery, Dom -- Dominion Diamond. Are you asking have  
18 we identified the locations, or it -- or whether we  
19 will do that? Because the answer to that -- if it's  
20 locations, no, we -- we haven't identified locations  
21 yet. But we take your point on -- on those -- those  
22 areas that you pointed -- those two (2) areas you  
23 pointed.

24 MR. KEVIN O'REILLY: Thanks. Kevin  
25 O'Reilly, with the Agency. Yeah, we -- we noted in



1 your response to IR-22 that you do intend to have  
2 thermistor cables in there, but it didn't say where or  
3 when, and so on. So if you have any additional details  
4 on that, that'd be helpful, but...

5

6 (BRIEF PAUSE)

7

8 MR. ERIC DENHOLM: Sorry. Eric Denholm  
9 speaking. So -- so the -- the water licence requires a  
10 waste rock storage area design report submitted to  
11 Wek'eezhii Land and Water Board, and that's where we'd  
12 suggest that information would be appropriately  
13 provided.

14 MR. KEVIN O'REILLY: Thanks. Kevin  
15 O'Reilly, with the Monitoring Agency. Yeah, we  
16 understand that process well, Eric, and we've  
17 participated in it.

18 I guess, though, the issue here is, Is  
19 this something that the Review Board should be flagging  
20 for the Wek'eezhii Land and Water Board in terms of  
21 giving some guidance, or even some direction to the  
22 Company as to where monitoring of the waste rock pile  
23 should take place? So I guess that's the issue.

24

25 (BRIEF PAUSE)

1 MR. RICHARD BARGERY: Richard Bargery,  
2 Dominion Diamond. I -- I -- the way it was phrased,  
3 anyway, I think that's a question for the Board, you  
4 know.

5 MR. MARK CLIFFE-PHILLIPS: Mark  
6 Cliffe-Phillips, with the Review Board. As we  
7 mentioned yesterday, for registry items that are being  
8 referenced by the Company, there's opportunities for  
9 the Company to submit that to the registry. Other  
10 parties also have the opportunity to submit documents  
11 that are on a public registry for the WW -- WLWB, or --  
12 or any other relevant materials you could submit to the  
13 Board, and the Board would post that onto the registry.  
14 People could comment on the relevancy and application  
15 after that time.

16 MR. KEVIN O'REILLY: Thanks. Kevin  
17 O'Reilly, with the Agency. I guess -- I don't want to  
18 drag this out any longer than it needs to be, but DDC  
19 could also make a commitment to ensure that there's  
20 adequate thermistors placed in -- on that side of the  
21 waste rock pile to make sure that permafrost  
22 encapsulation takes place. So you can make a  
23 commitment, as well. You don't have to wait for the  
24 Review Board.

25 MR. RICHARD BARGERY: Richard Bargery,

1 from Dominion Diamond. I -- we take the point, I  
2 guess. That's -- that's what I'd say at this point.

3 THE FACILITATOR: Okay, thank you.

4 Could we have the agenda back on the screen to help my  
5 memory with where we are right now? We're still on  
6 site water management, and we've dealt with the waste  
7 rock storage area seepage. So now we're moving on the  
8 effects of wet and dry climate.

9 We've had a bit of a discussion on one  
10 (1) aspect of wet and dry years, but I wonder if there  
11 are questions related to site water management,  
12 specifically on the effects of wet and dry climates?

13 MR. NEIL VAN DER GUGTEN: Neil van der  
14 Gugten. My -- my understanding is, and please --  
15 please, confirm or correct me if I'm wrong, but the  
16 only water management component that seems to be sized  
17 for anything other than average climate and runoff  
18 conditions, that I could find, is the Jay runoff sump.  
19 And it is -- it has excess capacity to handle a single  
20 twenty-four (24) hour one (1) in ten (10) rainfall  
21 event.

22 Other than that, I'm not aware of -- of  
23 any other components that are designed or the -- where  
24 contingencies have been planned or provided for wet  
25 years or sequences of -- of wet years over the -- that

1 are reasonably probable over the life of the project.

2 Thank you.

3

4 (BRIEF PAUSE)

5

6 MS. FIONA ESFORD: Fiona Esford, of  
7 Golder Associates. Just for clarification first,  
8 you're referring to the water management aspects and --  
9 and not so much the sub-basin B diversion channel. Is  
10 that correct?

11 Fiona Esford, of Golder Associates. The  
12 water management structures, the sumps are internal  
13 within the diked area. And so that itself, along with  
14 the Jav pit and the Miserv pit, have sufficient  
15 capacity themselves with freeboard to tolerate those  
16 cycles.

17 THE FACILITATOR: It's Bill Klassen.  
18 Are there further questions on this topic?

19

20 (BRIEF PAUSE)

21

22 THE FACILITATOR: Is there anyone --  
23 sorry, I've got -- thank you. Go ahead.

24 MR. NATHEN RICHA: Thank you. It's  
25 Nathen Richa, Water Resources Division, ENR. I was

1 iust going to follow up on a previous conversation that  
2 I mav have missed. But I think there was some  
3 conversation before the break about the potential for  
4 drv years affecting water levels between Lac du Sauvage  
5 and Lac de Gras. And an important component of that  
6 would be the narrows between the two (2) lake svstems.

7 And I think there was a question to the  
8 Operator on what the potential water level would be,  
9 the minimum water level to allow at least a connection  
10 between Lac du Sauvage and Lac de Gras. And I think  
11 it's relevant here, again, because of the effect of wet  
12 and drv years on the operation.

13 And I'm iust wondering if there's  
14 something that can be revisited on that discussion  
15 point. I think it's important. It's important from  
16 and assessment standpoint in trving to determine  
17 whether if a certain water level would be -- cause an  
18 impact to the narrows if it was drawn down through a  
19 series of wet or drv years, probably the drv more so  
20 would be a concern, during the course of the operation.

21 So I'm iust wondering if we could  
22 revisit that discussion and -- and mavbe come up with  
23 some sort of resolution to, sort of, that component?

24 MS. SACHI DE SOUZA: Yeah, so Sachi De  
25 Souza, with the Board. That's -- that's right now an -

1 - an undertaking. I'll let you guys...

2

3 (BRIEF PAUSE)

4

5 MR. RICHARD BARGERY: Richard Bargery,  
6 Dominion Diamond. So I -- I think we've made an  
7 undertaking -- a homework assignment, and under -- one  
8 (1) -- some -- one (1) of those things. I can't  
9 remember what we -- what we said for that particular  
10 one about the minimum -- minimum levels in -- in the  
11 narrows during backflooding, which would be the only  
12 time we would be using and drawing water.

13 MR. NATHEN RICHEA: Okay. Thank you.  
14 It's Nathen Richea, with Water Resources. I must have  
15 missed that part, because I thought there was no  
16 resolution to that point. So I apologize.

17 THE FACILITATOR: It's Bill Klassen.  
18 Are there other questions then related to wet -- wet  
19 and -- the effects of wet and dry climate on, let's  
20 say, water management. Are there any questions on --

21 MR. NEIL VAN DER GUGTEN: Neil -- Neil  
22 van der Gugten. Yes, I just have one (1) more  
23 question.

24 THE FACILITATOR: Yes.

25 MR. NEIL VAN DER GUGTEN: And this

1 relates to information in the Mine Water Management  
2 Plan, Appendix E, where there's a table of a water  
3 balance model input parameters. It's Table B3. And I  
4 just request a clarification on that table, the first  
5 row. It talks about precipitation and it talks about  
6 precipitation from October to May stored and released  
7 in June over a period of one (1) month. So I  
8 understand that is the snowfall accumulation which  
9 melts in June. And then it says:

10 "Equivalent to a 33 percent runoff  
11 coefficient under average  
12 conditions."

13 And I'm not sure what that means. Could  
14 you explain that please?

15 MR. RICHARD BARGERY: Richard Bargery,  
16 Dominion Diamond. For those on the phone, we'll just  
17 take a moment to -- to look up that specific table.

18

19 (BRIEF PAUSE)

20

21 MR. RICHARD BARGERY: Richard Bargery,  
22 Dominion Diamond. I don't think we have the right --  
23 the right person here to -- to give that answer  
24 quickly. So we'll -- we'll contact that person and --  
25 and get an answer -- answer for you on that specific

1 question.

2 MR. NEIL VAN DER GUGTEN: Neil van der  
3 Gugten. Thank you. And just one (1) more item on the  
4 table. Under runoff coefficient for undisturbed area,  
5 it says point seven (.7) -- zero point seven (0.7) for  
6 June and point five seven (.57) from July to September.  
7 So I'm assuming the point seven (.7) in June again  
8 refers to snow melt runoff.

9 So I'm wondering how that number  
10 compares to the 33 percent mentioned just a moment ago  
11 and how -- why that is different from the one point  
12 zero (1.0) runoff coefficient for the regional model.  
13 Thank you.

14 MR. RICHARD BARGER: Richard Barger,  
15 Dominion Diamond. Okay. We'll -- we'll add that. So  
16 we'll get back to you on -- on the table, hopefully in  
17 -- in the morning.

18 MS. SACHI DE SOUZA: Okay. So the  
19 homework question is to clarify values in Table B3,  
20 from Appendix 3A from the DAR.

21 THE FACILITATOR: It's Bill Klassen  
22 again, on -- on the topic of wet and dry climates and  
23 the effects on site water management. If there aren't  
24 any more questions on that, or at least generally, then  
25 I'll ask Sachi to -- to ask a question and move us into



1 the next topic.

2

3 (BRIEF PAUSE)

4

5 MS. SACHI DE SOUZA: It's Sachi De  
6 Souza, with the Board. Before -- before moving  
7 directly into the -- the conversation of the effect of  
8 wet and dry years, I want to have a conversation about  
9 the site water balance model for the Jay project. And  
10 part of it stems from how climate was considered in the  
11 model. And part of it is related to the output from  
12 the -- the water balance model. So I'll put this up to  
13 start.

14 The first question -- so the first  
15 question I have is: Were standalone models done for  
16 the Jay project and is there a standalone water balance  
17 model for the site? And this relates to MVEIRB's IR  
18 number 5. And I guess my overall goal of this line of  
19 questioning is to understand the accuracy of the water  
20 balance model and the accuracy of the predictions to  
21 understand the effects for storage and the effects  
22 downstream.

23

24 (BRIEF PAUSE)

25

1 MR. RICHARD BARGERY: Richard Bargery,  
2 Dominion Diamond. Could -- Sachi, could I ask you just  
3 to restate your question, and -- and particularly the  
4 part about the accuracy and -- and what exactly you're  
5 looking for there?

6 MS. SACHI DE SOUZA: Sachi De Souza,  
7 with the Board. I, in trying to review the -- the  
8 water balance model, didn't have a water balance model  
9 to actually look at. I have responses from (sic) the  
10 Water Management Plan and responses to the IR. And I  
11 was -- I was hoping through the IR to actually get the  
12 standalone water balance model.

13

14 (BRIEF PAUSE)

15

16 MS. SACHI DE SOUZA: If I -- I'm just  
17 going to interrupt and maybe this will help a bit more.  
18 So one (1) of the reason I had -- I have the questions  
19 I have is in the Site Water Management Plan -- this is  
20 Appendix 3A -- you provided the Misery pit outflows and  
21 volumes for the water balance model.

22 So on this blue line, you -- this is the  
23 Misery pit volume, and the green and the red lines  
24 represent flow rates, so the green lines being what's  
25 being pumped to Lac du Sauvage, and then later what's

1 being pumped from the Miserv pit to the Jav runoff  
2 sump.

3 One (1) of my points of confusion is  
4 that my understanding is that the duration for this red  
5 line should match the duration from this drop of the  
6 blue. The drop in the Miserv pit volume should match  
7 the point -- the -- the time that water is being pumped  
8 out of the Miserv pit into Lac du Sauvage -- into the  
9 Jav pit diked area for closure.

