



MACKENZIE VALLEY ENVIRONMENTAL
IMPACT REVIEW BOARD

THOR LAKE RARE EARTH ELEMENT PROJECT -

AVALON RARE METALS INC.

EA1011-001

TECHNICAL SESSION

Facilitator

Paul Mercredi

HELD AT:

Tree of Peace

Yellowknife, NWT

August 14, 2012

Day 1 of 4

1 APPEARANCES

2

3 Paul Mercredi) MVEIRB

4 Chuck Hubert)

5 Stacey Menzies)

6 Shannon Hayden)

7 Cailin Maki)

8 Simon Toogood)

9

10 Marc Casas) MVLWB

11

12 David Swisher) Avalon Rare Metals

13 Donald Bubar) Inc.

14 Henrietta Notzl)

15 Mark Wiseman)

16 Kelly Cumming)

17 Richard Hoos) EBA

18 Jim Stronach) EBA

19 Kevin Hawton) Knight Piesold

20

21 Rick Walbourne) Department of

22 Sarah Olivier) Fisheries and

23) Oceans

24

25

1	APPEARANCES (Con't)	
2		
3	Michael Freeland	)Blackford Lake
4		)Lodge
5		
6	Paul Green	)AANDC-WRD
7	Nathan Richea	)
8		
9	Lionel Marcinkoski	)AANDC-RC
10		
11	Gavin More	)GNWT
12	Bernard Park	)
13		
14	Russell Teed	)GNWT ITI MOG
15		
16	Shafic Khouri	)GNWT ENR
17	Albert Bourque	)
18		
19	Anne Wilson	)Environment Canada
20	Sarch-Lacey McMillan	)
21	James Hodson	)Environment Canada
22		)CWS
23		
24	Shannon Gault	) YKDFN
25	Todd Slack	)

1	APPEARANCES (Con't)	
2	Jake Heron	) NWTM Nation
3		
4	Kate Witherly	) NPMO
5		
6	Pat Simon	) DKFN
7		
8	Stephanie Poole	) NWTSTC/AIMA
9		
10	Carey Sibbaker	) Stantec
11		
12	Ralph Grismala	) ICF International
13		
14	David Connelly	) ILE Royale
15		) Enterprises
16		
17	Laura Jones	) Transport Canada
18		
19		
20		
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1 --- Upon commencing

2

3 THE FACILITATOR MERCREDI: And good

4 morning everyone. Welcome to the technical session

5 for the Environmental Assessment of Avalon's Thor Lake

6 Rare Earth Element Project. My name is Paul Mercredi.

7 I'm an Environmental Assessment Officer with Mackenzie

8 Valley Review Board. I'm the lead Environmental

9 Assessment Officer on this file. To my left is the

10 Senior Environmental Assessment Officer, Chuck Hubert.

11 He is also on this file.

12 Thank you everyone for coming. The

13 Board appreciates everyone's participation in this

14 Environmental Assessment. And technical sessions are

15 a very valuable part of the Environmental Assessment

16 process that the Review Board undertakes. It is an

17 opportunity for face-to-face resolution of any issues

18 and to identify any -- any of those issues that are

19 outstanding and -- and that the Board needs to bring

20 its authority to bear.

21 So having said that, again, it is --

22 this is about resolution. Hopefully we can find that

23 in the next few days. To -- just to make a couple

24 notes, Chuck and myself, or anyone facilitating this -

25 - these technical sessions, we're not decision-makers.

1 We -- we do work for the decision-makers. And
2 essentially these sessions are to collect evidence for
3 the Board to consider within the Environmental
4 Assessment.

5 And so in -- in that light, there --
6 there might be disagreement on certain issues even
7 within this -- this session. We ask, as facilitators,
8 that those disagreements be kept respectful if they
9 are there, again keeping foremost in mind that this
10 entire process is about reso -- resolving some of
11 those disagreements. But again, respect being the --
12 one (1) of the primary objectives here, should there
13 be any disagreement.

14 This is not a hearing. There is -- a
15 hearing is a little more formal. So there will be
16 some order to this session, first and foremost being
17 the agenda topics. Today Avalon will have the mic for
18 most of the morning, and then we will move into water
19 quality for both today and tomorrow.

20 There may be some time during breaks or
21 even after tomorrow afternoon where there might be
22 able to be some offline dialogue. Having said that,
23 this is very much online. There will be transcripts.
24 This -- this session is being recorded, and there will
25 be transcripts. That is for the Board's

1 consideration, to capture the context of the
2 discussion appropriately and -- and so -- so that the
3 Board can consider all of the evidence comprehensively
4 at the end of the Environmental Assessment.

5 The Review Board is committed to
6 efficient and effective Environment Assessment and
7 again, appreciates everyone's participation. A couple
8 of -- we have -- again, this is being recorded. So
9 please speak into the mic clearly; don't shout. The
10 sound tech will indicate whether or not you're
11 speaking too quietly or if you're speaking too loudly.
12 So basically don't eat the mic.

13 Please state your name and your
14 affiliation, who you're working -- or, who you're
15 speaking on behalf of clearly through the mic every
16 time you do speak, because that is important. The
17 transcripts do need to capture who is speaking and for
18 who.

19 A couple of other housekeeping items;
20 often during these technical sessions there -- there
21 may not -- questions -- the developer may not be able
22 to answer questions immediately. If -- and so there's
23 -- we, as staff, try to capture those instances in
24 three (3) ways.

25 One (1) is -- is -- we term as

1 "homework" and we will -- we will -- homework is
2 something that the developer may respond -- they may
3 not be able to respond today, but maybe tomorrow or it
4 may be before the technical session is over. We will
5 term that "homework". And again when the discussion
6 comes to that, if -- if that's what we need to term it
7 as we will call it "homework".

8 "Commitments" refer to changes from the
9 development as it is -- as it has been presented by
10 the developer up to this point. So if there is
11 something that -- if there's a resolution at this
12 point in the Environmental Assessment that basically
13 the developer is comfortable with making commitment to
14 change their development, if that's the conclusion
15 that they've come to, we term that as "commitment" and
16 it becomes part of the evidence that the Review Board
17 considers comprehensibly in the Environmental
18 Assessment.

19 Undertakings are essentially homework
20 that may -- may take a week or so to respond, and
21 basically it's if the developer needs more time than -
22 - than this week to -- to be able to respond. The due
23 date for the undertaking, having been -- needing more
24 time, would be August 31st unless the developer
25 requests a later -- an extension to that -- to that

1 deadline.

2 One thing I will say about both under -
3 - undertakings, homework, and commitments we will ca -
4 - stop and capture the context of the discussion and
5 get the wording, in fairness to the developer, while
6 the discussion is happening and will not revisit it.
7 So that is in fairness to the developer so that -- and
8 -- and also to parties so that it is captured proper -
9 - properly. And -- and so basically we will stop,
10 capture the context, and move on.

11 With that, other housekeeping items, we
12 will take some health breaks periodically throughout
13 the week and today. We will take lunch breaks,
14 roughly an hour, breaking hopefully before noon
15 strikes and then getting underway right at 1:00.
16 Washrooms are to my right, everyone else's left I
17 guess, at the back there. We do have coffee, water,
18 and snacks so just to -- to my right in case anybody
19 is so inclined.

20 What we'll do is I'll turn the mic over
21 to Chuck for any -- if he has any words. We will do a
22 quick roundtable for -- for who is here, and then we
23 will turn the mic over to Avalon. Without further
24 ado, Senior Environmental Officer Chuck Hubert.

25 MR. CHUCK HUBERT: Thanks very much,

1 Paul. I'd just like to remind people as well that the
2 -- there's a conference call attached to this meeting,
3 so there may be some parties on the line. And we'll -
4 - when we do the roundtable we'll ask them to identify
5 themselves. And periodically throughout the day we'll
6 also ask if anybody is online just so that we
7 understand who's -- who is speaking that isn't
8 necessarily in the room.

9 With that, I'll start the roundtable
10 and I'll go to my left. My name again is Chuck
11 Hubert, I'm with the McKenzie Valley Review Board.

12 MR. RALPH GRISMALA: My name is Ralph
13 Grismala. I'm with ICF International. I'm a
14 technical specialist supporting the Review Board in
15 this analysis primarily on the water quality line of
16 inquiry.

17 MR. SIMON TOOGOOD: Hi, I'm Simon
18 Toogood. I'm an EAO with the Review Board.

19 MR. NATHAN RICHEA: Hi, it's Nathan
20 Richea with the Water Resources Division of Aboriginal
21 Affairs and Northern Development Canada.

22 MR. PAUL GREEN: It's Paul Green, also
23 with the Water Resources Division of Aboriginal
24 Affairs.

25 MS. ANNE WILSON: And Anne Wilson with

1 Environment Canada.

2 MS. SARAH-LACEY MCMILLAN: Sarah-Lacey
3 McMillan with Environment Canada.

4 MR. JAMES HODSON: James Hodson with
5 the Canadian Wildlife Service of Environment Canada.

6 MR. ALBERT BOURQUE: Albert Bourque,
7 Regional Environmental Assessment Coordinator with the
8 Government of North West Territories, Environment and
9 Natural Resources.

10 MS. HENRIETTA NOTZL: Henri Notzl,
11 Avalon representative, hydro metallurgy.

12 MR. JIM STRONACH: Jim Stronach, also
13 working for Avalon on the water quality modelling.

14 MR. KEVIN HAWTON: Kevin Hawton, I'm
15 with Knight Piesold, working for Avalon on tailings
16 management.

17 MR. MARK WISEMAN: Mark Wiseman,
18 Health, Safety Environment committee.

19 MR. DAVID SWISHER: David Swisher, VP
20 of Operations for Avalon.

21 MR. RICHARD HOOS: Ri -- Rick Hoos,
22 with EBA, head of the environmental consulting team
23 for Avalon with EBA.

24 MR. MARC CASAS: Marc Casas, from the
25 Mackenzie Valley Land and Water Board.

1 MR. LIONEL MARCINKOSKI: Lionel

2 Marcinkoski with AANDC Environment Conservation.

3 MS. SARAH OLIVIER: Sarah Olivier,

4 with Fisheries and Oceans.

5 MR. RICK WALBOURNE: Rick Walbourne,

6 Fisheries and Oceans.

7 MR. TODD SLACK: Todd Slack, YKDFN.

8 MS. SHANNON GAULT: Shannon Gault,

9 YKDFN, executive assistant for Chief Edward Sangris of
10 Dettah.

11 MS. LAURA JONES: Laura Jones, and I'm
12 with Transport Canada.

13 MS. CAREY SIBBAKEL: Carey Sibbaker.

14 I'm with Stantec.

15 MR. JAKE HERON: Jake Heron, with the
16 NWT Metis Nation.

17 MS. STEPHANIE POOLE: Stephanie Poole,
18 NWT Treaty 8 Tribal Corporation, the Akaitcho IMA
19 office.

20 MR. PATRICK SIMON: Good morning.
21 Patrick Simon, Environment Manager, Deninu K'ue First
22 Nation.

23 MR. LON POTT: Lon Pott (phonetic),
24 Pudo (phonetic) Statistics, GNWT.

25 MR. RUSSELL TEED: Russell Teed, GNWT

1 in minerals, oil, and gas.

2 MR. SHAFIC KHOURI: Good morning.

3 Shafic Khouri, Environment National Resources, GNWT.

4 MS. KATE WITHERLY: Kate Witherly,

5 Northern projects management office.

6 MR. GAVIN MORE: Gavin More, GNWT.

7 MS. KELLY CUMMING: Good morning. I'm

8 Kelly, from Avalon.

9 MR. DONALD BUBAR: Don Bubar,

10 President and CEO of Avalon.

11 THE FACILITATOR MERCREDI: Thank you.

12 Welcome, everyone. And we will go to the

13 teleconference line to -- anyone on the

14 teleconference? Is anyone on the teleconference line

15 listening that can introduce themselves? And once

16 again, thank you everyone, for coming. And without

17 further ado, David Swisher of Avalon.

18

19 PRESENTATION BY AVALON RARE METALS INC:

20 MR. DAVID SWISHER: Great. Thanks,

21 Paul. So I appreciate the opportunity to be here.

22 And since we've already done introductions, we'll get

23 started here shortly with our presentation.

24

25 (BRIEF PAUSE)

1 MR. DAVID SWISHER: Just try not to
2 make it squeal. Yeah. So just -- I just want to
3 state that I see a lot of familiar faces in the room
4 here, which is good. And I look forward to some
5 productive discussions today.

6 So we have a presentation at the
7 request of MVEIRB this morning, and the presentation's
8 going to cover several components. But at the
9 beginning, Don Bubar would like to provide a corporate
10 overview, which I think would be very useful for
11 people in the room or -- or those who maybe don't have
12 as much of a background on the -- the project from a
13 corporate standpoint.

14 So with that, we'll introduce Don Bubar
15 to start the presentation.

16 MR. DONALD BUBAR: Thanks very much,
17 David. Can everybody hear me? I thought it would be
18 useful context for these technical sessions to share a
19 little bit with you about who we are, what we do, why
20 we're here today, a little bit about what these rare
21 earth elements are, why they're important, and also
22 talk a little bit about opportunities.