10 And I'm confused about why the durations  
11 don't line up.

12

13 (BRIEF PAUSE)

14

15 MR. RICHARD BARGERY: Richard Bargery,  
16 Dominion Diamond. I think that's going to -- Mike  
17 tells me it's -- it's going to just take a little bit  
18 of time and it's going to require referencing a number  
19 of things to -- to answer the specific question about  
20 why the difference here.

21 So it may be tomorrow morning that --  
22 that -- once we have the chance to -- to deal with the  
23 various reference -- documents. So that's going to  
24 have to be -- one (1) sec.

25 THE FACILITATOR: It's Bill Klassen,

1 Richard. Are you saying that you need some time right  
2 now and you can do it, or you need more time than --

3 MR. RICHARD BARGERY: Richard Bargery.  
4 And the table number would be helpful here, the -- the  
5 figure number.

6 MS. SACHI DE SOUZA: It's Sachi De  
7 Souza, with the Board. So I'm looking for a  
8 clarification on Figure 6-3 and also on Figure 6-6 -- I  
9 can get there very slowly -- that are in the Appendix  
10 3A to the DAR, the Site Water Management Plan.

11 I have questions about the fact that the  
12 duration of the pumped outflows don't match the  
13 increases or decreases in the observed volume or  
14 storage volume in both the Miserv pit and the Jav dike  
15 dock area.

16

17 (BRIEF PAUSE)

18

19 MR. RICHARD BARGERY: Richard Bargery,  
20 Dominion. That's -- I think we've got the clarity in  
21 terms of the -- the question. And -- and we're going  
22 to have to go back to the water balance model and --  
23 and come back with an answer on that.

24

25 (BRIEF PAUSE)

1 MS. SACHI DE SOUZA: Okav. Sachi De  
2 Souza, with the Board. Sticking with the overall site  
3 water balance, it would also be useful for the Board's  
4 understanding of the operations to understand if there  
5 is sufficient capacity within the LLCF to manage the  
6 predicted long -- or the expansion, and there's no  
7 indication from the information provided yet that there  
8 is that capacity with the water management structures  
9 at the main camp.

10 Is there data to prove that, or  
11 modelling to confirm that?

12

13 (BRIEF PAUSE)

14

15 MR. ERIC DENHOLM: It's Eric Denholm  
16 speaking. So in that -- regarding the LLCF, you -- we  
17 -- we know it's -- it's -- the -- the fine processed  
18 kimberlite in slurry is going to the Panda/Koala pits  
19 for the duration of the Jay project. So the capacity  
20 you're interested in -- you're asking about is -- is  
21 capacity for -- for the -- for water, or I'm -- just --  
22 maybe you can clarify.

23 What -- what capac -- just which -- in -  
24 - in light of this -- they -- you -- you -- in light of  
25 the -- there's no fine processed kimberlite going to

1 the LLCF through the Jay project, what's the capacity  
2 that you're interested in?

3 MS. SACHI DE SOUZA: Sachi De Souza,  
4 with the Board. For the processing facility, and maybe  
5 I don't understand this very well because I haven't  
6 seen the detailed water balance, you will process the  
7 ore. There will be a waste stream from the processing  
8 plant. One of it will -- one line of that waste stream  
9 is the fine processed kimberlite.

10 Is another waste stream -- is there a  
11 separate waste stream for waste water, or processed  
12 water that gets sent to the LLCF, or is there just one  
13 (1) process stream?

14 MR. ERIC DENHOLM: It's Eric Denholm  
15 speaking. So, yes, there's -- there's only the one (1)  
16 -- there's only the one (1) pro -- exit from the  
17 process plant. And we call it the slurry, so it's got  
18 the fine processed kimberlite solids and the processed  
19 plant water all mixed up together in that, so there's  
20 only one (1).

21 MS. SACHI DE SOUZA: Okay. Sachi De  
22 Souza, with the Board. The plan to -- to put the fine  
23 processed kimberlite slurry into the mined out pits is  
24 reliant on the success of the Bear Tooth -- what's  
25 currently being done with putting FPK into the Bear

1 Tooth pit.

2                   So what will happen if -- first of all,  
3 when will there be confirmation that Bear Tooth is  
4 successfully completing this job, and it will  
5 successfully create a meromictic zone and it will be  
6 okay for closure, and is there a time frame for -- for  
7 that information?

8                   And second of all, if it doesn't prove  
9 to work, what is the contingency plan for the fine  
10 processed kimberlite?

11

12                   (BRIEF PAUSE)

13

14                   MR. ERIC DENHOLM:    Yeah, it's Eric  
15 Denholm speaking.    So -- so Bear Tooth -- Bear Tooth  
16 pit is -- is kind of -- it's -- it's more than -- it's  
17 -- it's much more than a demonstration project, but it  
18 is something we -- we do refer to as -- as an example  
19 of -- of a successful project for putting fine process  
20 kimberlite into a mined out open pit.

21                   I don't think we were relying on some  
22 kind of measurement of success in Bear Tooth pit. I  
23 think we would say Bear Tooth pit is working well.  
24 It's -- it's going -- what we -- and what I mean by  
25 that is it -- the fine processed kimberlite is going

1 in. It clarifies. We're in the process of pumping  
2 some mine water out over to the LLCF, all according to  
3 the plan for the use of Bear Tooth pit in this manner.

4 So I think we'd suggest that Bear Tooth  
5 pit is, you know, a effective and successful  
6 demonstration project. Again with the qualifier, it  
7 was much more important to Ekati than as a  
8 demonstration project, but -- so we're not relving on  
9 it and not looking to some future demonstration of  
10 success in Bear Tooth to -- to validate the use of  
11 Panda-Koala.

12 MS. SACHI DE SOUZA: Sachi De Souza,  
13 with the Board. So...

14

15 (BRIEF PAUSE)

16

17 MR. KEVIN O'REILLY: Thanks. Kevin  
18 O'Reilly, for the Agency. I just wanted to follow up  
19 on this line of questioning. I don't think we've  
20 actually seen any water quality results from Bear  
21 Tooth. And I think you may have had one (1) season,  
22 maybe, of some sampling. I know there was some  
23 difficulties in getting down the ramp into the -- the  
24 pit to actually take water samples.

25 But we -- we -- I don't believe we've



1 actually ever seen any water quality results from Bear  
2 Tooth. You know, are you measuring what kind of depth  
3 profile and no results -- if -- if those sort of  
4 results were available, it would be really helpful.  
5 And maybe you could file them with the -- the Review  
6 Board. Thanks.

7

8 (BRIEF PAUSE)

9

10 MS. CLAUDINE LEE: Hi. Claudine Lee,  
11 Dominion Diamond. Kevin, Bear Tooth pit is an SNP  
12 sample in the new water licence. So the requirement is  
13 to sample under ice and open water. And that's  
14 reported in the SNP. It was sampled in June, I think.  
15 Don't quote me on that, but it was sampled this year  
16 open -- open water, so that'll be in the -- in the SNP  
17 report.

18

19 (BRIEF PAUSE)

20

21 MS. SACHI DE SOUZA: Sachi De Souza,  
22 with the Board. I'm going to leave questions about the  
23 LLCF for now and move back just to the site water  
24 balance model. So in the site water balance model you  
25 use the EA case for groundwater inflows, which is a

1 conservative estimate for groundwater inflows, and you  
2 used an average rainfall.

3                   Earlier in the day during the  
4 hydrogeology presentation you mentioned that if you  
5 changed the zone for the -- the groundwater model, it  
6 could potentially reduce the groundwater inflows by  
7 about 25 percent. Reducing the groundwater inflows by  
8 25 percent would -- would bring you closer in your  
9 water balance, from my calculations, to something  
10 closer to a fifty (50)/fifty (50) breakdown between  
11 surface water runoff contributions and groundwater  
12 contributions.

13                   My concern with the conservative  
14 approach for the groundwater modelling and for using  
15 average climate in the water balance model is that  
16 there's the potential that everything has been  
17 overestimated in terms of quantity. So if you've over  
18 estimated the groundwater flows, if you've  
19 overestimated the surface water runoff, what could  
20 potentially happen, and I don't have the water balance,  
21 I haven't -- I haven't seen the numbers on it, is you  
22 might be overestimating the total wat -- water that  
23 needs to be treated.

24                   In the long term what that could mean  
25 is, A) you have a different TDS concentration

1 predictions. And the presentation has shown that you'd  
2 still get meromixis with the range of TDS volume --  
3 concentrations, so I appreciate that.

4 But what would happen if you have  
5 overestimated this and is there pot -- the potential --  
6 that you would potentially need, sorry, a -- a larger  
7 freshwater cap. So you would need to pump more water  
8 from Lac du Sauvage into the Misery pit, into the  
9 closed off Jav pit, because you've overestimated the  
10 amount of water you need.

11 And that relates back to the earlier  
12 question of the backflooding timing and protection of  
13 the threshold to come for protection of the Lac du  
14 Sauvage narrows.

15

16 (BRIEF PAUSE)

17

18 MR. RICHARD BARGERY: Sorry -- Richard  
19 Bargery, Dominion Diamond. Sorry, Sachi, but there's a  
20 number of questions in there in the -- in -- in what  
21 you just said. And we'd like to break them down on an  
22 individual basis and -- and try to answer them that  
23 way.

24 Can you just go through, starting with -  
25 - with question 1, and -- and we'll sort of answer in -

1 - in sequence here?

2 MS. SACHI DE SOUZA: Sachi De Souza,  
3 with the Board. I think the -- the one (1) question  
4 that maybe -- the big question is: Is there the  
5 potential that the modelling has overestimated the  
6 amount of water to come in that needs to be managed?  
7 And would that potentially change, as a result, the  
8 amount of water during closure that is needed to form  
9 the fresh water caps for Misery and Jay pits?

10

11 (BRIEF PAUSE)

12

13 MS. FIONA ESFORD: Fiona Esford, Golder  
14 Associates. I'm going to answer the first part of your  
15 question and Mike will answer the second part. So in  
16 terms of have we potentially overestimated the total  
17 volume combination of groundwater and surface water to  
18 be managed as part of the overall water management pro  
19 -- program. That is possible and that would just  
20 ultimately delay when we initially begin discharge into  
21 Lac du Sauvage.

22 But the -- the Misery pit will still  
23 fill. It's just maybe instead of being similar to what  
24 we saw in the conservative -- the DAR assessment case  
25 versus the reasonable estimate case, there was a one

1 (1) year delay. Maybe there's a year and a half delay.  
2 It's still going to occur.

3 MR. MICHAEL HERRELL: It's Mike  
4 Herrell, from -- for -- for Golder Associates. So as  
5 Fiona indicated the pit will fill and we've run two (2)  
6 sensitivities. One (1) the conservative EA case and  
7 also the -- the reasonable estimate case. And  
8 throughout the -- the life-of-mine the pit will fill  
9 and discharge. And that won't change the closer -- the  
10 Closure Management Plan which is to pump the upper 50  
11 metres because there's 10 metres of free board in there  
12 over to the Jav pipe and leaving capacity for -- for 60  
13 metres of storage in Miserv pit. So the volume of  
14 water that will be pumped from Lac du Sauvage into  
15 Miserv at closure will be the same volume of water  
16 that's required.

17 MS. SACHI DE SOUZA: Okay. We'll leave  
18 it there. It's Sachi De Souza, with the Board. In the  
19 interest of time, I think we should be -- start -- we  
20 should start discussing water quality predictions into  
21 the downstream environment and closure predictions  
22 through meromixis and the pits.

23 Sachi De Souza, with the Board. And  
24 also the -- the topic of -- of contingency storage and  
25 treatment. There was a number of IRs related to that.

1 MS. MEAGAN TOBIN: All right. Meagan  
2 Tobin, with Environment Canada. If that's -- take the  
3 heat off these guys a bit. So my first question is  
4 regarding the phosphorous guideline that was used,  
5 which was the mesotrophic to miso-eutrophic guideline,  
6 according to CCME.