23 I realize technical sessions like this
24 are to discuss some of the risks associated with
25 natural resource development. With all these risks

1 there are opportunities. And my intention here today
2 is to describe some of the opportunities that this
3 project presents for the Northwest Territories.

4 The rare earth elements are
5 nontraditional commodities. They have never been
6 produced before anywhere in -- in Canada, let alone
7 the Northwest Territories. They are emerging
8 commodities with a very bright future. So we think
9 this project is a very attractive new development
10 opportunity for the North. It would position the
11 North as a leader in the production of these -- these
12 new commodities that are now vital to new emerging
13 clean technology and high technology.

14 I am not a technical expert, so I'll
15 leave that our panel here to discuss some of the
16 technical issues that are the focus of this
17 presentation today. And I'd just like to provide you
18 with a little bit of background on who we are and what
19 we do. Next slide.

20 Just in case there are some investors
21 in the audience, I'm obligated to remind you that you
22 shouldn't rely on any of the forward-looking
23 statements that I make in this presentation, should
24 you be so motivated to be an investor.

25 So these are the various elements of

1 the presentation that we will try to cover today, or
2 this morning, I guess. And I'll look at discussing
3 the first three (3) in overview discussion of rare
4 earth markets, what they are, what they're used for,
5 and a little bit of an overview on where we're at on
6 the project.

7 So we are a public company. Our shares
8 are listed on the Toronto Stock Exchange. We are also
9 listed on the MKT Exchange in New York. This provides
10 some information on the capital structure of the
11 company. Basically we're about 160 million US dollar
12 market valuation right now at current -- at the
13 current share price.

14 The key bit of information on this
15 slide really, for investors, is how much money we have
16 in the treasury. We're a public company that has no
17 revenue at this point in time from operations. We're
18 a development-stage company. We rely on the equity
19 markets to raise capital to fund our operations.

20 And in that regard we're reasonably
21 well funded. We have \$38 million in our treasury
22 right now, with no debt, which we consider sufficient
23 funding to complete the next major milestones on the
24 project which, of course, is a definitive feasibility
25 study on the Nechalacho project.

1 We now have some thirty (30) employees
2 in total in this company. Not that long ago it was
3 one (1) employee, yours truly. So we've had quite a
4 bit of growth over the last few years as -- as we've
5 started to demonstrate what kind of a wonderful
6 opportunity the Nechalacho deposit offers the world
7 generally. And we've been steadily add -- added --
8 adding to our management team.

9 We have two (2) offices, one (1) in
10 Toronto, one (1) in Vancouver, and an emerging office
11 right here in -- in Yellowknife, staffed by Kelly
12 Cumming. Go ahead.

13 This is our board of directors. We
14 have eight (8) people on our board, representing kind
15 of a cross-section of expertise. We have bankers,
16 lawyers, accountants, a technical person in Richard
17 Morland. Two (2) of our directors are actually
18 resident here in Yellowknife. Richard Morland may be
19 well known to many of you here. He has been the
20 president of BHP Diamonds and still does consulting
21 work for BHP. He's a mining engineer.

22 And David Connelly is well known in
23 this community, too, for -- as a consultant to First
24 Nations and government. And, of course, Phil Fontaine
25 is a -- is a well-known name in the community across

1 Canada as a Aboriginal leader, former National Chief
2 of the Assembly of First Nations.

3 So I've got a -- a good cross-section
4 of people to cover most of the areas of expertise that
5 we need at the board level.

6 Our management team has been steadily
7 growing over the last few years. Two (2) of the
8 senior officers of the company are here today in David
9 Swisher and Mark Wiseman. I mentioned Kelly Cumming
10 there earlier.

11 We've had one (1) new addition to the
12 team just in the last few weeks. His name is David
13 Marsh (phonetic). He's filled the position of Senior
14 Vice President of Metallurgy. This was a really key
15 position that we had had vacant for a while.

16 People with the kind of expertise in
17 the extraction of the rare earth elements are very
18 scarce. There are not very many people like him
19 around looking for work. It took us quite a while to
20 recruit him, and we're really pleased to have him on
21 board now to lead us through the remaining development
22 work on the extraction processes to recover the rare
23 earths from the ore. Go ahead.

24 So as I said at the outset, rare earth
25 elements and the rare metals generally are these niche

1 market commodities that are now seeing growing demand
2 from new technology. They have become vital enablers
3 of many of the popular electronic products that we've
4 all come to rely on. Hand-helds, your iPads, laptop
5 computers all make use of rare metals generally and
6 the rare earth elements.

7 As you saw in the first slide, the
8 title slide, the wind vanes, clean technology,
9 renewable energy are -- are the, sort of, big,
10 looming, new demand on the horizon for the rare earth
11 elements. Rare earth elements are used to make the
12 high-strength permanent magnets that go into electric
13 motors and generators that make them more efficient
14 and allow miniaturization of all these electronic
15 products into the forms that we need today.

16 So they have -- traditionally had very
17 small markets, and those markets are starting to grow
18 because of the new demand that we all know is -- is
19 coming from these wonderful modern products. Go
20 ahead.

21 Nechalacho is our flagship project; it
22 accounts for about 98 percent of what we do right now.
23 But we're not just about Nechalacho and the rare earth
24 elements. We've been in this rare metals business for
25 fifteen (15) years now and have a pipeline of other

1 projects that offer opportunities for us to grow our
2 business going forward by developing other compatible
3 commodities elsewhere in North America to ultimately
4 offer our customers a broader range of -- of similar
5 products. Go ahead.

6 So a little bit about some science
7 here. I know there's a lot of scientists in the room.
8 So what are these rare earth elements and why should
9 we be interested in them? And what are some of the
10 characteristics of them that are relevant to these
11 discussions here today?

12 So the -- the rare earths, we've shown
13 rare metals and rare earths here. And it's a bit
14 confusing for a lot of people in the general public
15 because of the double usage of the word "rare".

16 Rare metals is kind of the umbrella
17 term, so that encompasses these rare earth elements
18 which are also known as lanthanides, these guys down
19 at the bottom of the slide and listed on the right-
20 hand side. And the rare metals includes other kind of
21 critical metals, specialty metals such as lithium,
22 rubidium, cesium, zirconium, niobium, tantalum,
23 indium, gallium, germanium, and a -- and a few others.

24 The rare earth elements are -- are
25 unusual though in -- in the periodic table. They are

1 a group of fifteen (15) elements. They only ever
2 occur all together. They're fairly widely dispersed
3 in the earth's crust. They're actually not all that
4 rare, in terms of crustal abundances, but they're not
5 very often concentrated in one (1) spot to allow them
6 to be economically recovered.

7 There's no known toxicity associated
8 with the rare earth elements. They are metals, but
9 they typically occur in an oxide form; hence the use
10 of the term "earths" in how they're described.

11 A couple of important facts about them
12 that are relat -- relevant to the economics of them is
13 that these fifteen (15) elements, they all occur
14 together and -- but where they do occur, they don't
15 occur in equal abundances. And the abundance tends to
16 decrease with increasing atomic number such that the
17 first five (5), known as the "light rare earths", of
18 lower atomic number are typically much more abundant
19 in any one (1) resource than the rest of the series,
20 known as the "heavy rare earths".

21 That didn't used to matter.
22 Historically, most the uses of the rare earth elements
23 were for these light rare earths. But what's
24 happening now is material science innovation has
25 started to find more and more creative ways to use the

1 unique properties of these heavy rare earths, yet few
2 of the known resources in the world have any real
3 endowment in these heavy rare earths.

4 So what the world really needed to come
5 along now was a rare earth deposit that had a higher
6 proportion of these heavy rare earths to serve this
7 growing need. Those deposits are extremely rare, and
8 that's the attribute that Nechalacho has that makes it
9 such an attractive development opportunity, is its
10 unusual endowment in these much more scarce heavy rare
11 earths. Go ahead.

12 So this slide shows graphically how the
13 relative abundance of the heavy rare earths and light
14 rare earths in our deposit at Nechalacho compares with
15 some of the other better-known examples around the
16 world. Mountain Pass is the historic producer in the
17 United States, being developed by Molycorp. Bayan Obo
18 is the big producer in Inner Mongolia and China.
19 Mount Weld is a development-stage project in
20 Australia, as is Nolans.

21 And what this shows is the bottom of
22 the bars is the five (5) light rare earths, and the
23 flesh colour at the top is the heavy rare earths. And
24 you can see at a glance what a dramatic difference
25 there is in abundance in the heavy rare earths in

1 Nechalacho compared to these other better-known
2 deposits. So that's the -- that's the important
3 attribute.

4 The other important factor to
5 appreciate with the rare earth elements is that right
6 now the supply side is totally dominated by China.
7 Most people are aware of that now. That's been in the
8 news quite a bit in the last few years, how China
9 controls this market. And it is a reality. Right now
10 there is no significant production of rare earths
11 anywhere in the world outside of China.

12 And what's been happening is, is China
13 has grown economically and in -- is industrializing --
14 and this is the case for other commodities too --
15 internal demand for rare earths is now growing at a
16 very rapid rate. It used to be that China would
17 produce many commodities greatly in excess of internal
18 demand. But that's all changing now. As China
19 continues to rapidly grow, their internal demand for
20 all commodities is growing very quickly and
21 outstripping their ability to supply their own needs.

22 And that's now happening with the rare
23 earth elements as well. And as a result of that,
24 they're starting to apply restrictions on the exports
25 of rare earths to other consumers around the world to

1 make sure that they look after domestic requirements
2 first.

3 And, of course, this creates a really
4 big problem for everyone around the world that was
5 using rare earths and relying on China to supply them,
6 because they don't have any other alternative place to
7 go to get them if China decides they can't supply them
8 any -- any further.

9 So that's the -- the opportunity that's
10 presented itself to companies like us, is to become
11 that new source of supply for rare earths for
12 consumers around the world outside of China. Go
13 ahead.

14 There's quite a bit happening in that -
15 - that space these days. I'll show you a little bit
16 about how the prices have evolved in the next slide,
17 but China continues to take action to manage the indu
18 -- industry more carefully there.

19 Historically it's been a very
20 disorganized industry with lots and lots of very
21 small, kind of cottage industry operations that were
22 operated extremely inefficiency -- inefficiently with
23 serious environmental consequences associated with
24 that.

25 So they have been very diligent in

1 trying to consolidate the industry to get rid of all
2 these inefficient operations that were creating the
3 environmental issues and reorganize the industry to
4 make it more efficient, from a production standpoint.

5 While they do that, that has reduced
6 some of the production, creating an even greater issue
7 on the supply side. And that has had a predictable
8 effect on -- on prices, because demand is going up and
9 supply is actually going down. So that pushed prices
10 up quite significantly over the last few years,
11 further highlighting the opportunity that's presented
12 itself for new producers around the world.

13 There is some consolidation happening
14 in the industry right now. Molycorp acquired a
15 Canadian company called Neo Materials with -- that had
16 most of its operations in -- in China, recently that
17 allowed them to diversify downstream into some of the
18 aspects of the business that involved manufacturing
19 the secondary products. Go ahead.

20 So I was talking about prices. This is
21 in chart form. And we have the light rare earths at
22 the top, heavy rare earths at the bottom. These are
23 current prices. I just updated this for -- from the
24 website, Metal-Pages, that -- that tracks these
25 prices, last week.

1 A couple of important things to
2 understand about rare earth prices; rare earth
3 elements are not a mainstream commodity. They are not
4 exchange-traded. So these are indicative prices. The
5 -- they are sold under contract between producers and
6 consumers. So the prices are negotiated based on what
7 people think the overall supply/demand situation in
8 that marketplace is.

9 So these are prices that are not based
10 on posted bid and ask in an auction market. They are
11 prices that are -- are reported based on a survey of
12 in -- of market participants, finding out what they
13 have been doing recently. So it give you an idea where
14 the prices are. But that's not -- they're not typical
15 quoted prices as you're used to seeing for COMEX-
16 traded commodities, like gold, for example.

17 All of this trade is in China. The
18 prices that are quoted are on the basis of being
19 exported from -- from China. And what you can see at
20 a glance is that the heavy rare earths, because
21 they're much less abundant in a typical deposit,
22 attract much higher prices than -- than the light rare
23 earths.

24 Over the last year, we saw tremendous
25 price volatility because of the -- what was happening

1 in China, in terms of restricting supply in the face
2 of increasing demand. And then some of these prices
3 went ballistic, actually.

4 Lanthanum and cerium, the two most
5 abundant light rare earths, used to trade for sort of
6 four (4) or five dollars (\$5) a kilo in 2009 and went
7 up to some hundred and forty (140), hundred and fifty
8 dollars (\$150) a kilo in -- last summer, a huge
9 increase that obviously wasn't well received in the
10 marketplace by the consumers that were used to paying
11 four (4) or five dollars (\$5) a kilo.

12 And that actually was not a healthy
13 development for the long-term sustainability of the
14 market, in that consumers that were forced to pay
15 these higher prices were obviously motivated to look
16 for substitutes. And in some of these applications,
17 there are alternatives that they -- that they can go
18 to.

19 But fortunately, the prices have
20 started to come down to what we believe are more
21 sustainable levels in the longer term. Lanthanum and
22 cerium will never be in short supply. It's the --
23 really these heavy rare earths that are the key ones
24 that continue to be in short supply, because most
25 deposits do not have sufficient endowment to meet the

1 current demand. Go ahead.

2 We talk about rare earths as a group,
3 and this is -- but really they -- each rare earth is
4 its own commodity with its own supply demand
5 fundamentals. And because when you produce them you
6 have to extract the whole group of rare earths as a
7 group and then refine them later to isolate them into
8 their individual forms, creates these imbalances in
9 the supply.

10 And all deposits, as I showed you
11 earlier, lanthanum and cerium are the most abundant.
12 And so this chart shows how the -- the demand is
13 expected to evolve over the next few years.

14 And with the new supply coming into the
15 market from emerging new producers, such as Molycorp
16 and Lynas, there will be new supply of the light rare
17 earths into the market but not so much of the heavy
18 rare earths, because those deposits do not have much
19 in that mix.

20 So the forecast is, is that for the
21 light rare earths there should be increased supply,
22 perhaps in excess, in 2016, but the heavy rare earths
23 will continue to be in short supply. So if you're
24 going to enter that market, you really need to have
25 the heavy rare earths to offer. And that's, again,

1 the key attribute that we have at Thor Lake that makes
2 is such an interesting development opportunity.

3 Briefly on the supply chain, one (1) of
4 the main differences with rare earth elements compared
5 to more familiar commodities is there's an extra step
6 involved in the process in refining to produce a
7 saleable, useable product.

8 In the mining industry, generally we're
9 used to an underground mine or open pit mine, and then
10 a mill that concentrates the mineral, and then a
11 further process that gets the metal of interest out
12 into a -- into a useable form.

13 In the rare earths business, because
14 you've got these fifteen (15) separate elements that
15 all come out together, there's a further step
16 afterwards called separation refining required to
17 isolate each one (1) of the individual rare earth
18 elements. So that adds another layer of processing
19 and cost to their extractions.

20 So there are four (4) steps involved to
21 producing a product that we can sell. And then after
22 that, there is further refining required to turn it
23 into the forms that are used in some of the
24 applications that -- that I showed you earlier.

25 So these steps are -- each require a

1 separate processing facility. And therefore, it's
2 quite a bit more costly to extract and refine the rare
3 earth elements than it is for other more familiar
4 precious metals and base metals.

5 And that partly explains why there
6 isn't any production of them outside of China right
7 now, is because as long as China had an excess supply,
8 nobody was particularly motivated to invest the
9 billion dollars or so that's needed to build a rare
10 earth production situation if there was a threat that
11 China could bring vast new supply into the
12 marketplace.

13 And so no one was willing to take that
14 risk until recently, when it's become more clear that
15 China no longer represents that -- that kind of threat
16 because of the huge growth and internal demand for
17 these products inside China.

18 So what we're seeking to do is these
19 first four (4) steps, and these first three (3) would
20 be done in the Northwest Territories, as David and
21 others will be elaborating on later. Go ahead.

22 So this slide is -- talk about the
23 opportunities a little bit more in terms of what it
24 might mean to Canada Northwest Territories in
25 particular once this operation gets going. This was

1 based on a study that was done by a consultant using
2 the data generated for our 2010 pre-feasability study,
3 so already out of date to some extent, as the model
4 for the definitive feasibility study will be different
5 than this.

6 But you can see at a glance that this
7 will generate enormous revenues for the -- for the
8 Government of Canada, and at least half of that will
9 flow directly to the Northwest Territories, and
10 enormous new opportunities in terms of employment and
11 spinoff benefits to providers of goods and services to
12 -- to the industry.

13 And this is based on just that initial
14 model for the pre-feasibility study. We've since
15 expanded the resource, so we know we're not going to
16 be limited to an eighteen (18) year mine life. This
17 is a very, very large deposit that offers a multi-
18 generational development opportunity to the Northwest
19 Territories. This -- this operation, once it's off
20 the ground, as long as there continues to be demand
21 for the rare earth elements, could be in operation for
22 many, many decades and be ultimately a pillar of the
23 economy going forward for the North -- Northwest
24 Territories.

25 And we think these numbers are actually

1 conservative. As the demand grows, the size of the
2 operation could -- can grow. We're not limited by the
3 size of the resource in terms of how much we could
4 produce. And therefore, the operation could grow in
5 size and also in terms of its wealth-creation
6 opportunities for Northerners -- Northerners and Canada
7 generally. Go ahead.

8 It is a competitive marketplace though.
9 Because these are not exchange-traded commodities and
10 you have to negotiate contracts with consumers, it
11 means you're in more of a -- a competitive business
12 than what you're used to in the gold or the copper
13 business. So you have to go out and find customers
14 and get them to commit to buying your product in order
15 to access the capital to actually build this operation
16 -- an operation like this.

17 Because there's quite a bit of
18 interest, we're not the only company trying to do
19 this. And therefore we're in kind of a competitive
20 situation, where there's an opportunity to capture
21 that available market share outside of China, which is
22 available basically on a first-come, first-serve basis
23 to the first new producer that can emerge to supply
24 that -- that need.

25 Because we started early, as I'll show

1 you in a minute, we're -- we consider ourselves one of
2 the leaders in that race. But we have to be wary that
3 we've got to keep things moving along here or
4 otherwise we run the risk of others catching up and
5 passing us and perhaps usurping that -- that
6 opportunity.

7 But the fact that we've got such a good
8 deposit puts -- with the high proportion of heavies
9 gives us one (1) strong advantage. And the fact that
10 we're -- we started early and we're already at that
11 feasibility study stage is very important because it
12 allows us to now enter into serious discussions with
13 customers about committing to buy these -- these
14 products, which is essential to being able to secure
15 the financing to actually build this product at the
16 end of the day.

17 And we've also done enough work on the
18 -- on the metallurgy now that we think we've got a
19 viable flow sheet for -- for recovering these that
20 we're now taking through the pilot plan stage and into
21 design for feasibility. That puts us well ahead of
22 others as well. Go ahead.

23 So kind of where we're at and where
24 we're going, very quickly; obviously, we'll get into
25 this in more detail. We started our community

1 engagement with First Nations and Aboriginal groups
2 here in the North very early, right when we first
3 started on the project in 2006. And we have one (1)
4 comprehensive accommodation agreement that we've
5 signed fairly recently with Deninu K'ue First Nation
6 at Fort Resolution, and we're working on finalizing
7 the remaining agreements that we've committed to doing
8 in the next little while.

9 We -- we are working very hard on
10 finding customers. As I said, finding those customers
11 is key to being able to find the financing to build
12 this. We're -- we're looking at capital expenditures
13 in excess of a billion dollars to build all elements
14 of this project. That's a lot of money for a company
15 that has a market valuation of \$160 billion.

16 So we're not going to be able to do
17 that all on our own. We need partners, both at the
18 community level and at the business level and,
19 ideally, a strategic investor that's a consumer of
20 these to partner with us on the project to show the
21 banks and financial institutions around the world that
22 we really do have committed customers willing to buy
23 this material to allow us to secure that financing.

24 So having all the other elements of the
25 project kind of fall in place within that timetable of

1 working with con -- customers and -- who want to know
2 when they're going to actually receive the material at
3 the end of the day is critical to getting this project
4 off the ground.

5 So we're working towards getting this
6 process completed by the first quarter of next year,
7 around the time that we'll be trying to finish off our
8 definitive feasibility study. And hopefully the land-
9 use permits will fall in behind that fairly quickly so
10 that we can show the banks and the customers that the
11 project's moving ahead on a predictable timetable that
12 will allow everybody to forecast when they're likely
13 to see that first -- first production come out of the
14 ground.

15 And in order to be able to do that, we
16 need to get started on construction work at the site
17 by the middle of next year. So that's kind of the
18 sort of important elements of the process that we're
19 in right now, from a timing standpoint.

20 And lastly, this is kind of our overall
21 project schedule. I think there's one (1) more slide
22 there, David. There we go.

23 So this is -- goes back to 2005. I
24 like to show this in this format. It's kind of a busy
25 slide, I realize. But going back to 2005 shows you

1 when we started and just how long of a process it is
2 to get one (1) of these operations off the ground. We
3 started in 2005. And in a best-case scenario right
4 now we're looking at having initial sales to offer our
5 customers in 2017. That's a twelve (12) year timeline
6 in order to get one (1) of these operations off the
7 ground.

8 And I would submit to you that's
9 actually doing it fairly quickly, believe it or not.
10 It sounds like a long time, but with all the
11 exploration and development work, feasibility work,
12 and environmental assessment work that we're involved
13 in now, and then the construction and commissioning
14 process, it just takes quite a long time to get one
15 (1) of these projects off the ground, which means you
16 need committed investors early on that see the upside
17 to stick with you to make sure that you can get to the
18 finish line.

19 So we'll talk a bit more about some of
20 the elements of the schedule as going forward, but I
21 guess as I've elaborated already, in order to get that
22 -- to meet that date, we've got to start this
23 construction work and commissioning sort of in the
24 latter part of this year, which means getting some of
25 that project financing in place perhaps even before

1 we've got all the 'I's dotted and 'T's crossed on our
2 feasibility study.

3 So that's a -- a considerable
4 challenge, and it really revolves around this part of
5 the work here, market development and securing that
6 strategic partner that's willing to come in as an
7 investor and -- and help back the project and use
8 their strong balance sheet to convince the banks that
9 this a -- a project worthy of -- of providing debt
10 financing to.

11 So I think I can leave it there, and
12 I'll be happy to answer any questions either now or as
13 the day proceeds. Thank you for your attention.

14 THE FACILITATOR MERCREDI: Thank you,
15 Mr. Bubour. If there are any questions -- if there
16 are not any questions, we'll move directly to David
17 Swisher and -- with his presentation.

18 And I'm not seeing anything, so I will
19 hand the mic over to David. And we do request a copy
20 of that presentation for the public registry.

21 MR. DAVID SWISHER: I'd expect nothing
22 less. All right. So I'm just going to take you
23 through a little bit of our current initiatives and
24 we'll then get into the project and start talking a
25 bit more on the specific technical items that I think

1 everybody's waiting for here. So thanks to Don for a
2 very informative corporate and high-level overview.
3 Oh, my name is David Swisher with Avalon Rare Metals.

4 And so just for those of you who maybe
5 aren't as familiar with the area, this just shows a --
6 a nice area of the -- the NWT surrounding Great Slave
7 Lake. From Yellowknife we're 100 kilometres south and
8 east of -- of Yellowknife. And from the Nechalacho
9 project, it's composed of a couple components here in
10 the NWT. We have the Nechalacho site, which will host
11 a mine and a concentrator. And then on the south side
12 of the lake at the old Pine Point site, we'll have our
13 hydromet plant located between Fort Resolution and the
14 Town of Hay River. And then the railhead for CN for
15 railing items, both supplies to the north and products
16 to the south, runs out of Hay River.

17 And -- so as I mentioned, our project
18 is a bit unique than other projects in that we've got
19 several components of our project. We have a -- a
20 mine and a mill, which I think most everybody is -- is
21 used to seeing. We also have some secondary
22 processing in the hydrometallurgical plant, which is
23 really a -- a first here in the Northwest Territories,
24 which can open up a lot of opportunities. And then we
25 have a separation plant.

1 And those components, as you can see by
2 the data here, the intention is to mine underground at
3 2,000 tonnes per day. That's somewhat of a moderate
4 production rate. We will crush that material
5 underground. We'll convey it to the surface. In the
6 surface it will go through a concentration flotation
7 process. It will get upgraded at a five (5) to one
8 (1) basis.

9 That material then, the waste material,
10 will report to two (2) streams, report to a paste fill
11 plant and report to the tailings management facility,
12 while the concentrate gets loaded into intermodal
13 containers and then shipped across the lake to the
14 hydromet plant via barge during the summer season.
15 Nechalacho mine and mill will employ about two hundred
16 and twenty-five (225) employees.

17 At the hydrometallurgical plant in Pine
18 Point, will receive the material in those containers.
19 That material will go through a, basically what we
20 call an acid-bake process. That process extracts a
21 good portion of our light rare earths and half of our
22 heavy rare earths. That will get dried and packaged,
23 because we don't want to lose that valuable product.
24 And that will get trucked to the Hay River railhead
25 and then railed south to the separation plant.

1 The remaining product that comes out of
2 the acid-bake process is a residue. That residue will
3 also get trucked to the Hay River railhead, and it
4 will get shipped south for further sales or
5 refinement.

6 And at the hydromet plant, we'll employ
7 about sixty-five (65) employees. And that number --
8 both of these numbers, obviously, are subject to some
9 variance, but we certainly don't see those numbers
10 decreasing.

11 And the separation plant, right now, in
12 most of our -- our latest information disclosure,
13 we've indicated a Southern US or the Gulf States
14 region for the separation plant. And that's
15 predominantly because of the close supply of the high
16 quantities and high expensive reagents that are
17 required for the separation plant.