7 So although we acknowledge that the  
8 natural variability within Lac du Sauvage causes  
9 difficulty in setting this guideline or the trigger  
10 value, Lac du Sauvage is still classified by several  
11 measurement methods as an oligotrophic lake and should  
12 remain as such.

13 And so we understand that, given the EA  
14 estimate cases, the phosphorous concentrations are  
15 likely overestimated. So the guideline of 20  
16 micrograms per litre is just far too high for our  
17 comfortable -- comfort.

18 So based on the CCME guidance of the  
19 trigger ranges, which is oligotrophic, as well as the  
20 CCME guidance of the 50 percent baseline rule where if  
21 in exceedance of 50 percent of the baseline, then it  
22 warrants further investigation, both leaves the  
23 guideline concentration at the 10 microgram per litre  
24 area.

25 So I don't know if you wanted to comment

1 on that. I don't have a direct question other than we  
2 see the 20 microgram per litre as just far too high.

3

4 (BRIEF PAUSE)

5

6 MR. JOHN FAITHFUL: It's John Faithful,  
7 from Golder Associates. We've -- we've given a lot of  
8 thought to -- to the way that we've evaluated the --  
9 the potential trophic shift. We don't -- we don't  
10 disagree with the fact that, for -- for all intents and  
11 purposes, Lac du Sauvage does exhibit all the  
12 characteristics of oligotrophic lake. It has a low  
13 productivity.

14 We do also acknowledge that there is  
15 quite a -- a wide temporal and spatial total  
16 phosphorous concentration that -- that has been  
17 measured in the lake over the -- over the period of  
18 time that we've tried -- looked at -- looked at  
19 existing data to -- to characterize the reference  
20 condition.

21 And it's primarily that part -- that --  
22 that point that, although the -- the mean concentration  
23 is -- is somewhere -- it's around 6 to 7 micrograms per  
24 litre, that -- that you do get that occasional shift to  
25 -- to 18 micrograms per litre I think was the -- was

1 the maximum concentration.

2                   Nevertheless, when we -- when we look at  
3 the model predictions and we -- we establish what we  
4 consider are the maximum predicted concentrations of, I  
5 think, 12 micrograms per litre as a -- particularly  
6 under ice con -- conditions, it's still within that --  
7 that overall range of concentrations.

8                   And on evaluation from a lower trophic  
9 and plankton point of view, that low productivity still  
10 -- still remains. And our position is that setting  
11 that -- that screening value or that benchmark of -- as  
12 the upper bound of -- of mesotrophic is -- is still  
13 appropriate.

14

15                   (BRIEF PAUSE)

16

17                   THE FACILITATOR: Do you have a -- a  
18 follow-up question to that? Okay. Thank you.

19

20                   (BRIEF PAUSE)

21

22                   MS. MEAGAN TOBIN: Meagan Tobin, with  
23 Environment Canada. I guess our concern with setting  
24 the value so high is that a shift to that level and  
25 having just the basic guideline at 20 micrograms per



1 litre would cause a significant shift before any  
2 impacts would even need to be assessed, or evaluated.

3                   So, I mean, we -- the difficulty with  
4 Lac du Sauvage is that it does have -- I think about 5  
5 percent of the time does jump into that mesotrophic  
6 range. However, it is not near the meso-eutrophic. So  
7 twenty (20) is too high. We understand the  
8 difficulties with ten (10).

9                   If we could -- the -- just -- the  
10 guideline as it stands is just -- it allows for too  
11 much of a almost pollute up to.

12                   DR. KATHY RACHER: Kathy Racher, for  
13 the Board. If I may, I think what Environment Canada  
14 is talking about is -- is using the 10 micrograms per  
15 litre as a -- as a water quality objective as opposed  
16 to using 20 micrograms as a water quality objective.  
17 In your -- in the DAR, you used twenty (20) as a  
18 screening value to sort of see, you know, is this -- is  
19 this an area of a -- of a big effect, and -- and your  
20 conclusion was that it was not, because there is a -- a  
21 -- it's close to the nature range of variability --  
22 variability.

23                   But I -- I guess the question really is,  
24 Would you agree that going forward, that the -- the  
25 appropriate water quality objective for phosphorus

1 would be ten (10), not twenty (20)?

2 MS. MEAGAN TOBIN: And -- Meagan Tobin,  
3 Environment Canada -- to elaborate on that slightly,  
4 Environment Canada would be comfortable with the median  
5 -- the median staying under that 10 micrograms per  
6 litre.

7

8 (BRIEF PAUSE)

9

10 MR. JOHN FAITHFUL: It's John Faithful,  
11 for Golder Associates. I think we -- we've got to keep  
12 sight also that we're -- we're still in the -- the DAR  
13 evaluation process where we've set the -- the -- I  
14 guess the screening level for total 'P' is the upper  
15 bound of -- of mesotrophic really takes into account  
16 what we've seen with regard to the -- the natural  
17 variability within the Lac du -- du Sauvage system.

18 We still have evaluated the -- the  
19 duration by which we do see increases in -- in  
20 phosphorus within Lac du Sauvage. We've been able to  
21 apply what that change potentially can mean with expect  
22 to lower trophic organisms and plankton, and as such,  
23 for this -- for the EA process, or this DAR process,  
24 we're still comfortable with the fact that we've set  
25 our -- our sort of initial screening value as twenty

1 (20), because it does cover off the natural variability  
2 of the -- of the total phosphorus concentration that  
3 we're predicting for that five (5) year to six (6) year  
4 discharge period into Lac du Sauvage.

5 DR. NEIL HUTCHINSON: Neil Hutchinson,  
6 for the Board. I -- I would just like to challenge and  
7 disagree with your conclusion, that a natural  
8 variability in which only 5 percent of the measurements  
9 that you've made exceed 10 micrograms per litre  
10 classifies a lake as mesotrophic. Classifications are  
11 done on central tendency on medians and means, and not  
12 by the more extreme values that you prefer.

13 I -- I think what -- what we're a bit  
14 concerned here is that setting the screening level says  
15 it's okay to get up to twenty (20), because as long as  
16 you're within twenty (20), you haven't violated any of  
17 the EA predictions, should the predictions prove wrong.  
18 And we've seen experience already with Snap Lake where  
19 EA predictions turned out not to be met, and we had to  
20 reopen the EA process to define it, if the screening  
21 level was appropriate or not.

22 And the Board is concerned that if we  
23 set twenty (20) as the screening level here, that's  
24 going to allow a radical change in a lake that's  
25 currently at 6 or 7 micrograms. And I'd point out that

1 your predictions of 12 micrograms are maximum values.  
2 They're not median values, and they only occur in the  
3 under-ice season. So we don't see much risk, actually,  
4 in calling the lake for what it is.

5 MR. BARRY ZAJDLIK: Barry Zaidlik, on  
6 behalf of GNWT. If I could add to Neil's comment?

7 THE FACILITATOR: Could you hold your  
8 comment for just a moment, and then we'll... Okay. Go  
9 ahead with your comment, and then Dominion Diamond can  
10 respond.

11 MR. BARRY ZAJDLIK: Barry Zaidlik, on  
12 behalf of GNWT. Measures of central tendency are only  
13 one (1) thing to consider when we're looking at things  
14 that either biomagnify our nutrients. Another  
15 consideration is loadings. A small incremental change  
16 in the measure of general tendency will lead to massive  
17 changes in loadings over the course of five (5) years,  
18 and I think we also have to consider loadings as part  
19 of the -- the screening criterion here.

20

21 (BRIEF PAUSE)

22

23 MR. JOHN FAITHFUL: John Faithful,  
24 Golder Associates. I think one (1) -- one (1) area  
25 that we want to sort of confirm is that even though

1 that we've set a -- a screening value and I've -- I've  
2 provided a -- a rationale for -- for why we've -- we've  
3 set 20 micrograms per litre as our initial screening  
4 value, but we haven't indicated that -- that we think  
5 that Lac du Sauvage is a mesotrophic lake, nor will it  
6 be mesotrophic at the -- as a result of the -- of the  
7 project.

8                   We do see -- take -- take Neil's point  
9 that with respect to -- to our predictions over that  
10 short discharge period, that under-ice conditions do  
11 show peak concentrations of 12 -- 12 micrograms per  
12 litre. But again, it's -- it's really how we've set  
13 the process in terms of screening.

14                   The expectations are that the -- the  
15 concentration will remain will -- are not expected to -  
16 - to exceed 12 micrograms per litre. Also, taking into  
17 account the factors that I made in the presentations  
18 earlier about the over-conservatism of 'P'. It's --  
19 it's really on the basis of how we've addressed the  
20 screening process for the predictions for phosphorus in  
21 the receiving environment.

22                   THE FACILITATOR: We still have a  
23 number of topic headings on the agenda to get through,  
24 but I will just continue to ask for questions related  
25 to -- we've got capacity contingency and safety

1 factors, but -- and then next after that, discharge  
2 timing and quality. But I see there is a question.  
3 Please, your name.

4 MR. RICK WALBOURNE: Rick Walbourne,  
5 GNWT. I have a question on the contingency aspect. I  
6 believe it was on slide 5 of the -- Dominion's  
7 presentation, if you want -- if you want to pull that  
8 up. And it was in response to GNWT IR58.

9 Several contingency options were  
10 outlined, King Pond, Misery pit, Lynx pit. I'm trying  
11 to condense this into one (1) question. I have five  
12 (5) or six (6), but I guess basically, could Dominion  
13 provide a total capacity of those contingency areas,  
14 should it be required? And the list, again, is on  
15 slide 5, I think.

16

17 (BRIEF PAUSE)

18

19 MR. RICHARD BARGERY: Richard Bargery,  
20 Dominion Diamond. So King Pond is 1 million cubic  
21 metres, Misery 3 million, and Lynx is five point two  
22 (5.2). So those are the -- the largest, the majority,  
23 which is what nine point two (9.2)?

24 MR. JOHN FAITHFUL: Yeah.

25 MR. RICK WALBOURNE: Rick Walbourne,

1 GNWT. I have a follow-up on that. But you did also  
2 mention, I think, in your response that there was  
3 potentially the use of a storage capacity site  
4 available at the Ekati site.

5 Was that also an option, and what  
6 specifically were you referring to there? I -- Koala  
7 or Panda, or -- or what was that referring to?

8

9 (BRIEF PAUSE)

10

11 MS. FIONA ESFORD: Fiona Esford, Golder  
12 Associates. Yes, we were referring to the other pits  
13 within -- at the main Ekati site as providing further  
14 capacity.

15 MR. RICK WALBOURNE: Thanks for that  
16 response. Rick -- Rick Walbourne, GNWT. I guess what  
17 I'm trying to get at, I'm trying to get an  
18 understanding of total capacity in the event that water  
19 quality predictions in the Misery pit were higher than  
20 anticipated. I'm trying to then convert that capacity  
21 into what kind of timelines do you anticipate that you  
22 would be able to store water, if required. Months? A  
23 year? I guess, whatever your total capacity is divided  
24 by your daily inflow into Jav, or whatever -- whatever  
25 the factor might be. I'm trying to get an

1 understanding of total time that you can store water.

2 Thanks.

3

4 (BRIEF PAUSE)

5

6 MS. FIONA ESFORD: Fiona Esford, Golder  
7 Associates. The first point is that we've been very  
8 conservative in our estimates of the volume and water  
9 quality as discussed previously today. The capacity  
10 and what we would do for contingency measures depends  
11 on the situation that would arise and -- and what  
12 volume or -- or condition was required.

13 Fox, for instance, has 80 million cubic  
14 metres of capacity. The 3 million additional capacity  
15 or the freeboard capacity within Miserv gives us six  
16 (6) months additional storage capacity for the DAR  
17 assessment case.