18 So some of our development activities
19 to date, as Don indicated, we've completed a -- a pre-
20 feasibility back in 2010, which was the first pre-
21 feasibility to a 43-101 standard that had ever been
22 released to the public for a rare earth project. And
23 then a year later, in 2011, we decided to do an
24 updated pre-feasibility. And it wasn't until May -- I
25 think May this year that another rare earth competitor

1 finally came out with another pre-feasibility.

2 So, essentially, there was a two (2)
3 year period where we were kind of the leaders in the
4 industry. And we still look at ourselves as the
5 leaders in the industry with regards to not only the
6 technical aspects of the rare earth process, but also
7 in terms of our advancement in -- in getting to the
8 markets.

9 We are working on a definitive
10 feasibility study, where we've engaged SNC-Lavalin to
11 work on this feasibility study for us. SNC-Lavalin is
12 a -- is a leader in EPCM, engineering, procurement,
13 construction, and management. And so they were a very
14 good fit to work on the feasibility study for us.

15 And that feasibility study is going to
16 focus on the Nechalacho mine and flotation plant, the
17 Pine Point hydrometallurgical plant, as well as the
18 incorporation of the separation facility in the
19 Southern US.

20 And as I mentioned, EPCM bids, that is
21 usually the next stage after feasibility. And we
22 anticipate once we complete the feasibility study, or
23 we get close to completing the feasibility study, we
24 actually have to start work on the EPCM stage very
25 early next year.

1 And as Don indicated in his
2 presentation, you know, we are -- we are hopeful that
3 we'll be able to start some of the early works
4 construction activities next summer. And that -- that
5 is in order for us to meet the market requirements in
6 that schedule that Don showed you, to get supply into
7 the marketplace by the end of 2016, beginning of '17.

8 So it's a -- it's a bit of a race that
9 a lot of the rare earth companies are in right now.
10 And we feel we're in a -- a very good position to --
11 to get that share of the marketplace, but it's a very
12 important component to the project.

13 And then, of course, this year --
14 towards the end of this year and into next year we'll
15 be adding on more personnel. As Don mentioned, we
16 have thirty (30) people already with Avalon. And
17 we've -- we're going to have to increase that as we
18 advance to the production stage and construction.

19 And then our community engagement and -
20 - and product marketing, those are ver -- two (2) very
21 important aspects to the -- the project advancement.
22 And we're working with our Akaitcho First Nations each
23 step of the way with this project as well and we're --
24 we're quite happy and pleased with that progress.

25 And I think everybody in this room

1 probably knows where we're at. We're in technical
2 sessions. But it's certainly been a road starting
3 with the Land and Water Board transitioning into the
4 Environmental Impact Review Board. And, of course,
5 now we're in the technical sessions. And, you know,
6 we're hopeful that we'll be able to have positive
7 discussions today to answer any and all questions that
8 come up.

9 We feel we have a very good project and
10 we're very fortunate in a lot of ways that I'll
11 explain in -- in my project update here in just a few
12 moments. We did get a new five (5) year permit for
13 the drilling activities at site in July of -- of last
14 year. And that continues to occur but on a limited
15 basis right now, mainly for infill definition drilling
16 of the deposit, not necessarily the nec -- any more
17 exploration drilling. We -- we have a very
18 sustainable deposit in what's there right now. The --
19 the goal now is just to get that deposit into an
20 operating state.

21 We've completed -- through the help of
22 Stantec/Det'on Cho, as well EBA, we've completed four
23 (4) years of baseline work, and Etcholacho (phonetic),
24 and so we -- we feel quite good that we have quite a
25 lot of environmental baseline work, maybe a bit more

1 than -- than what you would normally see, but we have
2 a very good handle. And the experts that we have here
3 today have a very good handle on that environment.

4 And, of course, we have a land use
5 permit to extend our airstrip for the safe import of
6 employees. And due to just some of the timing, we
7 hope to start that construction next summer as well.

8 Our community engagement is very
9 important. And, of course, with the project being
10 located in Akaitcho territory we're -- we're very much
11 engaged with our primary First Nation partners, being
12 that of Deninu K'ue First Nation, the Yellowknives Dene
13 First Nation, and Lutsel K'e Dene First Nation, as
14 well as our Metis partners through the Northwest
15 Territory Metis Nation, North Slave Metis Alliance.

16 And so what's important is that we've -
17 - we've first -- we've completed our -- our first
18 accommodation agreement with the Deninu Kue First
19 Nation, and we're -- we're very close with the other
20 two (2) aboriginal partners. And we're very pleased
21 to -- to have them become a part of our -- our project
22 from a sustainability standpoint so that we can both
23 benefit and we can both make sure that we're
24 comfortable from an environmental aspect throughout
25 the project life.

1 There have been a lot of training
2 initiatives that have happened already through the
3 existing exploration and drilling program through a
4 lot of -- whether it's safety training, a lot of
5 safety training through first aid, but also through
6 fire safety, through camp safety. We've done driller
7 -- supported driller training. So we've got a --
8 we've got a lot of successes in supporting the
9 training initiatives which we're going to carry right
10 into construction and operations.

11 Employment at the site has been very
12 good from an aboriginal participation. In 2010 and
13 2011 we averaged about 50 percent at the exploration
14 camp. Of course, that was in construction operations
15 we'll be endeavouring to -- to maintain high numbers
16 of employment from our aboriginal communities to help
17 build sustainability within those communities as well.

18 And we have a lot of business contracts
19 with our aboriginal partners, whether it's through
20 Stantec, Stantec/Det'on Cho, Feraco (phonetic),
21 whether it's through the Dene Suline Corporation in
22 Lutsel K'e, and also the core box (phonetic) business
23 that Deninu K'ue has developed and providing us
24 through this project. So we're quite proud of -- of
25 those items that help build that sustainability in the

1 communities.

2 Our corporate social responsibility. I
3 think this is very important context for the people in
4 the room because we're not just another developer
5 trying to ramrod this process to get a project running
6 because we're more concerned about the bottom dollar.

7 Yes, we are concerned about the bottom
8 dollar, I'm not saying we're not, but we are also very
9 committed and very concerned with our cor -- corporate
10 social responsibility. And I think we've shown that
11 here by 1) with Don Bubar's participation and his
12 actions in PDAC and, of course, receiving that award
13 in 2010 for environmental and socially responsible
14 sustain -- acti -- continued activities in PDAC,
15 particularly on the aboriginal front, has been very
16 important and -- and is a -- a key value driver for
17 the company.

18 What's also very important is that even
19 at an exploration stage this company was the first to
20 invoke the E3 Plus Program that PDAC put out and
21 that's a sustainable program for responsible
22 exploration.

23 Well, we've continued that as we get
24 closer to a construction phase into the Mining
25 Association Can -- of Canada's towards sustainable

1 mining initiatives. And there again, it's -- it's
2 another commitment that the company has made in its
3 CSR approach.

4 We did early on, which was unprecedented
5 (sic) for a company of its size, two (2) years ago we
6 did a -- we had Jantzi-Sustainalytics do a
7 sustainability performance report on the company. And
8 we did this so that we could understand where we could
9 improve, what can we do, how can we set ourselves up
10 for the construction and operations phase. So I think
11 our actions can dictate that we are not just another
12 fly-by-night company coming in to try to rape and
13 pillage but we're a sustainable company that wants to
14 build sustainability in the regions in which we work,
15 whether that be in the NWT or whether that be
16 elsewhere where we have other projects. Ideally, we
17 would like to start in the NWT.

18 We've also completed a comprehensive
19 sustainability report in 2012 and that is due in most
20 part to Mark Wiseman, our VP of sustainability, and
21 that was a huge commitment by the company as well
22 during this stage of our development. Normally, you
23 don't see that except in operating operations. And so
24 Mark's been a wonderful addition to the team in
25 helping keep things in front of us but also make sure

1 that we are following the path of our commitments when
2 it comes to corporate social responsibility.

3 And -- and I -- like I mentioned, this
4 is the cover which is also on the public registry of
5 our sustainability report. I would encourage
6 everybody to read that. I think it gives a very good
7 background of our commitments as a company and our
8 commitments as being a responsible developer in the
9 NWT.

10 And just as a -- you know, people ask
11 what sustainability is, well, it's a development that
12 meets the needs of the present without comprising the
13 ability of future generations to meet their own needs.
14 And I think that sums things up quite well for us in -
15 - in our commitments we've made here in the NWT as
16 well as the commitments we're making to our Aboriginal
17 partners in their communities in helping them build
18 sustainability in their communities and understanding
19 the social issues in those communities and partnering
20 with them.

21 And lastly, again, I think it's
22 important, you know a lot of people can stand up here
23 and talk about the good stuff and the nice stuff but I
24 think I would just ask you to remember what, in the
25 past, our actions have been. Through all the

1 initiatives we've done in the social responsibility
2 area but also in some of the construction activities
3 that have already taken place at the Nechalacho site.

4 This airstrip was added in 2010 by our
5 aboriginal partner company, Det'on Cho Logistics, and
6 that airstrip -- basically what we had determined to
7 do instead of developing a quarry and denuding another
8 area we -- we isolated an opportunity from the old T-
9 zone where they had a lot of waste piles over there
10 that were just on the surface to do progressive
11 reclamation. We weren't required to do that but we
12 determined it was going to cost us just a little bit
13 more but we could reclaim an area and utilize that
14 material to build this airstrip, and it just made
15 sense. And so we -- we did that.

16 We also hauled out at expense from the
17 barging companies three (3) of these trailers that
18 were left over from the -- the earlier years of
19 exploration activities in this area, and we re-
20 purposed and restored these three (3) trailers for
21 potential campsites and visitors and that sort of
22 thing.

23 So the area has been cleaned up
24 extensively since Avalon took over, and that's
25 predominantly led by the leadership in Avalon and its

1 commitments to that sustainability that we're
2 committed to.

3 And this just shows a -- just a
4 diagrammatic, if you will, shot of the existing camp.
5 Now, of course, this is not where the activities are.
6 I'll show you where the -- the construction activities
7 are, but that's the current drilling camp at the site.

8 So to go in a project overview I -- I
9 didn't want to get into too much of the resource, but
10 what I did want to state is that we did just release
11 an updated resource, and that resource was done by an
12 independent third-party, Roscoe Postle Associates out
13 of Toronto. They basically updated our resource so
14 that we have a total of 72 million tonnes of measured
15 and indicated.

16 Measured is very important. It's the
17 highest degree of confidence that you can achieve in a
18 deposit, and that's important for our feasibility
19 study and it's also important for future financing
20 efforts. So we're very happy to have a -- a high
21 amount of -- of measured and to be able to add to that
22 from the future drilling -- or the drilling that we're
23 currently doing right now as well.

24 And just as a -- as a note, when Don
25 said that there's sustainability in this deposit we no

1 longer have to do any exploration drilling, he's
2 absolutely correct. For a twenty (20) year mine life
3 at our 2,000 tonnes per day we need approximately 14
4 1/2 million tonnes for twenty (20) years.

5 And we've defined 72 million tonnes
6 that are qualifiable under 43101 to be upgraded into a
7 reserve. And that 72 million tonnes is basically
8 incorporated in these yellow highlighted areas,
9 looking at this plan map.

10 So you have Thor Lake, the existing
11 camp facilities, the existing airstrip, and then the
12 deposit itself in this area. And of course, this red
13 dot -- dashed line is the area in which we know that
14 the basal zone, the ore body of interest, extends out
15 to these areas.

16 So it's -- it's a very unique situation
17 with this type of deposit, and it makes us the largest
18 rare earth deposit outside of China. It makes us the
19 third largest niobium deposit in the world and the
20 second largest tantalum deposit in the world.

21 So there's a lot of positives that we
22 have going for us for this deposit. The key for us is
23 to getting it into a construction operation state and
24 eliminating the risks when we go out for financing.

25 So from a project stand and an

1 overview, this is basically a -- a modelled look. The
2 only existing items we have are the exploration camp
3 and the existing airstrip. So what we've modelled in
4 here -- oops, sorry, we've modelled in the flotation
5 plant, what that might look like in the area in which
6 it's planning to be constructed.

7 The underground decla -- decline, which
8 is collared here and accesses the ore body, which is
9 in this island between Thor Lake and Long Lake, the
10 existing road from the barge facility that's out there
11 that runs up to the plant site, and then the airstrip
12 extension which it extends on out this way.

13 And the tailings facility, basically we
14 have tailings pipeline that would run along the road
15 system with minor upgrades, and I'll get to that in
16 just a moment. The underground operation, just from a
17 cross-sectional viewpoint for those of you who haven't
18 been underground, it's always good to see, well, what
19 does that mean. We basically drive a decline at 15
20 percent gradient to access the basal zone. The basal
21 zone is the zone -- high-grade zone of interest that
22 contains the majority of heavy rare earths.

23 That a very important aspect of this
24 project. We will mine through conventional drilling
25 and blasting, drift and fill, but also with a

1 combination of long hole stopes.

2 And we can do that in this ground
3 because the long hole stopes and the ground conditions
4 itself are very solid ground. So through the
5 extensive geomechanical work that we've had support
6 through Knight Piesold doing for us, we can open up
7 large areas which is conducive to meet the needs for
8 the -- the productivity rates that we're suggesting.