18 MR. RICK WALBOURNE: Rick Walbourne,  
19 GNWT. Thanks for that answer. I had got a couple more  
20 questions on -- on some of those areas, specifically  
21 Lvnx pit. I'm assuming that would be filled after  
22 dewatering of the Jav area. You mentioned 5.2 million  
23 capacity which I think is the total capacity of Lvnx  
24 pit which would mean it would have to be dewatered.

25 At what point after filling of Lvnx



1 would it be possible that that could be dewatered? I  
2 know there's going to be high TSS in there originally.  
3 What timeline do you anticipate that water could be  
4 dewatered from Lvnx to make it available for Miserv?

5

6 (BRIEF PAUSE)

7

8 MS. FIONA ESFORD: Fiona Esford, Golder  
9 Associates. As part of the back-flooding of Lvnx,  
10 we're not filling it with the dewatered high 'T' --  
11 total suspended solid water right to the crest.  
12 There's a portion that's left for natural seepage and -  
13 - and runoff to come into Lvnx pit, and that's  
14 estimated to be two and a half (2 1/2) to three (3)  
15 years before Lvnx pit would naturally discharge to the  
16 environment.

17 Obviously monitoring would occur during  
18 that before discharge would occur but the total  
19 suspended solids from the dewatering is estimated to  
20 settle well before that two and a half (2 1/2) year  
21 period, and -- and well before Miserv pit would come  
22 anywhere close to capacity.

23 MR. RICK WALBOURNE: Rick Walbourne,  
24 GNWT. Thanks for that response. I've another question  
25 in that regard. Regarding the use of Lvnx pit or

1 existing mine sites on the Ekati site, does the project  
2 anticipate any implications on closure options for  
3 those pit lakes that there are proposed to be in the  
4 future? And, as such, do they anticipate any  
5 implications to existing water licences for the Ekati  
6 site that may require amendments as a result of  
7 contingency plans related to the Jay project?

8

9 (BRIEF PAUSE)

10

11 MR. ERIC DENHOLM: It's Eric Denholm  
12 speaking. So I -- so if we were to use as -- as  
13 adaptive management, future adaptive management sort of  
14 response, the pits, you know, in this manner,  
15 regardless of -- of the actual use of the pits in those  
16 matters, I think I'd say the -- any water that ultimate  
17 would -- for closure, that would be released from those  
18 pits is going -- it will -- would have to -- it already  
19 and would remain having to meet criteria defined in the  
20 water licence. That wouldn't change. That's already  
21 the case for the open pits. I wouldn't see that that  
22 would change if we had incorporated the pits into a --  
23 an adaptive management response in some way.

24 DR. KATHY RACHER: Kathy Racher, for  
25 the Board. Rick, we were just wondering how many more

1 questions you have in -- in this vein? We have a lot  
2 to -- a lot to do by the end of the day, so.

3 MR. RICK WALBOURNE: Rick Walbourne,  
4 GNWT. That was the last question, but I -- I don't  
5 think that was the response I was -- I was looking for.  
6 I wasn't -- yeah. I had asked earlier about water  
7 coming from Lynx and TSS. Now I was kind of -- the  
8 question was regarding closure options for those lakes  
9 if they were to be filled with -- say Lynx, for example  
10 -- with water from dewatering of Jay, which could be  
11 high TSS which would settle out.

12 If now we're potentially filling that  
13 with high total dissolved solids water from Misery pit,  
14 it changes the -- I guess the closure of those pits.  
15 Similarly, the -- the pits on the Ekati site, if they  
16 were pit lakes just going to be refilled from Lac de  
17 Gras or Lac du Sauvage and either being filled with  
18 highly salty water from Misery and -- which came from  
19 Jay, my question was:

20 Does that then change closure options  
21 for those lakes that may have been said to become pit  
22 lakes, for instance? Would the water quality then be  
23 altered and we would have to revisit closure options  
24 for those other pits?

25 My other question was regarding

1 regulatory implications from the existing Ekati licence  
2 that may result from the use of those pits as -- as  
3 water management ponds related to the Jav pit.

4                   So there were two (2) questions there  
5 that I don't think were answered. And that -- those  
6 are my last questions, if they're responded to.

7

8                   (BRIEF PAUSE)

9

10                   MR. ERIC DENHOLM: Okay. Yeah, it's  
11 Eric Denholm speaking. Thanks for the clarification,  
12 Rick. So again, just -- just to reset, if -- if I  
13 could, the context a little bit. We're talking -- you  
14 know, we've done -- as we say, conser -- what we think  
15 are conservative estimates of -- of the -- the water  
16 quality and quantity that would be going into Miserv  
17 pit, and the Mine Water Plan accommodates that. And so  
18 we're -- we're discussing conceptual possible future  
19 adaptive management responses that we -- we don't  
20 expect to actually be doing.

21                   However, take -- your point taken. The  
22 nature of adaptive management responses, if we don't  
23 know right now what that might look like, they're  
24 designed at the time to deal with the situation that's  
25 -- that's at hand. So, conceptually, if the -- some of

1 these other pits were used as part of an adaptive  
2 management response in this manner, conceptually that -  
3 - that could have implications for the closure  
4 measures.

5 And if that were to be the case, as is -  
6 - as is already the established framework, that would -  
7 - the adaptive response plan and including any  
8 implications that it might have for closure of those  
9 pit lakes, would go to the Wek'eezhii Land and Water  
10 Board for its approval.

11 MR. RICK WALBOURNE: Rick Walbourne,  
12 GNWT. Yeah, thanks for that response. I think we'll  
13 leave it there for now.

14 THE FACILITATOR: Okay. Thank you.  
15 It's Bill Klassen. Neil Hutchinson has indicated that  
16 he has a question. We -- we still have a number of  
17 topics to cover, and we've got, by my watch here, an  
18 hour and ten (10) minutes to go, so we'll just continue  
19 right through.

20 DR. NEIL HUTCHINSON: Thank you. Neil  
21 Hutchinson, for the Board. Sorry, this is kind of a  
22 follow-up on the trophic status discussion we had  
23 before. But reading your predictions, I was rather  
24 concerned that although you're predicting fairly modest  
25 increases in phosphorus concentrations, your model is

1 predicting pretty radical increases in chlorophyll in -  
2 - in the algal community that follows. And you  
3 predicted chlorophyll up as high as 15 micrograms per  
4 litre, which puts you quite squarely into eutrophic  
5 range.

6                   And so I went digging, and I -- I -- on  
7 your hydrodynamic modelling section in -- in Appendix  
8 8F, you talked about three (3) adjustments you'd made  
9 to your model to increase the algal production, such as  
10 changing the mineralization rate for -- for organic  
11 phosphorus, and changing carbon chlorophyll ratios.  
12 But I'm just concerned that you've over-predicted your  
13 chlorophyll, and we don't quite have and we don't quite  
14 have an accurate assessment of how the lake is going to  
15 end up.

16                   I would expect if you're increasing  
17 phosphorus from six (6) up to about nine (9), your  
18 chlorophyll might go up from -- it's an average of two  
19 (2), two and a half (2 1/2) right now, it should only  
20 go up to four (4) or five (5). So there's a -- I was  
21 just wondering if you could provide some insight into  
22 how you've made those predictions?

23

24                   (BRIEF PAUSE)

25

1 MR. JOHN FAITHFUL: It's John Faithful,  
2 Golder Associates. The -- I think the -- the model  
3 actually predicts phytoplankton. It's whatever it --  
4 whatever the -- it's a GEMSS model, correct? It's a  
5 GEMSS model that has a biological module in it that --  
6 that accounts for -- for a number of different growth  
7 parameters based on -- on background concentrations,  
8 phosphorus being one (1) of them.

9 We -- we do concede that there -- there  
10 is a high level of conservatism around the predictions  
11 for chlorophyll. We focus a lot on the -- on the  
12 phosphorus piece. And -- and I've spoken a lot about  
13 the -- the potential for overpredicting phosphorus in -  
14 - in Lac du Sauvage as a -- as a function in the  
15 modelling.

16 Given that we -- we understand that the  
17 -- that the -- the drive behind the phosphorus in --  
18 in the -- in the discharge water is -- is the  
19 groundwater that's -- that's coming from Miserv. We  
20 have -- we have, as indicated by Fiona, with -- within  
21 the Water Management Plan, the luxury of having a fair  
22 amount of time in order to -- to track predictions in  
23 -- in the Miserv pit.

24 We're going to know well in advance when  
25 we do the pit development as to -- to what the

1 phosphorus numbers are that we're dealing with. And --  
2 and those predictions, whether or not they need to be  
3 man -- the phosphorus whether it needs to be managed  
4 within -- within Miserv pit prior to discharge gives us  
5 a really good insight as to -- to where we're heading  
6 with respect to -- to phosphorus concentrations in --  
7 in Lac du Sauvage.

8                   And that in itself will allow us to --  
9 to continue to evaluate what the potential for changes  
10 to chlorophyll concentrations are. But again, based on  
11 the -- the phosphorus concentrations that we did in --  
12 indeed predict for the -- for the DAR under this  
13 conservative case, we -- we've provided our assessment  
14 findings with respect to ooliotrophic and plankton  
15 concentrations.

16                   DR. NEIL HUTCHINSON: Thank you. Neil  
17 Hutchinson, for the Board. I -- I think what you just  
18 said, John, is -- reinforces the need to have a good  
19 screening value for total phosphorus as Environment  
20 Canada raised, so that as you adaptively manage as you  
21 go, we know what we're managing towards.

22                   But to come back to my original  
23 question, so you think that what it says, chlorophyll  
24 is not chlorophyll A as it's usually seen. It's  
25 actually an expression of phytoplankton biomass and then



1 -- so it's not straight chlorophyll A as measured in  
2 the water, which I think is your first answer?

3 MR. JOHN FAITHFUL: John Faithful,  
4 Golder Associates. Yeah, Neil, we're going to -- we're  
5 going to provide a confirmation on -- on that -- that --  
6 -- on that direct relationship.

7

8 (BRIEF PAUSE)

9

10 THE FACILITATOR: In the next -- it's  
11 Bill Klassen. You'll provide that clarification within  
12 the next hour. Did I understand that correctly?

13 MR. JOHN FAITHFUL: John Faithful, for  
14 Golder Associates. Bill, yes, we're going to do that  
15 within the hour.

16 THE FACILITATOR: Okay. Mr. Paquin...?

17 MR. EMERY PAQUIN: Emery Paquin, with  
18 the Monitoring Agency. My questions are in regards to  
19 the IEMA IR number 4. And in that -- in that IR we  
20 requested the -- the Company to indicate whether  
21 contaminants of potential concerns and nutrients are  
22 predicated to return to pre-development background  
23 levels in Lac de Gras.

24 In your -- in your resp -- in the  
25 Company's response it's -- it was kind of 'yes' and

1 'no'. The -- the models in the DAR predicts that --  
2 predict that some constituents are going to return to  
3 pre-development con -- concentrations, while others  
4 will remain elevated at the -- at the end -- or sorry,  
5 during the -- the post-closure period.

6 My first question is: Are these  
7 predictions made for the end of the post-closure period  
8 in 2060? Or are you expecting these conditions to  
9 manifest -- manifest themselves earlier?

10 MR. JOHN FAITHFUL: John Faithful, for  
11 Golder Associates. Can we show -- throw up one (1) of  
12 the slides from our presentation please?

13 MR. MICHAEL HERRELL: What's his name?

14 MR. JOHN FAITHFUL: John Faithful, for  
15 Golder Associates continuing. The -- the one (1) with  
16 the -- the multiple plots on it.

17

18 (BRIEF PAUSE)

19

20 MR. JOHN FAITHFUL: John Faithful, for  
21 Golder Associates. So if we -- if we look at the -- if  
22 we look at both -- both plots for Lac du Sauvage, the  
23 updated assessment case. And I think this is -- this  
24 is for total dissolved solids. For Lac du Sauvage, as  
25 you see, the -- the relationship there around the --

1 the reference condition prior to the effects to Lac du  
2 Sauvage as a result of project discharge, you get that  
3 progressive increase in -- in -- La -- in TDS  
4 concentrations in Lac du Sauvage.