9 We're also going to be crushing this
10 material underground. Typically, what you would see
11 is you would see crushers at any mine on the surface
12 and handled on the surface.

13 In our situation we wanted to minimize
14 the footprint given that we're in a -- in an area
15 that's surrounded by a lot of ak -- lakes. So to
16 minimize that footprint we looked at several factors
17 and we decided to put this crushing station
18 underground.

19 It's quite an extensive crushing
20 station we're going to have underground, but what it
21 does for us is it minimizes the -- the inclusion of
22 dust in the air emissions on the surface, because we
23 can easily control it underground. It allows us to
24 minimize the amount of energy that we have to use on
25 the surface by building additional buildings, outside

1 covered storage for stockpiling, because we're have --
2 we'll have to heat -- and also all of our power will
3 come from diesel generation on the surface.

4 So by having these -- this crusher
5 underground, we basically don't have to heat it. It
6 will generate its own heat through the working
7 operations and the motors and things that are
8 underground. The -- the other benefit is the sound.
9 All the crushing activities being underground, you
10 won't hear anything on the surface.

11 So it's a -- it's a good, a very good
12 benefit. The other benefit to that is that hauling
13 material to the surface requires stockpiling on the
14 surface. And, as you know, in the climates during the
15 winter months that material can become clumpy and
16 lumpy and freeze together. And you end up oftentimes
17 having to re-handle again and again, just to get it
18 loosened up and broke up.

19 Then we will crush that material down
20 to a minus 15 millimetre product and that will get
21 conveyed to the surface to the flotation plant. From
22 the flotation plant -- and this is Henrietta's
23 expertise, the material goes through a typical
24 rodmill/ballmill arrangement. From there it goes
25 through the typical -- it's just like any other

1 flotation plant you would see, except the difference
2 being we're using slightly different reagents to
3 extract and float the rare earths of interest, and
4 also separate out the -- the waste products.

5 And the waste products then that get
6 developed from the flotation plant, a portion of those
7 waste products will get pumped out to the proposed
8 tailings facility. Now, just to note, and I think we
9 put this in our IRs, the tailings facility original
10 design was this larger area that incorporated what we
11 indicated was a polishing pond here. And we had
12 indicated that if it was necessary we would also
13 construct this polishing pond.

14 So I think that's an important point
15 for my next slide here, because through continued
16 optimization efforts throughout the two (2) plus years
17 that we've been in the EA process, we've been able to
18 actually reduce the amount of tailings that report to
19 this area and put a -- a larger portion of those with
20 the paste fill plant underground. And that's all been
21 confirmed through the extensive studies that Golder
22 did for us on our feasibility work for the paste fill
23 plant.

24 So that is a positive for the project.
25 And so what that allowed us to do is reduce the size

1 of the tailings management facility here. It reduces
2 the amount of berms that we have to build, or barriers
3 if you will, from an elevation difference -- I think
4 our highest elevation point -- and Kevin will correct
5 me if I'm wrong, was about 8 metres, 8 to 10 metres at
6 its highest dam height.

7 Well, now we're going to be -- I think
8 the highest dam height is 4 metres below that. So
9 we're not talking too much higher than -- than the
10 room that we're standing in in terms of our bid -- our
11 -- our dams.

12 And I think there's a perception out
13 there -- and, of course, not a perception, but a
14 reality, when you look at tailings management
15 facilities all over the world, you see these large
16 dikes and dams that are built. And that's where the
17 concerns come as you -- you get years and years of
18 operation and you fill up those dams, the concern is
19 about dam failure.

20 Because our dams -- dams, if you will,
21 are berms that will be constructed here on this side
22 of the lake, because this is all a natural topography
23 here, they are very shallow. And so the risk is, you
24 know, extraordinarily low compared to tailings
25 facilities that are out there today.

1 On top of that, we follow all the
2 Canadian standards and the dam standards for the
3 designs, which Kevin Hawton can expand on if -- if
4 necessary later on in the discussions.

5 And so we also -- what that meant then,
6 is it meant we reduced the amount of coring that we'd
7 have to do to supply material for that dam. It almost
8 becomes non-existent that we have to do that. We are
9 going to quarry for the air strip expansion here this
10 next summer. And that quarry actually -- instead of
11 where we had originally proposed to have a quarry
12 outside of the tailings facility. We actually can now
13 do a lot of quarrying within the tailings facility.

14 So not only can we increase the size of
15 the tailings facility, but the rock that we need for
16 the construction activity, say the airstrip extension,
17 is now contained within the tailings facility.

18 So it's just we continue to tweak
19 things and optimize things as we go, as you would
20 expect us, I'm sure, to do, you know, understanding
21 that we're in a lengthy process. We're not just going
22 to stop with what we presented in the DAR. We're
23 going to continue optimizing, and that's what we've
24 done. And I think we're -- we're very proud of this
25 fact as well.

1 The -- the benefit too, and I think,
2 Ralph, the benefit for you is that we chose this
3 tailings facility. We did extensive research in this
4 entire area. And we chose this facility because hands
5 down it was the best area. It provided a natural
6 topographic barrier here, so it mi -- minimized the
7 amount of material that we needed for construction,
8 and we'd have to denude other areas for, and it would
9 last the entire twenty (20) year proposed mine life.

10 It's available for future expansion if
11 we are to continue the operation. And the two (2)
12 lakes that it encompasses, Ring Lake and Buck Lake,
13 are non fish-bearing, and so it had the minimum effect
14 -- minimum environmental effect of any other area that
15 we looked at for a potential tailings facility.

16 And we couldn't have asked for a better
17 area because from the -- the plant site here we pump
18 our tailings to the tailings facility here. We now
19 have incorporated a polishing pond within this
20 facility. So not only did we reduce the size, but now
21 we have incorporated a polishing pond. And then that
22 polishing pond will discharge into Drizzle Lake, which
23 is known to not support fish habitat.

24 That will naturally flow into Murky
25 Lake and naturally flow back into Thor Lake. And

1 we're picking up our freshwater down here in Thor
2 Lake. So what we've created is this -- what we've
3 called this closed loop system, if you will.

4 It -- it's an ideal situation for us
5 that I -- I think we've very fortunate to have in this
6 area because the Thor Lake watershed is also a massive
7 watershed. So the precipitation levels that drain
8 into the Thor Lake watershed are quite high. So
9 there's a natural dilution that occurs every year in
10 this area.

11 So we were very fortunate not only in
12 the tailings location to optimize the tailings but
13 also have the area in which we can create this type of
14 -- of closed loop system which during operations makes
15 it easier for us to monitor and control.

16 I think that's it. I think I've
17 pounded that one long enough. So when we come back to
18 the flotation plant, as I mentioned, we're mining. We
19 did reorient the plant a bit, and it allowed us to
20 minimize the footprint. So we -- we minimized the
21 size of the footprint. So instead of coming out
22 towards the lake more we were able to actually keep it
23 more clo -- closer to the road and the infrastructure
24 closer to the existing road area, so it minimized some
25 of the -- the footprint for us, which was good. It

1 also allowed us to put the accommodation facilities
2 closer to the airstrip for ease of -- of employees
3 walking back and forth to the -- to the plant.

4 Mining at 2,000 tonnes per day from the
5 underground. As I mentioned before, we will generate
6 about 1,600 tonnes per day of waste, and of that waste
7 we have 600 tonnes per day of tailings that will
8 report to the tailings facility and about a thousand
9 tonnes per day that will report to the paste fill
10 plant.

11 And this was an optimization effort
12 that we were able to do with the test work that we did
13 from the Golder study. And I think what's important
14 is the items that we put in the DAR early on, knowing
15 that we were going to continue to optimize, were --
16 were items that we felt were very conservative, okay,
17 because we knew we were going to continue to do
18 optimization efforts. And I think this is a good
19 example of that optimization effort, because before,
20 we had this at about a 50-50 split, 800 tonnes
21 reporting to tailings, 800 to -- to the paste fill.
22 And through the optimizations that we've done with
23 Golder and the rheology testing, the cement testing,
24 we now can -- can get a good portion, a much higher
25 portion of that waste rock and ship it back

1 underground as paste fill. That's a positive for us,
2 a positive for the project as well.

3 The remaining 400 tonnes per day of
4 concentrate, that will get loaded into these 35 to 40
5 tonne half-height intermodal containers. So these
6 containers are no more than 1.3 metres high. I think
7 we could -- well, I could maybe barely stand up in
8 them. Kevin could probably stand up in them. And so
9 these containers are -- are fairly easy to handle and
10 they're stackable -- safely stackable, so that we can
11 also try to minimize the footprint.

12 A lot of what we've done within the DAR
13 in terms of the area for the footprint for stacking
14 was based on a single stacking scenario. We're now
15 planning to double-stack these to try to minimize the
16 area as much as we can as well.

17 From the flotation plant then the 400
18 tonnes per day in those containers will be brought
19 down the existing road. So this is the existing road
20 system out here which will be upgraded during
21 operations. And it will be stacked here in the area,
22 pre-staged, prior to the barging area. We've stayed
23 away from the shoreline here for the Great Slave Lake
24 for good reason. We want to maintain this treed cover
25 and we don't believe there's any reason to denude any

1 more than what's already there and what's already
2 being utilized for the barging facilities that we're
3 bringing or utilizing currently for the drilling
4 program.

5 So during operations the barging
6 envisioned at this stage and working with some of the
7 barge companies we've gone out to four (4) different
8 barging companies for competitive pricing to -- to
9 work out who's going to do the barging for us. And
10 what we've come back with is the fact that we can
11 actually reduce this footprint here even more.

12 Yet again another optimization effort
13 on the barging side where we originally had shown a
14 thousand series bar -- barge moored up against the --
15 the beach and then a 1500 series barge moored up
16 against that loading barge. Now it appears that we
17 can eliminate this loading barge, which is less
18 infrastructure, and the barge -- the 1500 series barge
19 of interest can come straight into the beach and we
20 can load front end. And so it basically makes for
21 less infrastructure if you will at the seasonal barge
22 facility and it makes it -- from an operation
23 standpoint it makes it a bit more logistically easier
24 and safer to -- to manoeuvre and manage.

25 And then the barge trips we would do is

1 basically two (2) to three (3) barges per tug, two (2)
2 tugs operating continuously, and it's about a two (2)
3 day cycle time. So the number of containers we need
4 at the -- the 400 tonnes per day is about thirty-two
5 hundred (3200), thirty-five hundred (3500) containers.
6 And those containers -- all those containers equate to
7 a year's supply of -- of concentrate and that will get
8 shipped across the lake within a period of sixty (60)
9 days. And the barging season is a hundred and twenty
10 (120) days. So we've allowed ourselves a contingency
11 in there for weather concerns, also for any mechanical
12 concerns with the tugs.

13 One (1) other point I'd like to note as
14 well for clarification, and we'll talk about it in day
15 3, I believe, accidents and malfunctions with regards
16 to the barging, is that each one (1) of these barges
17 are going to be tied independently of each other. So
18 when we're -- we're hauling barges across the lake,
19 you know, the chances of -- of those barges becoming a
20 problem are -- are less than the chances of it being a
21 problem for the tugs are -- are much less. And the
22 experts that we're talking to, obviously they have no
23 concerns with -- with this scenario.

24 This just shows a nice little, if you
25 will, an aerial picture of what it will look like if

1 you're, say, up in a plane flying by at a thousand
2 feet in terms of the -- the barging location, the --
3 the container storage area, the intermediate fuel
4 storage area, and then the road. You can see the
5 existing road going up to the flotation plant site.

6 And then as we ship the product then we
7 barge that product across the lake. What's important
8 to note is the barge companies have indicated there
9 are two (2) potential routes, depending on weather,
10 that they can take. There's a northern shore route
11 that comes across the northern shore and then cuts
12 straight to the -- down to Pine Point. Or they can
13 hop through a little bit of the islands here and come
14 across and down. At the end of the day that's the
15 routes that the mariners have indicated are -- are the
16 safest routes from the Nechalacho site to Pine Point.
17 And then from Hay River when we have resupply in every
18 year at the beginning of the season, that resupply
19 will come from Hay River and will generally track on
20 this trend for the barging routes.

21 So this map here was provided by the
22 mariner experts in terms of what they recommend our --
23 our routes be. I know our -- our previous maps, you
24 know, showed more of a direct line, which is not the
25 case.

1 And then when we get to the Pine Point
2 side of the lake then we basically have this setup
3 where we have three (3) low-keel barges that will be
4 moored to dolphins, and the barge will be offloaded
5 and the containers will be staged here prior to being
6 shipped 12 kilometres to the hydrometallurgical plant
7 site.

8 Excuse me. This just shows the
9 orthographic drawing from the proposed barge area.
10 The fact that the infrastructure is already there,
11 this road is already existing and you can -- at this
12 time of year you can drive all the way out to the --
13 the point already.

14 We also, from a change, we originally
15 had looked at putting the hydromat plant in this area,
16 but we had recently, working in discussions with the
17 GNWT, we moved the plant over here closer to the
18 substation and in a much larger denuded area of the
19 site.

20 And what this shows is it also -- and
21 I've got another map that shows the proximity then to
22 the L-37 proposed tailings facility. And this just
23 shows a nice little modelled picture of the -- what we
24 had envisioned the hydromat plant to look like, the
25 existing substation, this is the old Cominco tailings,

1 the roadway that runs out here and all the way down to
2 the dock facility, and of course the Great Slave Lake.

3 So narrowing in, when we moved that
4 plant facility we did it for a couple reasons. We --
5 we moved it within the GNWT MACA lands, as we continue
6 working with the GNWT on -- on what that will equate
7 to in terms of being on MACA lands and being more
8 controllable.

9 We reduced the powerline infrastructure
10 by about 3 1/2 kilometres by locating within about 500
11 metres of the existing substation that's there. We
12 reduced the tailings piping that would be required
13 from that prior location to this location by about 4
14 kilometres.

15 So now we're -- we're, I think, about
16 less than a klick to the L-37 tailings facility.
17 We're, again, in close proximity to L-37, and we're
18 also in closer proximity and reduced the fresh water
19 supply that we propose to pull out of J44 open pit.

20 And so that all of those areas just, in
21 moving the plant into this area, made a lot more sense
22 once we got clarification from MACA that they weren't
23 going to charge us a lot more in -- in taxes. That's
24 really what it boiled down to.

25 And then from the hydrometallurgical

1 plant I mentioned earlier we have two (2) products.
2 We have what we call a light rare earth precipitant
3 and we have the acid bake residue. And both will be -
4 - the precipitant will be packaged up, will be placed
5 into those intermodal containers, and will be hauled
6 the 90 clicks to the Hay River railhead. The acid
7 bake residue will be bulk loaded into trucks, the
8 trucks will be tarped. That material will be moist
9 and that material will be hauled to the CN transload
10 facility outside of Hay River and then shipped. Both
11 products will get railed south. And the product
12 shipping equates to about 417 tonnes per day that
13 we'll be shipping south.

14 So by doing that -- I think one (1) of
15 the other things I wanted to -- to note, by doing that
16 -- in the original DAR we basically had a good portion
17 of that residue being discharged into the tailings
18 facility, L-37.

19 And by doing that we're able to now
20 reduce that amount. So the life of the L-37 tailings
21 is not only for the full project life, but could go
22 well beyond that. So the amount of waste discharge in
23 -- in the L-37 at the tailings facility has been
24 reduced quite a lot.

25 So, Paul, I'm not sure what time it is

1 if you want to take a break. We've got a few more
2 slides maybe to go on this WQOs and water quality. Do
3 you want to take a quick break on that?

4 THE FACILITATOR MERCREDI: Yeah, we'll
5 take a quick break. I'm quite sure that will generate
6 some questions. So we'll take a ten (10) minute
7 health break and come back and have David continue the
8 presentation. Okay.

9

10 --- Upon recessing

11 --- Upon resuming

12

13 THE FACILITATOR MERCREDI: Okay, so
14 we'll get underway again. And we'll turn over the mic
15 to -- before we turn over the mic to -- back to David,
16 we'll field any questions for the Avalon team on what
17 has been presented so far before we -- before David
18 delves into the water quality topics.

19 So are there any questions from anybody
20 in the room for David on what has been presented so
21 far?

22

23 (BRIEF PAUSE)

24

25 QUESTION PERIOD

1 THE FACILITATOR MERCREDI: And not --
2 and let the record show nothing -- nothing yet. We'll
3 go to the teleconference line and I -- and is there
4 anybody on the line? I'll -- I'll ask anybody who
5 might be on the line to -- to speak up. And the
6 record -- let the record show no one yet. With that,
7 we'll turn the mic over to -- sorry? Go ahead, Paul.

8 MR. PAUL GREEN: It's Paul Green with
9 the Water Resources Division. Just a quick one (1).
10 In your slides you suggested that the acid bake
11 residue is going -- is all going to be shipped south,
12 but there was a release -- just recently were you
13 looking at a hydrochloric acid cracking of that
14 residue?

15 I guess -- so, well I understand that,
16 you know, that may come later as the project
17 progresses, but I'm just wondering if you could
18 comment on, I guess, the plan for that?

19 MR. DAVID SWISHER: Yeah, sure. The -
20 - the original plan -- oh, David Swisher. The
21 original plan, Paul, was to incorporate in the
22 separation plant in the southern US, a cracking
23 facility. And that requires the use of hydrochloric
24 acid or -- or potentially use hydrochloric acid. And
25 so we were looking at what's called a caustic cracking

1 to do that.

2 We're -- we're still investigating
3 those options, but that would be coupled with the
4 separation plant and would not be in the NWT.

5 THE FACILITATOR MERCREDI: Thank you.

6 And, just as a reminder, we will kind of -- just
7 because the recording can't necessarily tell, or the
8 transcripts, who -- who is talking, so we will be
9 reminding everyone with the names. And, Nathan, you
10 had a follow-up?

11 MR. NATHAN RICHEA: Hi, it's Nathan
12 Richea with the Water Resources Division and
13 Aboriginal Affairs. I just had a quick question. I
14 was just looking at the mine life. Currently, you're
15 looking at around eighteen (18) years and -- and
16 that's still what the project is proposing, I guess at
17 this point? Because I know there's reserves for
18 beyond that.

19 But as part of this application and
20 this assessment I just wanted to clarify that it's
21 around eighteen (18) years, is the mine life?

22 MR. DAVID SWISHER: David Swisher,
23 here. Yeah, eight (8) -- eighteen (18), twenty (20)
24 years, basically. The cash flow models, the
25 feasibility, is all being developed based on a twenty

1 (20) year.

2 THE FACILITATOR MERCREDI: Anne...?

3 MS. ANNE WILSON: It's Anne Wilson

4 with Environment Canada. Just jumping around a bit in

5 topics. Could you say a little bit about the residue

6 that's going to be shipped out to the railhead and the

7 -- the form that that takes? It sounds to me like

8 it's going to be in open truck boxes that are tarped.

9 Is there any risk of escape from that transport?

10 MR. DAVID SWISHER: It's very similar

11 to what we've dealt with, I think, Anne, in -- in

12 prior projects that we've been a part of, with regards

13 -- David Swisher again -- with regards to the

14 transport. And, of course, we've -- if you look into

15 our commitments, we're committed to the same type of

16 commitments we made with that prior project in terms

17 of transporting with the tarp. The products will be

18 moist, the acid bake residue will be moist.

19 But maybe to go into a little bit more

20 detail on the product itself, I'll turn it over to

21 Henrietta Notzl, and she can explain a bit more

22 detail.

23 MS. HENRIETTA NOTZL: Henri Notzl,

24 Avalon. Yeah, the product itself will be exactly the

25 same material only with a sulphate in it. And

1 therefore, it will be diluted down. So whatever came
2 in from the flotation plant will then be processed
3 using sulfuric acid, and that will create a sulphate,
4 and that will increase the weight.

5 So there is no radioactivity or -- it's
6 below the transport sur -- transportation limits for
7 radioactivity for uranium and thorium.

8 UNIDENTIFIED SPEAKER: Yeah, I -- I
9 think to add to that, it -- it's -- the material right
10 now that we've identified, it's an inert product,
11 Henri?

12 MS. HENRIETTA NOTZL: Henri Notzl.
13 Yes, that's correct.

14 MS. ANNE WILSON: Anne Wilson. Just
15 to -- my last question that -- what type of moisture
16 content would you expect it to have?-

17 MS. HENRIETTA NOTZL: Henri Notzl. It
18 will be about 15 to 25 percent.

19 THE FACILITATOR MERCREDI: Okay. If
20 there are no further questions, we will move on to
21 David, continuing his presentation.

22

23 NECHALACHO SITE WATER QUALITY OBJECTIVES, WATER
24 MANAGEMENT AND TREATMENT

25 MR. DAVID SWISHER: Okay. Thank you.

1 I think we've just got a few slides now, going into
2 the water -- David Swisher -- going into the water
3 quality aspect of it. And so I'd like to hand the mic
4 over to Rick Hoos, EBA Engineering

5 MR. RICHARD HOOS: Okay, good morning,
6 everybody. It's Rick Hoos, with EBA, as Dave
7 mentioned. I was kind of hoping the lights might be
8 on for a second because the -- the few slides that
9 we're providing here are face on. There they are.
10 And I wanted to give a little bit of a background to
11 how we got to these site-specific water quality
12 objectives before we got going.

13 And a lot of this impetus frankly came
14 from you folks at the Board and -- and AANDC in
15 particular, who were asking early on -- well, not
16 early on. In about April of this year questions
17 started to arise about site-specific water quality
18 objectives. And initially we thought, Gee, it seems a
19 bit premature to be talking about those. But we are
20 obviously convinced that it was important that we do
21 address this topic.

22 And so again, at the suggestion of the
23 Board, we -- we initiated contact with both AANDC and
24 Environment Canada sitting at the table here with us
25 to see what kind of progress we could make in

1 discussions related to site-specific water quality
2 objectives.

3 We had a couple of telephone conference
4 calls. We generated minutes from those meetings.
5 They've all been provided to the Board. We also
6 provided an initial set of site-specific water quality
7 objectives for the Avalon project which was submitted
8 to the Board on May 18th, 2012, in the form of a
9 letter from Avalon to the Board.

10 And they had tabulated numbers for
11 proposed site-specific water quality objectives that
12 should be -- that could be considered for this
13 project. We were also proposing in that letter that
14 Drizzle Lake being the first downstream water body,
15 which has been found to -- admittedly it's connected
16 to the next lake below, which is Murky.

17 But in terms of fish populations, it
18 really hasn't had any in the lake itself, although I
19 believe in the last year of three (3) years of trying
20 to find fish in the lake, I believe one (1) pike was
21 found, one (1) juvenile fish was found in the stream
22 leading from Murky to Drizzle. So it's possible that
23 fish could inhabit the place -- the lake.

24 But we also know that it -- it goes
25 anoxic in the winter period, so if a fish was

1 unfortunate enough to be in that lake in the
2 wintertime, it would probably perish from anoxia.

3 So anyway, the -- the downstream water
4 body, Drizzle, we propose as perhaps a mixing zone
5 leading to the definition of site-specific water
6 quality objectives at the outlet of Drizzle as it
7 moves beyond downstream into, eventually, Thor Lake.

8 Now, since that May 18th letter, we
9 have continued to evaluate the results that we had
10 provided. And in preparation for this technical
11 session, Dr. Jim Stronach, who is with us today and
12 led the modelling efforts for this work, he did an
13 independent check on -- on the model parameters, the
14 assumptions and so on.

15 And, surprisingly, we found one (1)
16 other little glitch that we since rectified. And so
17 the -- the material that we're going to be providing
18 to you here today is the latest, greatest material.
19 We are confident in these results, but they do differ
20 a bit from the -- the numbers that were provided in
21 the letter dated May 18th.

22 The one (1) thing I would like to
23 stress though, and a message that we've been conveying
24 all along, is that Avalon feels very confident with
25 the quality of its effluent. Frankly, it's -- it's of

1 exceptionally good quality, such that virtually all
2 parameters are below existing CCME criteria for the
3 protection of aquatic life in the downstream receiving
4 environment. And it -- and the effluent itself, the
5 anticipated effluent, for most parameters is al -- is
6 already below the CCME criteria that we're going to be
7 talking about here as site-specific water quality
8 objectives.

9 And I'll show that to you as I get up
10 now and discuss the -- the results. Initially I'll
11 talk about the basic metals, the standard metals that
12 are usually regulated or considered for regulation.
13 That'll be the first set of tables, or the first
14 table. The second table will address the various rare
15 earth elements that are associated with the effluent.
16 And the third table will talk about some of the
17 nutrient parameters and a couple of other items that
18 the Board specifically asked for further clarification
19 on as well.

20 So without further ado, I think we'll -
21 - we can now turn off the lights, and I'll stand up
22 and we'll have a look at these tables.

23 It's a lot of information on the
24 screen, so apologies for that. But what I would like
25 to focus on initially is this is the same decanted --

1 five (5) day decant effluent that we've been working
2 with throughout this test program and throughout the
3 duration of the DAR. And these are the concentrations
4 that were identified for these various parameters in
5 the effluent and this is the information we provided
6 to the Board before.

7 What has changed though is because the
8 site-specific water quality objectives are based on
9 micrograms per litre, rather than milligrams per
10 litre, we've converted everything to micrograms per
11 litre. So some of -- you know, like for instance,
12 aluminum looks like a fairly big number. It's
13 actually .6 milligrams per litre, but it converts to
14 620 micrograms when you see it in this manner.

15 But in comparing these numbers here for
16 all these different effluent parameters with the CCME
17 guideline values there, before it even leaves the
18 tailings pond or the tailings management facility,
19 with the exception of aluminum and iron, all these
20 other parameters are already below the CCME guideline
21 value identified on the right side of the screen
22 before it even proceeds through dilutions downstream.

23 What we're all -- what -- and I'll get
24 back to aluminum and -- and iron in -- in a moment.
25 But I also want to point out that what we've done here

1 is we've provided additional information on background
2 values of these parameters in micrograms per litre in
3 Drizzle Lake based on several years of sampling by our
4 friends a Stantec.