5                   The different colours reflect the  
6 different assessment nodes. So the -- the gradient  
7 effect with respect to TDS in Lac du Sauvage.  
8 Following the cessation of pumping you get a -- a  
9 gradual return back to -- to what we're saving is sort  
10 -- sort of closure conditions. The -- the  
11 concentration of TDS is slightly higher than what it is  
12 in -- in the reference conditions. It's very close,  
13 but it's slightly higher.

14                   And so in -- in that regard we say that  
15 there is a -- there is an ongoing effect to the change  
16 in -- in water quality. However, it's very close to --  
17 to background conditions. Part of that, what's driving  
18 that TDS is that ongoing discharge from -- from the  
19 site area. And again, coming back to the fact that  
20 we've taken into account a number of conservative  
21 elements, we would sort of probably -- we would sort of  
22 come back to the conclusion that background  
23 concentrations are re-established.

24                   If you go to Lac de Gras we have a very  
25 similar condition, although the pattern in terms of the

1 changes are -- are based around current operations,  
2 cumulative effects, effectively. We get a return of  
3 TDS concentrations within this modelling domain to an  
4 area that's -- that's again close to -- to the original  
5 concentrations. But it's -- it's not exactly where it  
6 is at the -- at the reference condition. It might  
7 eventually get -- get to that point, but within the  
8 modelling domain we see a return back to concentrations  
9 that are slim -- similar to the re -- reference or the  
10 base case concentration.

11 MR. EMERY PAQUIN: Emery Paquin,  
12 monitoring agency. And I looked at those -- at those  
13 charts and I accept your conclusions with respect to --  
14 to TDS. However, in your response to IR -- to our IR,  
15 you also make reference to ten (10) constituent  
16 concentrations which you identify as -- as being -- as  
17 predicted to be higher than the existing conditions,  
18 but well below benchmarks. So in your response, you do  
19 indicate that there are going to be some constituents  
20 that continue to be higher than even existing  
21 conditions.

22 But -- so my question is -- is: Are  
23 your predictions for the end of the closure period or  
24 at some point during the closure period?

25

1 (BRIEF PAUSE)

2

3 MR. MICHAEL HERRELL: It's Mike  
4 Herrell, from Golder Associates. So the -- the model  
5 predicts water quality continuously, and it generates  
6 these time series. What -- we present results in two  
7 (2) ways, one (1) in the time series that presents the  
8 -- the results, and they're calculated at different  
9 time steps but results are pulled out of the model bi-  
10 weekly. And in the tables we present maximum values.

11 So when John's referring to approaching  
12 the baseline conditions, he's talking about at the end  
13 of the predicted period.

14 I do want to comment on that list of  
15 parameters, and back to your original question, which  
16 was some parameters, yes, will go down and others  
17 won't. That's -- the -- the ones that won't, generally  
18 the metals, they're related to inputs in -- that are  
19 built into the model, conservative inputs.

20 So in the -- the lake hydrodynamic  
21 model, a dye is applied for every input into the lake  
22 at a given concentration. And the percentage of that  
23 dye at any particular point in time is used to  
24 calculate a concentration.

25 And the inputs that are used to

1 calculate that concentration from each source, a  
2 maximum concentration would be used. So, for example,  
3 for Slipper Lake, the inflow to Lac de Gras, a maximum  
4 concentration during the -- the whole operational  
5 period for a metal may be applied at post-closure when  
6 it would be much lower than it is.

7                   So some of the parameters that are --  
8 are -- that are predicted not to return to baseline  
9 conditions are based on really conservative  
10 assumptions. In reality, it's more likely that they  
11 would re -- return to baseline conditions.

12                   MR. EMERY PAQUIN: Emerv Paquin, with  
13 the Monitoring Agency. Yes, it's -- it is recognized  
14 that all of your predictions are based upon a  
15 conservative approach, which you have reiterated  
16 throughout these hearings.

17                   My second -- my second question is with  
18 respect to the -- your response to the same IR. And  
19 that is where you say that, if the -- if the Misery pit  
20 water quality monitoring data begins to trend beyond --  
21 beyond the DAR predictions, and then Dominion Diamonds  
22 has sufficient time to proactively address adaptive  
23 management.

24                   Now, in your -- in -- in the same  
25 presentation that you gave late this morning, you

1 provided examples of some adaptive management  
2 strategies.

3 My question is: How are you going to --  
4 to get between the time where you recognize that the  
5 water quality data is trending beyond the DAR -- the  
6 DAR predictions and actually implementing or deciding  
7 which of the adaptive management strategies that you're  
8 going to implement?

9 Have you considered which -- have you  
10 considered criteria that would trigger specific  
11 adaptive management strategies?

12

13 (BRIEF PAUSE)

14

15 MR. EMERY PAQUIN: Just -- just -- and  
16 it's Emery Paquin again. Just a supplementary comment.  
17 It goes almost without saying that sufficient lead time  
18 in order to begin to consider adaptive management  
19 strategies would be critical.

20

21 (BRIEF PAUSE)

22

23 MR. ERIC DENHOLM: It's Eric Denholm  
24 speaking. Yeah. Under the -- under the Ekati water  
25 licence, we're in -- we're just now finalizing -- or

1 put it this way. With the Wek'eezhii Land and Water  
2 Board for review is an aquatic response framework that  
3 ties to the aquatifi -- Aquatic Effects Monitoring  
4 Program to provide just what you're asking about:  
5 thresholds, early warnings levels, and so on.

6 So what we anticipate is that the Jay  
7 project, relevant aspects of the Jay project, would be  
8 incorporated into that response framework under the  
9 water licence, which is for the purpose that you're --  
10 I think you're getting at. Thanks.

11 MR. EMERY PAQUIN: Emery Paquin, with  
12 the Monitoring Agency. Yes. And -- and I understand  
13 that the aquatic response framework is currently draft.  
14 When do you anticipate finalizing that framework?

15 MR. ERIC DENHOLM: Yeah. It's Eric  
16 Denholm here. At the moment, that's subject an  
17 undergoing review from the Water Board, and the  
18 timelines are -- are set by the -- the Water Board, and  
19 we're -- it's a process underway. We'll work with the  
20 Water Board timelines and -- to complete that. Thanks.

21

22 (BRIEF PAUSE)

23

24 MR. KEVIN O'REILLY: Thanks. Kevin  
25 O'Reilly,



1 with the Monitoring Agency. Yeah, the -- the Agency  
2 has been involved in, I guess, the two (2) drafts of  
3 the aquatic response framework that have been submitted  
4 so far, and there's a -- a lengthy list of additional  
5 information that the Company is going to provide, and I  
6 guess there may be a workshop as early as May to start  
7 to talk about that, and perhaps finalize it.

8 I guess the issue though for us here  
9 during this environmental assessment is: Is there any  
10 sort of direction or advice that we -- we want to pass  
11 along to the Review Board and to the Company in terms  
12 of when that aquatic response framework is finalized  
13 and it's updated for Jay, what sort of things should be  
14 considered there?

15 I guess I'm just throwing that out as a  
16 question, particularly in light of -- or with regard to  
17 contingencies for water management, because that's  
18 obviously a big issue here. And we're -- we're going  
19 to be thinking about that, and -- but I don't know if  
20 you have any response or -- at this point.

21

22 (BRIEF PAUSE)

23

24 MR. RICHARD BARGER: Yeah, Richard  
25 Barger, Dom -- Dominion Diamond. I -- I'm not sure

1 the -- exactly there -- there was a question there. I  
2 think it was more like a comment from Kevin.

3 I'd just make the point that, you know,  
4 we do have a five (5) year period here as well, to --  
5 you know, during the life of the project to -- to  
6 consider just those kinds of -- those kinds of issues.

7 THE FACILITATOR: Okay, thank you.  
8 It's Bill Klassen. Todd, you have a question?

9 MR. TODD SLACK: Thanks. It's Todd,  
10 from the Yellowknives. I'm guessing the -- I have a  
11 similar question to the one that was asked earlier by  
12 Dr. Hutchinson, and it -- it's: At what point would  
13 you begin to see significant impacts from TDS? We're  
14 looking again at the significance thresh --  
15 establishing a significance threshold, here.

16

17 (BRIEF PAUSE)

18

19 MR. JOHN FAITHFUL: It's John Faithful,  
20 Golder Associates. A significance threshold would be a  
21 -- a persistent chronic toxicity effect in the  
22 receiving environment as a result of TDS  
23 concentrations.

24 MR. TODD SLACK: Todd Slack, with the  
25 Yellowknives. Well, that naturally -- I'm sure you can

1 anticipate the question -- bears the question: At what  
2 point would that happen?

3

4 (BRIEF PAUSE)

5

6 MR. JOHN FAITHFUL: It's John Faithful,  
7 Golder Associates. Todd, I don't have an answer for  
8 that as an abs -- absolute value at this point in time.  
9 We do have -- have guidelines specifically that we can  
10 refer to. But just coming back to -- to where we ended  
11 up with with respect to -- to the DAR conclusions,  
12 we've been able to evaluate a -- a conservative case in  
13 terms of -- of Miserv pit discharge to the Lac du  
14 Sauvage, and -- and we're not predicting chronic  
15 effects to occur, that's out of the -- the conceptual  
16 diffuser design that we've applied to -- to the  
17 modelling within Lac du Sauvage.

18 MR. TODD SLACK: Thanks. It's Todd,  
19 with the Yellowknives. And, yeah, I certainly hope  
20 you're correct, but we've had instances where  
21 predictions, particularly around TDS, haven't always  
22 been so correct. So, you know, that's the nature of  
23 this question.

24 Now, you guys have proposed a TDS SSWOO  
25 of a thousand (1,000). I'm wondering if you can give

1 us some information where that number comes from?

2

3 (BRIEF PAUSE)

4

5 MR. JOHN FAITHFUL: It's John Faithful,  
6 from Golder Associates. Todd, I -- I apologize. I --  
7 I missed the question. Could you repeat it, please?

8 MR. TODD SLACK: Sure. In Attachment  
9 AF-1, the Company proposes a TDS SSWOO of a thousand  
10 (1,000). And I'm just wondering, where does this  
11 number come from?

12

13 (BRIEF PAUSE)

14

15 MR. JOHN FAITHFUL: John Faithful,  
16 Golder Associates. Todd, we're going to have a look at  
17 that document and -- and determine whether -- whether -  
18 - the wording that's -- that -- in it to determine  
19 whether or not we actually specify site-specific water  
20 quality objective. The -- the site that -- we do use  
21 site-specific water quality objectives as part of our  
22 screening criteria, those that have been established  
23 specifically for -- for the Ekati operation.

24 We do include some of the parameters  
25 that constit -- that -- that constitute TDS, that being

1 nitrate, sulfate, and chloride. But we'll -- we'll  
2 take a look at that particular reference. If you could  
3 confirm what that reference was?

4 MR. TODD SLACK: It's Todd Slack, with  
5 the Yellowknives. I have Attachment AF-1. And, yeah,  
6 if you guys want to take it away and come back. If we  
7 can -- just have an opportunity to speak to this when  
8 they do, that'd be great.

9 MR. CHUCK HUBERT: Chuck Hubert, with  
10 the Board. Todd, just one (1) minute, Attachment AF-1  
11 to which document?

12 MR. JOHN FAITHFUL: Appendix 8-F.

13 THE FACILITATOR: Thank you. It's Bill  
14 Klassen. Environment Canada has a question, then I  
15 believe there's a question over here somewhere.