5 And the modelling results, which is
6 projected twenty (20) years into the future and
7 considers the fact that water is being recycled and
8 there's baseline values in the water and that --
9 that's being added to by what's coming out of the
10 tailings management facility, has resulted in these
11 kinds of model values over a twenty (20) year period
12 of time based, again, on this initial set of
13 information.

14 And I'm going to be discussing why we
15 are confident that the two (2) numbers that seem a
16 little bit high here can be, in fact, very simply
17 reduced to further -- to much lower values than those
18 at -- at the -- at the outset.

19 We also then introduced Thor Lake,
20 because that's really the -- the first significant
21 fish-bearing lake in the system. And again, we've
22 identified the background values that are currently in
23 the system over several years of analysis and the
24 modelled twenty (20) year values.

25 And then we have this column here where

1 we propose -- Avalon proposes site-specific water
2 quality objectives based on Drizzle Lake outlet of
3 these numbers, which then corr -- compare. In many
4 cases they are essentially the same as the CCME
5 values.

6 But anyway, turning back to aluminum
7 and iron, we all can't help but notice that the
8 modelled twenty (20) year value in micrograms per
9 litre coming out of -- potentially coming out of
10 Drizzle Lake could, if nothing else happened to the
11 effluent before it is finally released, end up with a
12 number in the order of 148 micrograms per litre, which
13 is a little bit over the CCME guideline value.

14 Iron is -- is further complicated by
15 the fact that in Drizzle Lake in particular, it has a
16 very variable concentration of iron throughout the
17 year with very high values under the ice when it's
18 anoxic in the winter, and reverting to numbers that
19 are comparable to what's in Thor Lake in the spring
20 and summer months once oxidation of the iron has taken
21 place again. But the fact is, using the numbers we've
22 -- we've considered which are averaged, you end up
23 with a momentary value of nine seven two (972).

24 But what I want to stress here is that
25 this is based on a five (5) day decants concentration.

1 The actual time that the effluent will be in the
2 tailings pond will be longer than five (5) days. And
3 we -- we have determined that it's very likely that
4 the aluminum and iron that are showing up as elevated
5 here are simply due to the fact that they are in the
6 fine particulate form that re -- remains suspended in
7 the water during a five (5) day decant test.

8 But in reality, and I know Henrietta
9 can speak to this further, the company has been
10 working at not only improving its treatment
11 capabilities to -- to recover more of the REEs, as
12 many of the REEs as they can, but at the same time
13 they've also been looking at ways of cleaning up the
14 water, both for plant use, and that has benefits in
15 terms of the actual quality of the water coming out of
16 the plant and going into the tailings pond thereafter.
17 And we -- we are currently still doing a lot of work
18 on that as a company and it's -- it is -- it's pretty
19 obvious that it won't be difficult to knock the
20 aluminum and iron down to lower levels by simply
21 taking out more of the suspended particulates before
22 it leaves the tailings pond.

23 The key message though is still the
24 same. Virtually all of these parameters can achieve
25 the CCME guideline values in the receiving

1 environment. And that would include aluminum and
2 iron. And that is the going imposition on that.

3 It -- it should also be noted that for
4 one (1) particular parameter, vanadium, there is
5 actually no CCME criterion, but we did use the Ontario
6 water quality guideline value for -- for that
7 particular element.

8 I may just ask the audience whether
9 people want to ask questions at this point or whether
10 we want to go through the three (3) or four (4) slides
11 that are associated with this presentation and then
12 ask questions. My preference is to go through all the
13 slides, by the way...

14 THE FACILITATOR MERCREDI: It looks
15 like you had a question?

16 MS. ANNE WILSON: Thanks, Paul. It's
17 Anne Wilson with Environment Canada. I have two (2)
18 questions. The first is: Has the update to the
19 modelling taken into account the change in the project
20 description that the water recycle system has been
21 eliminated? Because you've mentioned about
22 concentrating.

23 MR. RICHARD HOOS: Yes, that's a good
24 question, Anne. Oh, sorry. Rick Hoos, sorry.

25 It's -- it's correct in saying they

1 will no longer -- there are no plan -- no longer
2 planning to recycle water directly from the tailings
3 management facility back into the process plant. But
4 instead of that, what they're doing is they're doing a
5 lot of internal recycling of the water before any of
6 it actually goes to the tailings management facility.
7 And not only are they internally recycling it, but
8 they will be internally, within the plant, treating it
9 to remove and recycle the reagents and things like
10 that.

11 And that all has the -- the benefit,
12 from the preliminary information that we've seen, of -
13 - of producing even lower values in the outgoing
14 effluent than the kind of numbers that we're seeing
15 here. But unfortunately, we don't have that
16 information yet. It's just what we understand is
17 happening.

18 So there will still be a lot of
19 recycling, but it's taking place inside the plant
20 instead of ex-plant.

21 MS. ANNE WILSON: Okay. Thanks for
22 that. My other question is to -- Anne Wilson,
23 Environment Canada -- to do with the number proposed
24 for chromium. Do you have information that it is in
25 the hexavalent versus the -- the three (3) versus the

1 six (6) form to use the higher CCME value?

2 MR. RICHARD HOOS: I can't answer that
3 right now, but we can certainly check into that for
4 you and get back to you on that.

5 THE FACILITATOR MERCREDI: And that
6 was Rick Hoos.

7 MR. RICHARD HOOS: Okay, sorry.

8 THE FACILITATOR MERCREDI: Does Avalon
9 have an idea of -- of timeline for when they could get
10 back for that? This -- it could be homework or an
11 undertaking --

12 MR. RICHARD HOOS: What do you mean?
13 The -- the --

14 THE FACILITATOR MERCREDI: -- in that
15 sense.

16 MR. RICHARD HOOS: The question on
17 chromium? Rick Hoos here.

18 THE FACILITATOR MERCREDI: Yes.

19 MR. RICHARD HOOS: I'm -- I'm hoping
20 by speaking with Henrietta and others we can get back
21 to you certainly by tomorrow maybe, and if not by
22 tomorrow, we'll give you an update at that time,
23 but...

24 THE FACILITATOR MERCREDI: Okay, we'll
25 call that homework number 1 for our purposes. And

1 we'll -- we'll stop for a second and -- and get some
2 wording. Simon is our -- is -- is our scribe for --
3 for that purposes. So do you have wording for that?

4 Okay. And Simon will rea -- read the
5 question to see if he's captured it.

6 MR. SIMON TOOGOOD: It's Simon
7 Toogood, with the Review Board. From my
8 understanding, it was just for Avalon to check whether
9 chromium was hexavalent or trivalent for the purposes
10 of the -- sorry, what are you calling this chart here?
11 This is --

12 MR. RICHARD HOOS: Site specific water
13 quality objectives.

14 MR. SIMON TOOGOOD: Okay.

15 MR. RICHARD HOOS: Proposed site
16 specific --

17 MR. SIMON TOOGOOD: Proposed, okay.

18 MR. RICHARD HOOS: -- water quality
19 objectives.

20 MR. SIMON TOOGOOD: So for proposed
21 site specific water quality objectives.

22 Is that fair enough?

23 MS. ANNE WILSON: It's Anne Wilson.

24 Just maybe to add: for the purposes of determining the
25 appropriate CCME guideline to be used.

1 MR. RICHARD HOOS: Okay. Well,
2 perhaps we -- we can move on. Rick Hoos again, with
3 Avalon. We'll move on to the discussion related to
4 rare earth elements. But before showing you the
5 table, I just want to explain a little bit about some
6 of the information that was used to derive the numbers
7 in the table.

8 Just coincidentally, this is -- this
9 seems to be a growing area of interest, because at the
10 same time as we were being asked questions about REEs,
11 new papers were coming out on REEs. And one (1) parti
12 -- one (1) paper in particular was a paper put out by
13 the Wilfrid Laurier University on the eco-toxicity of
14 the fifteen (15) lanthanide rare earth elements.

15 And I might suggest, as -- or indicate,
16 as Don Bubar has also indicated, the rare earth
17 elements are -- are incredibly difficult to
18 solubilize. And even in bio-acidity tests that have
19 been done, they -- they weren't able to use, sort of,
20 your basic REEs. They had to be in a form of a salt
21 such that they could actually manage to get some of
22 them into solution. But in general, they're highly
23 insoluble, as this report indicates, and, therefore,
24 are difficult to find in the free form in the -- in
25 waters.

1 But anyway, this paper, amongst other
2 things, appear -- looked at fifty-si -- five hundred
3 and seventy-seven (577) reports and other articles.
4 They tabulated the chronic and acute toxicities, both
5 for fresh waters and marine waters, fresh waters being
6 more of greater interest here. We were already -- we
7 had already developed our proposed site specific water
8 quality objectives for the REEs before we actually saw
9 this paper. And we ended up using a lot of the same
10 literature, of course, that they -- they reviewed as
11 well. And in particular, we -- we used a lot of the
12 information generated by the EPA in the United States
13 for -- for looking at these kinds of elements.

14 So basically, with that information as
15 the background that we worked with, it was also
16 obvious that there were no actual CCME criteria for
17 rare earth elements. However, we did use the CCME
18 methodology for trying to come up with a number for
19 site specific water quality objectives for this
20 project. And that is des -- described in the CCME
21 documentation by taking essentially the lowest effect
22 level that has been identified in any kinds of tests
23 that have been done and dividing that number as an LC-
24 50, for instance, or -- the numbers that we ended up
25 using were -- were largely derived from tests done by

1 the EPA using a small amphipod called hyalella,
2 amphipod being a fresh water shrimp.

3 And they expose them to seven (7) day
4 chronic tests in -- in both soft water, which was
5 about a hardness of eighteen (18), and hard water, a
6 hardness of about a hundred and twenty-four (124).
7 And they got dramatically different results, with the
8 hard water resulting in much higher concentrations
9 being required in order to -- to trigger any effect on
10 the shrimp.

11 So -- so basically, to be highly
12 precautionary and conservative, we opted to -- to
13 choose -- to select the test results for the ext --
14 incredibly soft water that they tested at about
15 eighteen (18).

16 And I might mention, the typical water
17 hardness of Thor Lake is around 200 milligrams per
18 litre of hardness, and Drizzle Lake is about two
19 hundred and seventy-five (275) hardness. And that's
20 even harder, of course, than the one twenty-four (124)
21 that was also tested by them.

22 Anyway, we used these highly
23 conservative numbers for soft water and a chronic
24 test, and we took those numbers and -- and divided
25 them by ten (10) to come up with the numbers that

1 you're going to see in the table here.

2 But as the bottom line here indicates,
3 even though we've selected those very protective
4 numbers, it is also recognized that water hardness and
5 alkalinity will have a significant effect on reducing
6 any potential toxicity associated with an REE, and
7 that should be factored in as we move forward to
8 develop these site specific water quality objectives.

9 So then here's the updated table. And
10 again, you -- you will see right at the top, it's
11 amazing how alphabetically that one (1) of the trouble
12 makers end up right at the top. It's kind of
13 interesting that way. But nevertheless, cerium. It
14 stands out as being a -- a concentration in micrograms
15 per litre again, of about one thirty-nine (139) in
16 that -- in that solution that we tested some time ago.

17 We are very confident that this number
18 will come down in the final effluent that will be
19 produced for this project. I don't have that
20 information today to -- to support that statement.

21 Using these numbers here, in the case
22 of cerium, we ended up with a modelled twenty (20)
23 year value in micrograms per litre in Drizzle Lake of
24 about thirty-one point eight (31.8). And that, of
25 course, is higher than the proposed site specific

1 water quality objective that we came up with, which
2 was this highly, highly, conservative precautionary
3 number based on tests done in EPA with very soft
4 water, which is actually not representative of this
5 condition here. Anyway, it is higher than that
6 number.

7 For most of the rest of the parameters,
8 you'll find that the modelled values are below the
9 proposed SSWQs that we've identified here, and we're
10 very comfortable and confident that the final effluent
11 will be able to achieve the proposed numbers that
12 we've come up with in this last column.

13 And as I mentioned, these are not CCME
14 guideline values, because none exist, but these were
15 based on -- the -- the calculation of these numbers
16 was based on the approach taken to produce values for
17 CCME guidelines.

18 So I don't know if there's any point in
19 going through each of the individual numbers, but we
20 can come back to these numbers at a -- at a -- as --
21 as we go through the next day and a half, I guess. I
22 just wanted to show you a little bit about the effects
23 of hardness. Sorry.

24 THE FACILITATOR MERCREDI: Anne, you
25 had a question?

1 MS. ANNE WILSON: It's Anne Wilson.
2 Would it be possible to get a copy of that table over
3 lunch time to have a look at it a little more closely?

4 MR. RICHARD HOOS: Absolutely. That
5 would be no problem at all. We just pulled out a
6 couple of examples. We could have thrown lanthanum on
7 there. We could have thrown all -- all fifteen (15)
8 of the REEs on here.