16 MS. MEAGAN TOBIN: Hi. It's Meagan  
17 Tobin, with Environment Canada. Just a bit of a  
18 follow-up to Todd with the TDS and toxicity. So this  
19 is in relation to Environment Canada's IR-20. And so  
20 we would like to clarify one (1) of the statements.

21 So in Dominion's response, they had  
22 stated that chronic toxicity is only applicable to the  
23 mixture of pit water and water at the edge of the  
24 mixing zone. And this was in response to when we had  
25 asked if they would be willing to complete the lethal

1 toxicity of the Miserv pit effluent.

2                   So we'd like to clarify that chronic  
3 toxicity is done on effluent at end-of-pipe for the  
4 purpose of evaluating the effects. And it is not  
5 routinely done in the receiving environment, with the  
6 exception being Snap Lake, but they do this in addition  
7 to their end-of-pipe, sublethal testing. So we would  
8 like to reiterate our initial IR of just whether  
9 Dominion is willing to conduct sublethal tests on  
10 Ceriodaphnia for simulated effluent.

11

12                   (BRIEF PAUSE)

13

14                   MR. ERIC DENHOLM: Yeah, it's Eric  
15 Denholm speaking. Yeah, so -- yeah, we acknowledge in  
16 the -- the Ekati water licence itself calls for  
17 sublethal testing not as a com -- compliance test, but  
18 for -- as just part of the SNP collection of  
19 information, and so acknowledge that on an operational  
20 basis. I think I'd just -- just like to -- to  
21 highlight a couple of things. And one (1) is our --  
22 our commitment for the -- you know, the effluent from -  
23 - from Miserv pit is not acutely -- non-acutely toxic.  
24 That is the -- the standard that we've -- we've said.

25                   And so given that, I think the intent --

1 the broader intent of our response was to say that for  
2 -- for the assessment, for -- for right now, for the  
3 purpose of assessing potential effects of Jay project,  
4 we don't see the sublethal testing as playing a role.  
5 We've -- because that's not a test that we would think  
6 the effluent is going to put -- put to on a -- on a  
7 compliance basis. Thanks.

8 MS. MEAGAN TOBIN: Meagan Tobin,  
9 Environment Canada. So I guess just for -- for our  
10 point, given some of the issues that have happened at  
11 other mines, the use of the more sensitive test  
12 organisms with the mortality end point can tell us more  
13 about the potential environmental effects.

14 For example, the high -- or TDS waters  
15 could affect the sensitive daphnids and the clams more  
16 than the standard acute tests like the rainbow trout  
17 and the daphnia, which are not as sensitive to  
18 salinity. So that's just our reason for asking for  
19 this test.

20 MR. ERIC DENHOLM: Okay. Eric Denholm  
21 speaking. Okay. Thanks for the comment.

22

23 (BRIEF PAUSE)

24

25 THE FACILITATOR: It's Bill Klassen. I

1 understand that there's another question here at...

2

3 (BRIEF PAUSE)

4

5 THE FACILITATOR: We have a mvsterv  
6 quest here that...

7 MR. GORD MACDONALD: Gord MacDonald,  
8 with Diavik. No mvsterv. Thanks for all the  
9 information you guys have provided on -- on Lac de Gras  
10 and on the additional -- the additional scenarios that  
11 were run. The information does help us. Our -- our  
12 question to Dominion, I'll start with, is -- is: Will  
13 -- will DDC assess -- so it's -- it's great that all  
14 the information is there, but I think we're waiting on  
15 -- on assessment of impacts, and in particular for us,  
16 whether -- whether DDC is going to look at the  
17 assessment of impacts on downstream users, in  
18 particular, industrial and municipal users.

19 And included within that would be the  
20 impact on industrial and municipal users. And included  
21 within that would be the impact on industrial waste  
22 assimilation, and is that something DDC's going to do?

23 MR. JOHN FAITHFUL: John Faithful,  
24 Golder Associates. Thanks, Gord. We believe that the  
25 assessment end point that we've -- we've applied and



1 assessed is -- in the DAR takes into account in -- all  
2 potential uses, and -- and that includes the industrial  
3 uses.

4 The level of protection that we apply  
5 around that assessment end point, it's -- it's linked  
6 to aquatic life, wildlife, and human use. And -- and  
7 that -- that's potentially much greater, in our view,  
8 than -- than what would be required for industrial  
9 uses.

10 So we -- we think that we've -- we've  
11 accommodated that -- that particular element that  
12 you've requested in our assessment endpoint.

13 MR. GORD MACDONALD: Gord MacDonald,  
14 with Diavik. So -- so less on the -- on the inability  
15 to use water for withdrawal, but more on an ability to  
16 discharge water, because the chemistry of the receiving  
17 environment has changed?

18

19 (BRIEF PAUSE)

20

21 MR. JOHN FAITHFUL: John Faithful,  
22 Golder Associates. One (1) of the -- one (1) of the  
23 elements that we've -- that -- that Dominion have taken  
24 into -- into the mine plan is -- is consideration of  
25 time frame around of -- of operations.

1                   And with respect to the Water Management  
2 Plan and -- and the -- and the planned discharge to --  
3 to Lac du Sauvage, I think, to the extent possible, the  
4 -- the plan has to -- to minimize any potential overlap  
5 with respect to -- to operations.

6                   You know, but in saying that, to  
7 reiterate our point in terms of the -- the conservatism  
8 around the -- the applications of our assessment end  
9 points and the protectionism that we're -- we're  
10 gearing towards, we believe that we've -- we've  
11 accommodated that -- that industrial use element.

12                   MR. GORD MACDONALD:     Gord MacDonald,  
13 with Diavik. So I -- I guess we'll just disagree on  
14 that, and I'll the question to the Board and ask in --  
15 you put out an IR with respect to assessment end  
16 points. I don't know who I'm actually speaking to when  
17 I speak to the Board. And you asked whether we thought  
18 the assessment end points were appropriate or not, and  
19 we did comment that we didn't think an assessment end  
20 point on industrial use had been included in the -- in  
21 the DAR.

22                   What does the -- what is the Board doing  
23 with -- with our response to your IR?

24                   MR. MARK CLIFFE-PHILLIPS:     Mark Cliffe-  
25 Phillips, with the Review Board. So right now at -- at

1 the conclusion of the technical sessions, the -- the  
2 Board will be briefed on the outcomes of the IR  
3 responses as well as the discussions here at the  
4 technical session. And we'll bring that in front of  
5 the Board, and the Board will take that into  
6 consideration.

7 MR. GORD MACDONALD: Thanks, Mark.  
8 It's easier than saying, "Board." So we'll just say  
9 that we don't -- we don't think that that assessment  
10 end point has been addressed, and we think it should  
11 be. But obviously, it's up to the Board to make the  
12 decision. Thank you.

13 THE FACILITATOR: Thank you. It's Bill  
14 Klassen. We've got roughly twenty (20) minutes left  
15 before we move to identifying what the summary of  
16 undertakings and commitments are. So are there other  
17 questions related to this water topic generally?

18 I see someone nodding that they're  
19 having a question.

20 MR. BARRY ZAJDLIK: Barry Zaidlik, on  
21 behalf of the GNWT. Are we okay with the -- the  
22 handout that I gave to -- or that DDC received?

23 THE FACILITATOR: It's Bill Klassen.  
24 I'm personally not familiar with that.

25 Is there someone here -- Mark will speak

1 to it.

2 MR. MARK CLIFFE-PHILLIPS: Maybe I'll  
3 just speak to this a bit. Mark, with the Review Board.  
4 Barry Zaidlik, technical advisor to GNWT, had come to  
5 us with a -- a handout with a summary of some of the  
6 material that was provided in a -- a response to an IR  
7 to -- to GNWT.

8 It involves a table and a -- a summary  
9 figure, and we presented that to -- to some of the  
10 staff at Dominion. And what -- what -- we just want to  
11 hear a response if we could speak to that today?

12 MR. ERIC DENHOLM: Yeah, it's Eric  
13 Denholm speaking. Yes, I have it here but I didn't  
14 want to interrupt the -- you know, we need -- we  
15 haven't taken a look at it yet. I didn't want to  
16 interrupt the questions that were going on. So -- so  
17 we have not looked at that yet with the folks that can  
18 sort of validate it, so.

19 MR. NATHAN RICHEA: Thank you. It's  
20 Nathan Richea, with the Water Resources.

21 We have additional copies here for Board  
22 and -- and people who are interested, if they're...

23 DR. KATHY RACHER: Could you guys just  
24 -- just let us know what this -- in general what the  
25 question is about and what the handout is about, so we

1 can get some context because most of us haven't seen  
2 it? The summary of -- yeah, a summary of what you're  
3 looking for.

4 MR. BARRY ZAJDLIK: Barry Zajdlik, on  
5 behalf of the GNWT. The question has to do with the  
6 likelihood of the pit lakes being permanently  
7 stratified. How stable is the meromixis?

8 DR. KATHY RACHER: Okay. Kathy Racher,  
9 for the Board. And the handout you have just has some  
10 -- has what on it?

11 MR. NATHAN RICHA: So yeah, it's  
12 Nathan Richea, with the Water Resources.

13 We posed an IR about this to the  
14 Company. They responded with some information, but the  
15 information came in different sources. So what we've  
16 done is compiled the information into one (1) document  
17 for ease of ref -- for ease of reference, and -- and to  
18 -- to explain and talk about these various things with  
19 the Company as part of the technical sessions.

20 THE FACILITATOR: It's Bill Klassen.  
21 I'll ask Mark to respond.

22 MR. MARK CLIFFE-PHILLIPS: Maybe just  
23 in light of Dominion needing to -- to review the  
24 materials, just to -- to make sure that it -- it  
25 matches with the submission that they had provided

1 within their IR, if we move this to tomorrow morning,  
2 we'll have opportunity to speak to that. And we'll  
3 continue with other questioning, if you have other --  
4 other questions not related to the handout.

5 MR. NATHEN RICHEA: Thank you. It's  
6 Nathan Richea, with Water Resources.

7 And we can provide it to the Board, if  
8 they want it for the registry, and -- and things of  
9 that matter, so.

10 THE FACILITATOR: Okay, thank you. Are  
11 there other questions on the water topic? Environment  
12 Canada, go ahead.

13 MS. MEAGAN TOBIN: Yeah, this is Meagan  
14 Tobin, with Environment Canada. This is just a  
15 comment on the presentation. I noted that they --  
16 they're doing a supplemental baseline hydrology for  
17 2015.

18 I was just wondering if the water  
19 quality supplemental baseline program was also going to  
20 be extended through 2015?

21

22 (BRIEF PAUSE)

23

24 MR. RICHARD BARGER: Richard Barger,  
25 Dominion Diamond. Sorry, we -- too many questions at

1 one time here. We've -- we -- we're segregated in  
2 multiple conversations.

3 MR. JOHN FAITHFUL: John Faithful,  
4 Golder Associates. The -- the plan is for a water  
5 quality program to -- to accompany the hydrology  
6 program with -- with respect to -- to its plans for --  
7 for supplemental monitoring this year.

8 MS. MEAGAN TOBIN: Okay, great.  
9 Thanks. Meagan Tobin, with Environment Canada. I just  
10 -- one (1) follow-up question.

11 With regards to the AEMP, which I know  
12 is usually deferred to the water licencing stage, are -  
13 - is this baseline program going to supplement and  
14 inform the decision making for the locations of the  
15 AEMP? I'm just wanting to make sure that the baseline  
16 that we're covering now is going to be useful for the  
17 eventual AEMP.

18 MR. ERIC DENHOLM: It's Eric Denholm  
19 speaking. Yes. Yeah.

20 MS. MEAGAN TOBIN: Meagan Tobin.  
21 Thank you.

22 THE FACILITATOR: Todd has a question.

23 MR. TODD SLACK: Can I -- I have got  
24 two (2) short ones. I think one actually might be hard  
25 to -- to answer, but in -- in listening to Gord's

1 conversation it brought back part of the Snap Lake  
2 discussions, and one of the things that the leadership  
3 was rather astonished to -- to learn is that Snap Lake  
4 will be 90 percent effluent by the time we get around  
5 to thinking about closure on that.

6                   So we're -- we have a number of  
7 operations here. Can the project tell us what the  
8 percentage of Lac de Gras will be relative to -- or  
9 will be effluent? You know, so what's the flushing  
10 rate versus the -- the amount you're inputting into the  
11 lake?

12

13                   (BRIEF PAUSE)

14

15                   MR. JOHN FAITHFUL: John Faithful,  
16 Golder Associates. We're talking about two (2) very  
17 different systems with respect to Snap Lake being a  
18 much smaller lake compared to -- to Lac de Gras -- de Gras  
19 being a -- a very large lake. And I think there is --  
20 as part of the discharge process there is going to be  
21 mine water that enters into -- into Lac de Gras through  
22 Lac du Sauvage.

23                   There is a -- there is a substantial  
24 assimilation capacity within Lac de Gras. And on top  
25 of this, it's -- it's also -- it's -- it's -- you're



1 also dealing with the -- the cumulative effects that  
2 we've -- we've included in our assessment.

3 MR. TODD SLACK: It's Todd Slack, with  
4 the -- the Yellowknives. And I -- listen, I've been to  
5 Lac de Gras. It's a big lake. I get that.

6 But I'm just wondering, can you put a  
7 number on that, like a percentage?

8

9 (BRIEF PAUSE)

10

11 MR. TODD SLACK: And if it's helpful  
12 for time, if you want to take this away, that's fine  
13 too.

14

15 (BRIEF PAUSE)

16

17 MR. JOHN FAITHFUL: John Faithful,  
18 Golder Associates. I think, Todd, what we could --  
19 what we could agree to do is -- is to look at -- to  
20 provide a comparison between the -- the volumes of Lac  
21 -- Lac de Gras and -- and Snap Lake.

22 I think for the purposes of the -- or --  
23 or to illustrate or to -- to really hit home the  
24 differences between the two (2) systems, I think coming  
25 up with a -- with a particular ratio when you've got a

1 number of different inputs would -- doesn't provide any  
2 value to -- to -- or affect any of the conclusions that  
3 we've made with respect to our DAR assessment.

4 DR. KATHY RACHER: Kathy Racher, for  
5 the Board. So -- so you've agreed to just try to slap  
6 some numbers together for comparison. I -- I do think  
7 it's a reasonable request and, you know, just to  
8 compare, yeah, the -- the volume -- the potential  
9 volume of effluent in the year versus the -- the total  
10 volume of Lac de Gras in comparison to Snap Lake.

11 Snap Lake has been a big topic of  
12 conversation. I think you're right. I think the  
13 situation is significantly different. But if there's  
14 an easy way that you can show that difference, I think  
15 that could be very helpful.

16

17 (BRIEF PAUSE)

18

19 MR. RICHARD BARGERY: Richard Bargery,  
20 Dominion Diamonds -- Dominion Diamond. Sorry, somebody  
21 says "Diamonds" here, so.

22 These are very different scenarios on  
23 different lakes, but I think what we can do is we can  
24 take this away as -- as an under -- undertaking is the  
25 two (2) week period? Yes. An undertaking and come

1 back with something that -- that satis -- satisfied  
2 Todd's request.

3 MR. TODD SLACK: Thanks. And that --  
4 that's great, because it is -- it is one (1) of those  
5 things. I mean, hev, when people say it was 90  
6 percent, that causes concern.

7 But if I could add one (1) other item to  
8 that, is what is the residency time of water in Lac de  
9 Gras? How quickly does it flush? Because that's going  
10 to affect it as well.

11 MR. RICHARD BARGER: Richard Barger,  
12 Dominion Diamond. That -- that could form part of the  
13 -- the undertaking, I think.

14 MR. TODD SLACK: Great. And then the  
15 simple question, trademark, is there -- in terms of  
16 construction there's a shoal relatively close to the  
17 dike. It's less than a kilometre away.

18 And I'm wondering if the project can  
19 commit to secondary monitoring at this site to ensure  
20 that it's not receiving sediments that would cover over  
21 potentially important fish habitat. And I'm saying  
22 that today because of TSS, not because of fish. So  
23 there you go.

24

25 (BRIEF PAUSE)

1 MR. RICHARD BARGERY: Richard Bargery,  
2 Dominion Diamond. I think we'd -- we'd like to still  
3 defer this over to the fish, because we have someone  
4 that's not -- not here that we -- we can have a  
5 discussion about that tomorrow -- tomorrow morning, or  
6 whenever -- whatever the time frame is now.

7 THE FACILITATOR: Okay. It's Bill  
8 Klassen. Rather than take up time here with the list  
9 of responses that Dominion Diamond will be bringing  
10 back tomorrow, staff will be -- the Board will go over  
11 that with Dominion Diamonds (sic) and then that list  
12 will get posted on the registry so that all are aware  
13 of -- of that. So we'll continue to use the remaining  
14 time for questions.

15 Are there other questions --

16 MR. RICHARD BARGERY: Bill? I'm sorry.  
17 I -- I don't -- Richard Bargery, Dominion Diamond. I  
18 don't have a question, but I think we can respond to  
19 Barry's -- Barry's chart, at least a preliminary  
20 response. Mike -- Mike can provide at least a  
21 preliminary response now, and that may be...

22

23 (BRIEF PAUSE)

24

25 MR. MICHAEL HERRELL: It's Mike

1 Herrell, from Golder. Can we -- can we pull up the --  
2 the water quality presentation, please? And perhaps  
3 slide number 19. So I -- I've taken a moment to -- to  
4 review this -- this chart to come back to the IR that  
5 GNWT was referring to. It's IR GNWT-62. The request  
6 was there's a -- a paper that was published in -- or  
7 was presented at the -- as a -- as a poster at the  
8 ICARD conference in St. Louis in 2006 on the -- the  
9 relevance of -- of meromixis in pit lakes.

10 And what that paper was was a summary of  
11 pit lakes that have -- that have demonstrated to  
12 establish meromictic conditions and the -- the  
13 stability of those meromictic conditions. And -- and  
14 the request was to draw parallels from -- from that  
15 paper, the -- the pit lakes that were presented in --  
16 in that paper to -- to the -- the Jay project.

17 GNWT has provided a handout that -- that  
18 is based on a response that provides -- that indicated  
19 several pit lakes and what the -- indicating that  
20 meromictic conditions would occur and has provided a  
21 ratio of the mixolimnion concentrations to the -- the  
22 monimolinion concentrations.

23 I will seek out clarity of the relevance  
24 of what that ratio actually means, but before I do that  
25 I would like to start by talking about the -- the work

1 that has been done at -- at the -- for the -- the Jay  
2 project. Several models have been updated and these  
3 are robust models that are hydrodynamic models that  
4 account for several processes, not just the  
5 concentration in the mixolimnion and the monimolimnion.  
6 It's a hydrodynamic model to pre -- that will generate  
7 currents within the lake and evaluate whether the pit  
8 will overturn or not based on starting concentrations  
9 in the -- the mixolimnion and the -- the monimolimnion.

10 So what the model will do is it'll --  
11 it'll account for wind-driven mixing forces in the  
12 model, temperature within -- in the convection in -- in  
13 the lake, as well as the density differences of the --  
14 the mixolimnion and the monimolimnion, which is more of  
15 a -- which is the -- the key control on whether meromix  
16 -- meromictic conditions will establish within the pit  
17 lake.

18 And based on the -- the predicted water  
19 qualities for the mixolimnion and the monimolimnion,  
20 it's likely that the meromictic conditions -- well,  
21 it's not likely, it -- it is -- it's predicted that  
22 meromictic conditions will occur. These waters are --  
23 have very high density differences. So, for example,  
24 in the EA assessment case, the monimolimnion  
25 concentration in the Jay pit that we see on screen here

1 is roughly 2,500 milligrams per litre versus less than  
2 -- than a hundred (100). So there's a high level of  
3 confidence that these -- these pit lakes will remain  
4 stable in the long term.

5 I'm -- I'm not sure computing a ratio of  
6 the mixolimnion and the monimolimnion concentrations  
7 will provide any insight into the stability of the pit  
8 lakes, because there's several other factors that can  
9 affect that, and it's -- including the -- the density,  
10 the volumes of the water that's stored in the -- the  
11 monimolimnions and the mixolimnions, and the depth of  
12 the -- the depth of the -- the fresh water cap.

13 However, what -- what I can state is  
14 that, based on the modelling done to date and on the  
15 literature -- and the key purpose of that response was  
16 to indicate that several pit lakes have -- have  
17 demonstrated meromictic conditions. And several of the  
18 pit lakes that were provided in that response had much  
19 lower density gradients than what is modelled to occur  
20 at the Jay project. So there's a high level of  
21 confidence that meromixis will occur at the -- in the  
22 Jay pit, and also in the -- the Misery pit.

23 MR. BARRY ZAJDLIK: Barry Zajdlik, on  
24 behalf of GNWT. Thank you for that explanation, but  
25 the reason for conducting the ratios was to see in a

1 different how the predictions made by DDEC fit in with  
2 other predictions in meromictic lakes.

3                   So I used the case studies that were  
4 provided and looked at the ratio of the end lake  
5 concentrations in the top layer stratified and the  
6 bottom layers. And you'll see that the DDEC  
7 predictions are an order of magnitude more optimistic  
8 in terms of sequestering the high saline waters at the  
9 bottom of the pit. And that has obvious implications  
10 to discharge.

11                   The -- the concern here is that, if the  
12 ratios are biased -- and I have some questions about  
13 the modelling that was done -- but if these ratios are  
14 biased low, then the predicted TSS concentrations in  
15 the mixolimnion are going to be much higher than --  
16 than predicted here.

17                   So that's -- that's a preamble to the  
18 questions that I have. The first question is: In  
19 terms of the drivers of stratification, I know that --  
20 that the densities are important. But, you know, your  
21 ratios are so different than the case studies. Can you  
22 comment as to why the ratios are different?

23

24                   (BRIEF PAUSE)

25



1 MR. MICHAEL HERRELL: It's Mike  
2 Herrell, from Golder Associates. So the ratios will be  
3 different. I mean, in my -- in my opinion, I don't  
4 think it's a meaningful estimate of the stability of a  
5 pit lake. I think a more meaningful estimate of  
6 stability of a pit lake is a hydrodynamic model, which  
7 we have developed as part of this project.

8 To answer your question, though, on the  
9 ratio, the reason they're different, this is an outcome  
10 of a detailed and robust comprehensive model that was  
11 completed as part of the project that included a  
12 hydrogeological model input, a detailed site water  
13 quality model -- model input, and also the -- the Water  
14 Management Plan that has been developed for the  
15 project.

16 To speak to why they would be so  
17 different, I think it would be driven mainly on the  
18 water management strategy that is specific to the Jay  
19 project which calls for pumping of a lot of fresh water  
20 from Lac du Sauvage into the Jay pit at closure.

21 So to put this into perspective, the  
22 water that's pumped from Misery at closure, I believe,  
23 under the EA assessment case, the -- the mix  
24 concentrations that end up in the monimolimnion are  
25 greater than 2,500 mg -- milligrams per litre of TDS,

1 whereas the concentrations in Lac du Sauvage, the mean  
2 concentration, is roughly 16 mil -- milligrams per  
3 litre.

4                   So you're putting water of 16 milligrams  
5 per litre on top of higher TDS water, you're going to  
6 get a much different ratio.

7                   MR. BARRY ZAJDLIK: Is there a way to  
8 do a sensitivity analysis to look at what the key  
9 drivers of this -- of the stability of this  
10 stratification is?

11                   MR. MICHAEL HERRELL: It's Mike  
12 Herrell, from Golder Associates. Yes, there is. We --  
13 we've actually done a sensitivity analysis as a part of  
14 this process. In the -- the key drivers -- one (1) are  
15 density, and the other one is the -- the wind  
16 sheltering coefficient, so wind -- wind generation and  
17 -- which will cause wind-driven mixing in the pit -- in  
18 the pit lakes.

19                   So we've -- we've done a sensitivity  
20 analysis. The original predictions were based on a  
21 wind sheltering coefficient of point five (.5). That  
22 was updated to point eight (.8), so we increased the --  
23 the wind influence by 30 percent. And the outcome of  
24 that was, there was some additional mixing, but the --  
25 the conclusions were the same as in the DAR.

1                   So based on several sensitivities,  
2 meromictic conditions are going to form within the Jav  
3 Pit and the Miserv Pit, and remain stable in -- in the  
4 long term.

5                   MR. BARRY ZAJDLIK:   Barry Zajdlik, on  
6 behalf of GNWT. You mentioned one -- one exercise they  
7 did with respect to sensitivity analysis. Were there  
8 others?

9

10                                   (BRIEF PAUSE)

11

12                   MR. MICHAEL HERRELL:   It's Mike  
13 Herrell, from Golder Associates. Yeah, so the -- the  
14 two (2) cases are sensitivities that I was -- was  
15 referring to, the first one was the DAR assessment  
16 case, and then the other one was the updated assessment  
17 case which was described as part of the presentation  
18 this morning.

19                   Also as part of the -- the IR -- IR  
20 responses, we've done another sensitivity for the  
21 reasonable estimate case to evaluate what the more  
22 likely concentrations of the -- the discharge are going  
23 to be during operations and at closure, and that --  
24 that model sensitivity resulted in -- in a -- in a  
25 lower TDS concentration in the Miserv pit during

1 operation.

2                   So the Water Management Plan was still  
3 the same, that at closure, 50 metre -- the upper 50  
4 metres of Miserv was pumped to the bottom of Jav.  
5 However, in that sensitivity, that produced a much  
6 lower density in comparison to the DAR predictions.  
7 And even under the -- the lower densities scenario,  
8 meromictic conditions were still identified to form and  
9 remained stable in the long term.

10                   MR. BARRY ZAJDLIK:   Correct me am I  
11 wrong -- if I'm wrong, but in that scenario you talked  
12 about with the lower density gradients, did you also  
13 consider the effects of salt exclusion?

14                   MR. MICHAEL HERRELL:   It's Mike  
15 Herrell, from Golder Associates. Yes, we did.

16                   MR. BARRY ZAJDLIK:   Barry Zajdlik, on  
17 behalf of GNWT. So you actually modelled the effects  
18 of salt exclusion on the stability -- or that  
19 meromixis?

20                   MR. MICHAEL HERRELL:   It's Mike  
21 Herrell, from Golder Associates. So, yes. The -- the  
22 way it's included in the model is during the winter, an  
23 ice thickness of 1.5 metres is assumed in the -- in the  
24 model, and that will reject salts into the mixolimnion,  
25 and increase the density of the mixolimnion under ice.

1 So that is accounted for in the model.

2 MR. BARRY ZAJDLIK: Barry Zaidlik, on  
3 behalf of GNWT. Maybe you could help me understand the  
4 sentence, then. It says:

5 "Although the W2 model used to  
6 predict pit stratification can model  
7 formation of ice cover, it does not  
8 include salt exclusion."

9 That's in Appendix 8-G.

10 MR. MICHAEL HERRELL: Yeah. It -- it's  
11 Mike Herrell. We'll -- we'll -- for Gold -- for --  
12 from Golder. We'll look into that, and we'll provide  
13 some clarity around that statement.

14 MR. BARRY ZAJDLIK: Barry Zaidlik, on  
15 behalf of GNWT. Could you also provide the sensitivity  
16 analysis that lead to the conclusion that meromixis  
17 will be perennial?

18

19 (BRIEF PAUSE)

20

21 MR. MICHAEL HERRELL: It's Mike  
22 Herrell, from Golder. Just to clarify your question,  
23 you're asking that the -- by stating, "perennial," that  
24 it -- it won't be stale throughout the year? Is that  
25 correct?

1 MR. BARRY ZAJDLIK: Barry Zaidlik, on  
2 behalf of GNWT. No. Perennial, I think you're  
3 referring to the lakes being stratified forever, so not  
4 just over the course of a year, but in perpetuity.

5

6 (BRIEF PAUSE)

7

8 MR. MICHAEL HERRELL: It's Mike  
9 Herrell, from Golder Associates. So the long-term  
10 modelling was actually completed as part of the DAR,  
11 and that's provided in Appendix 8G. The CE-OUAL model  
12 was only run for a period of two hundred (200) years  
13 but to evaluate the long-term, fifteen thousand  
14 (15,000) years into the future, stratification in -- in  
15 the pit lakes, that was done as a vertical slice  
16 spreadsheet model. And the results of that are  
17 provided in Appendix 8G.

18 MR. BARRY ZAJDLIK: Barry Zaidlik, on  
19 behalf of GNWT. Yes, I understand. I've looked at  
20 those -- those results, but I don't see how they're  
21 linked to the sensitivity analysis. What I'm looking  
22 for is perturbing some of these coefficients that are  
23 used in the modelling.

24 And Sachi actually raised a -- a point  
25 that I hadn't considered before. There is uncertainty

1 into the groundwater inflows, but there may be also  
2 uncertainty in terms of the ratios of groundwater to  
3 surface water in these pits. So there are several  
4 levels of uncertainty that I don't have been in -- in -  
5 - considered in the sensitivity analysis.

6

7

(BRIEF PAUSE)

8

9

MR. MICHAEL HERRELL: It's Mike  
10 Herrell, from Golder Associates. So as part of the IR  
11 responses, we -- we developed what we referred to as  
12 the compendium of supplemental water quality modelling.  
13 So the sensitivity analysis that I was referring to  
14 were also updated as part of the -- as part of those  
15 vertical slice spreadsheet models. So all -- all those  
16 models were updated for the different sensitivities  
17 that I'm referring to. And those are provided in -- in  
18 Appendix B of the IR responses.

19

In terms of cert -- uncertainty in the  
20 groundwater inflows, that has also been addressed as we  
21 presented this morning. A reasonable estimate case,  
22 which accounted for lower groundwater inflows, was also  
23 completed as part of -- as part of the -- the ongoing  
24 work. And that -- that was also updated for the post-  
25 closure period, which formed the basis of the flows

1 that were included into the -- the hydrodynamic models  
2 to evaluate the stability of the pit lakes in post-  
3 closure.

4 And based on the -- the lower  
5 conservatism that was included in that, with the lower  
6 groundwater inflows, meromictic conditions still  
7 established within the pit. So there's a high level of  
8 confidence based on the -- the sensitivities that have  
9 been done that meromictic conditions will form.

10 MS. SACHI DE SOUZA: It's Sachi De  
11 Souza, with the Board. Just to confirm one (1) thing  
12 about the -- the reasonable case; that was reasonable,  
13 but not necessarily the lower end of what is possible  
14 for the groundwater inflows? So you presented what is  
15 reasonable, so in my head, what is likely expected. So  
16 something in the middle of a curve. And you've showed  
17 what will happen at the high end.

18 But what you haven't necessarily showed  
19 is what will happen if it's lower than that reasonable  
20 case.

21

22 (BRIEF PAUSE)

23

24 MR. MICHAEL HERRELL: It's Mike  
25 Herrell, from Golder Associates. I'm not sure if the



1 Board is ready for my response, but --

2 MS. SACHI DE SOUZA: Ready. Very ready.

3 MR. MICHAEL HERRELL: Okay. So the --

4 the sensitivities that we -- we -- that we have  
5 developed, we consider that they're appropriate for the  
6 intended purpose of the DAR to evaluate impacts,  
7 recognizing that, yes, the concentrations may be lower  
8 than predicted. But at that point, the -- the approach  
9 to evaluating water quality may be a bit different once  
10 we have a clear understanding of what the lower end of  
11 the -- the concentrations are.

12 All the modelling that has been done to  
13 date indicates that TDS concentrations that will be  
14 produced will result in a density differences of high -  
15 - higher saline monimolimnion water versus mixolimnion  
16 water of a -- of a lower TDS concentration. However,  
17 if the monitoring -- and this is one (1) of the -- the  
18 key advantages of this project is it allows -- it  
19 facilitates monitoring through not discharging for the  
20 first five (5) years. It allows the opportunity to  
21 reevaluate water quality predictions, and that would be  
22 done if the -- the water quality was actually a lot  
23 less than predicted as part of the future closure  
24 planning and to inform mine planning.

25 MR. BARRY ZAJDLIK: Barry Zajdlik, on

1 behalf of GNWT. Thank you for that, Tom. This next  
2 point is a bit -- well, even flaky, but it really is  
3 driven by the claim that this will -- this meromictic  
4 condition will survive in perpetuity, and that's  
5 seismic activity.

6                   There was a pit -- a water lined pit --  
7 in BC that was affected by an earthquake that was 1,600  
8 kilometres away. It actually induced an internal  
9 seiche and caused a breakdown of the chemocline.

10                   And so my concern here is that even  
11 though this is a low seismic activity area, we're  
12 talking about a long time frame, and there's potential  
13 for it to be destabilized. And in terms of the pit  
14 lake in -- in the Jav pit lake which is expected to be  
15 fish habitat, that could have nasty consequences.

16                   Can you comment on that?

17

18                   (BRIEF PAUSE)

19

20                   MR. MICHAEL HERRELL: It's Mike  
21 Herrell, from Golder Associates. BC is different, a  
22 seismically active area. In -- in the Northwest  
23 Territories it's a very low seismic act -- active zone  
24 and the -- the probability of such an event is  
25 considered very highly unlikely.

1 MR. BARRY ZAJDLIK: Barry Zaidlik. I  
2 think I'll let that go. Thanks.

3 MS. SACHI DE SOUZA: Sachi De Souza,  
4 with the Board. So there was an initial homework  
5 question there and it went a little bit further, and I  
6 -- I don't think that's an additional question. And I  
7 would just like to clarify on what we are asking  
8 Dominion to do as a question.

9 MR. BARRY ZAJDLIK: Barry Zaidlik, on  
10 behalf of GNWT. There's some answers in the appendix  
11 of the IR responses that I'd like to look at before I  
12 come up with a homework question, because it's possible  
13 the answers are there.

14 MS. SACHI DE SOUZA: Okay. Sounds  
15 good.

16 DR. KATHY RACHER: Kathy Racher, for  
17 the Board. But there was the one (1) about the -- the  
18 sentence in the append -- or I don't know if it was an  
19 appendix or annex that had said something that they --  
20 they said was different here.

21 MR. BARRY ZAJDLIK: Barry Zaidlik, yes,  
22 on behalf of GNWT. Yes, there was a disconnect between  
23 what was said here and what's written in the -- of the  
24 Appendix 8G which says specifically that the W2 model  
25 does not include salt exclusion.

1 (BRIEF PAUSE)

2

3 THE FACILITATOR: Okav. With that  
4 clarification, I'd like to assure people that there  
5 will be an opportunity to address the water topic again  
6 tomorrow before we begin the -- the fish topic, if  
7 there are items that weren't addressed today that --  
8 that still need to be addressed. I trust that's okav  
9 with the Developer. You'll have the people available  
10 tomorrow to deal with water matters again.

11 Okav. Well, then I -- I thank everyone  
12 for being here and taking part today. This has been  
13 very interesting for -- for me, not having any active  
14 background in this. So I -- I'm going to go home  
15 tonight and google all these terms that I've been --  
16 yeah, I've got homework. So we'll back at this at 9:00  
17 a.m. tomorrow then. Thank you.

18

19 --- Upon adjourning at 5:05 p.m.

20

21 Certified correct,

22

23

24 Robert Keelaghan, Mr.

25

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