9 And consistently what you'll see is
10 that at the very soft waters that were tested and that
11 we used for the development of these proposed site
12 specific water quality criteria, you -- you end up
13 with these kinds of numbers at the eighteen (18) for
14 the -- at a hardness of eighteen (18), the LC-50 for
15 cerium was 32 micrograms per litre. At a hardness of
16 a hundred and twenty-four (124), it was six hundred
17 and fifty-one (651).

18 Similarly for the other ones, one
19 ninety-one (191) versus nine twenty-nine (929)
20 depending on water hardness, one twelve (112) versus
21 seven seventeen (717) depending on water hardness.

22 And the real point I want to make here
23 is that this is actually softer water than exists at -
24 - at Nechalacho which is closer to two hundred (200)
25 to two fifty (250). So there is a big difference

1 whether you're using the very softest re -- results
2 from the softest water tests versus a -- a more
3 reasonable number that -- that should perhaps be
4 derived for the Nechalacho area given the significant
5 hardness of the water at that location.

6 So now we're going to con -- turn just
7 momentarily to nutrients and ions, and these are
8 specifically the latest set of requests that came from
9 the Board through other interested parties here at the
10 table where we looked at ammonia, other nutrients,
11 also threw in chloride and sulfate.

12 And here we have the backgrounds of
13 these kinds of concentrations of these -- these
14 parameters in the receiving environment, the model
15 numbers for both Drizzle and Thor Lake, and the
16 proposed SSWQs and how they might relate to a CCME
17 guideline.

18 And for ammonia, what we found was --
19 well, first of all, we found, and I'll show this in
20 the follow-up slide, is that the effect of ammonia on
21 toxicity is very dependent on pH and temperature.

22 And those are both at play, of course,
23 at Nechalacho. At the same time, ammonia and
24 background values in Drizzle Lake, for instance, can
25 be quite high -- is quite high in the winter period,

1 particularly again because of the actions of anoxia
2 under the ice and so on and so forth.

3 So we're basically saying, or
4 suggesting, that if we're going to have an SSWQ for
5 ammonia, it should be tied very much to whatever the
6 background condition is, and that will vary from time
7 to time throughout the year.

8 Chloride values, we don't see the
9 chloride coming anywhere near the CCME guideline
10 value. But for the moment, we're suggesting we stick
11 with the CCME guideline value because that is a very
12 precautionary number as well to protect aquatic life.

13 And given the hardness of this -- of --
14 of the water in this area, we don't ever see or
15 anticipate chloride becoming a problem. Nitrates,
16 both nitrate and nitrite, you'll notice there are a
17 couple that we didn't actually have in our model.

18 They were modelled in a different way,
19 which was presented in the DAR. They were modelled
20 together essentially. But the ones that we did have a
21 look at you can again see that we anticipate that any
22 concentrations we might project in the water bodies
23 downstream of the TMF will be well below existing CCME
24 guideline values.

25 This one is very close to the line in

1 terms -- well, sorry, this is the background is very
2 close to the CCME values, and we just anticipate that
3 total phosphate can be targeted at the CCME value,
4 which is essentially background.

5 Sulfate, again, is not really a
6 significant issue in our view, certainly at
7 Nechalacho, and we don't see any issue with achieving
8 a CCME guideline value for sulfate, which is currently
9 pegged at about a hundred (100).

10 Now there are some explanatory notes to
11 some of this work that follows in the -- in the next
12 and final slide, and I'd just like to go through some
13 of that with you here.

14 First of all, I guess there's some
15 broad statements again about Avalon is -- is firmly
16 committed to meeting the CCME guideline values in the
17 receiving environment at -- at the point of discharge
18 of water from Drizzle Lake moving downstream beyond
19 that.

20 It's also noted that there are some
21 natural accedences of CCME that occur in the aquatic
22 system below the -- the TMF, in particular in Drizzle
23 and Murky Lakes leading to Thor, and they include
24 naturally elevated TSS, ammonia, phosphorous, zinc,
25 cadmium, fluorine, and -- and iron. And for these

1 parameters, we think any site specific water quality
2 objectives that may be developed should be tied very
3 closely to and take into account of the background
4 conditions.

5 Little blurb on some of these less than
6 numbers. I'll just go through the more important
7 ones, I guess. We already talked about this as well.
8 Just pointing out again the -- the water hardness up
9 there is -- is very high, and -- and some of these
10 values are based on -- were selected for the high
11 values in the CCME that are allowed for harder waters.

12 Finally, I just -- I want to just focus
13 on the range for ammonia and how ammonia is affected
14 by pH and temperature. You just see that the total
15 ammonia levels can vary from 6 degree -- from -- from
16 6 milligrams per litre at 0 temperature, pH of 7, to
17 1.26 if the temperature is around 20 at the same pH.
18 And similarly at other pHs, you see again cha --
19 significant changes in temp -- in relation to
20 temperature and pH. And so if there are going to be
21 site specific water quality objectives established for
22 ammonia, they should take into account this kind of
23 variability that is normal for this particular water
24 system.

25 I believe that is the last slide, and I

1 know there'll be lots of discussion, and we hope we
2 can answer the ques -- any questions you may have.

3 THE FACILITATOR MERCREDI: Thank you,
4 Rick. And with that...

5

6 (BRIEF PAUSE)

7

8 MR. RICHARD HOOS: Well, I just --

9 THE FACILITATOR MERCREDI: I think,
10 Rick, you have one (1) more slide.

11 MR. RICHARD HOOS: That's it. That is
12 the next slide. Oh, you actually want me to talk
13 about this as well? Okay. Sorry.

14 Okay, so I'll just back up and say in
15 general, in terms of water quality, what we're doing
16 to ensure that water quality is protected for this
17 region and for the project area, these are the kinds
18 of mitigation measures that we've identified before in
19 the Developer's Assessment Report and, of course,
20 Avalon continues to be very committed to employing
21 these kinds of mitigation measures to ensure that all
22 will be well in terms of downstream water quality.
23 It's pretty straightforward.

24 I guess the most important one here
25 probably is that we -- Avalon is committed to ensuring

1 that the tailings effluent, which will be an
2 exceptionally clean effluent, will comply with any
3 criteria that might be put on it by the Mackenzie
4 Valley Land and Water Board. As well, of course, as
5 meeting the Metal Mining Effluent Regulations which
6 are federal ones. That's the bottom line on -- on
7 water that's going to go downstream into the system.

8 Beyond that, in terms of its domestic
9 sewage, it'll be using state-of-the-art packaged
10 treatment plants at both sites to ensure that the
11 water that will then be subsequently discharged to the
12 tailings facilities will be exceptionally clean.

13 Water consumption. Through the
14 feasibility work that is currently going on, there
15 have been continued efforts to reduce the amount of
16 water that will be used by the project, and certainly
17 in terms of withdrawing water from Thor Lake, as an
18 example, that will certainly be done in compliance or
19 in conformance with -- with DFO's guidelines for
20 winter water withdrawal and -- and the like.

21 And in terms of any hazardous
22 materials, Avalon, of course, has a waste management
23 plan and a hazardous waste management plan covering
24 the management of those materials, the storage of
25 them, the transportation, and eventual disposal of

1 them.

2 So basically those are the key
3 parameters there. Do you want me to talk about fish
4 and fish habitat too now? Okay, fine.

5

6 (BRIEF PAUSE)

7

8 MR. RICHARD HOOS: No. Okay. Thank
9 you. Sorry.

10 THE FACILITATOR MERCREDI: Thank you,
11 Rick.

12 MR. RICHARD HOOS: All right.

13

14 QUESTION PERIOD:

15 THE FACILITATOR MERCREDI: And --

16 MR. RICHARD HOOS: Sorry for the
17 confusion.

18 THE FACILITATOR MERCREDI: -- with
19 that, we will turn the mic over to the floor, open up
20 the floor for questions

21 Anne...?

22 MS. ANNE WILSON: It's Anne Wilson
23 with Environment Canada. I have a few questions, and
24 they're a little bit on the level of detail. So I'll
25 start -- could you put the slides back up with the

1 table for the nutrients on it? Great, thanks.

2 The guideline that's put up there for
3 nitrate as N shows twenty-nine (29). The CCME
4 guideline is two point nine three (2.93). Was that
5 just a transcription error -- transcription error, or
6 is that the proposed guideline?

7 MR. RICHARD HOOS: That -- okay, so --
8 sorry, there's a whole bunch of things here. First of
9 all, Rick Hoos, Avalon. You'll note that those are
10 milligrams per litre values. Is that, maybe, the
11 issue?

12 MS. ANNE WILSON: It's Anne Wilson.
13 No, the CCME guideline would be 2.93 milligrams per
14 litre if it's as nitrogen, as shown on the parameter
15 chart there.

16 MR. RICHARD HOOS: Okay. Well, I
17 haven't got -- got that information directly in front
18 of me here, but we can check on that, and if it is as
19 you say, then we'll certainly change that.

20 THE FACILITATOR MERCREDI: Could I
21 clarif -- can we clarify exactly what it will be
22 changed to?

23 MR. DAVID SWISHER: I think what we
24 indicate is we'll -- we'll -- we'll do our homework
25 tonight, and we'll get back to you first thing in the

1 morning.

2 THE FACILITATOR MERCREDI: Okay, since
3 it is homework, we will capture the wording. And --
4 and if you could please restate the question on that?

5 MS. ANNE WILSON: Thanks. It's Anne
6 Wilson with Environment Canada. The question is will
7 the proposed site specific water quality objective for
8 nitrate as nitrogen be the actual CCME value of two
9 point nine three (2.93) or the value of twenty-nine
10 (29) shown on the chart?

11 THE FACILITATOR MERCREDI: And Avalon
12 will clarify that, just for Simon's purposes so we
13 have the -- the wording correct.

14 MR. DAVID SWISHER: David Swisher,
15 here. Yes, we will clarify that for tomorrow morning.

16 THE FACILITATOR MERCREDI: Thank you.
17 And just to -- before we move on, we'll just make sure
18 Simon has that.

19 MR. SIMON TOOGOOD: Simon Toogood with
20 the Review Board. The question I have are -- are the
21 values in the site specific water quality objectives
22 table for nitrate as nitrogen -- are they to be the
23 CCME values of two point nine three (2.93) or the
24 values provided in the proposed site specific water
25 quality objectives chart. And I'll word that a bit

1 better.

2 THE FACILITATOR MERCREDI: Okay, and I
3 see Anne nodding that that captured it, and we will
4 move on. David is also nodding. Any further
5 questions?

6 MS. ANNE WILSON: It's Anne Wilson.
7 With respect to those parameters that you propose to
8 use background for the site specific water quality
9 objective, how would you propose to work that? Use
10 the -- the median of the range of natural variability
11 that's been measured? Or would you propose to have it
12 on a sliding scale throughout the seasons? What's
13 your thoughts on that?

14 MR. RICHARD HOOS: Rick Hoos here.
15 That's a good question. I -- from having looked at
16 the iron values, which are very seasonally driven and
17 very significantly seasonally driven, it wouldn't seem
18 appropriate to try and average out these numbers
19 because you'll end up with an artificially high
20 background condition for most of the year. So I think
21 it should be tied to the seasonal variability.

22 We did our own evaluation of some of
23 these parameters, and we did note that in order to
24 better define the seasonal variability, it would be
25 helpful to collect additional data, water quality

1 data, to help define those seasonal variations a bit
2 more precisely. And, of course, we have this year to
3 do that.

4 MS. ANNE WILSON: Thanks for that,
5 Rick. It's Anne Wilson again with Environment Canada.
6 My next question is a little bit of a nit-picky one,
7 and it's to do with the total phosphate. Will you be
8 measuring total phosphorous, which is a -- a broader
9 parameter and will include some of the forms that may
10 not be bio-available as total phosphate is, but will
11 be potentially available to the cycle, especially
12 during that winter anoxia that you had mentioned?

13 MR. RICHARD HOOS: I'm just -- I'm
14 just reading some of the documentation that we've
15 generated in house. And one (1) of the things that
16 we said was at baseline measurements, phosphorous in
17 the Thor Lake area to date have been reported for both
18 orthophosphate and total phosphate, but not as total
19 phosphorous.

20 I guess we might ask you what your
21 preference is.

22 THE FACILITATOR MERCREDI: And that
23 was Rick Hoos, for the record. Go ahead, Anne.

24 MS. ANNE WILSON: Thanks. Anne
25 Wilson. If there is going to be further work done in

1 the next year prior to development, it would be good
2 to get the total phosphorous measurements. That is
3 what is recommended in the CCME framework document
4 because it is the worst case scenario of --

5 MR. RICHARD HOOS: Yeah.

6 MS. ANNE WILSON: -- available
7 phosphorous.

8 MR. RICHARD HOOS: Yeah. Rick Hoos.
9 Thank you.

10 THE FACILITATOR MERCREDI: And thank
11 you.

12 MS. ANNE WILSON: Sorry, it's Anne
13 Wilson. One (1) last question that does not relate to
14 the values presented, but have you refined or updated
15 predictions for total dissolved solids in Drizzle
16 Lake?

17 MR. RICHARD HOOS: Rick Hoos. No, we
18 haven't been focussing on TSS, I guess primarily
19 because we felt the other parameters were of much
20 greater interest to -- to all here. But we could
21 certainly go back and -- and look at that more
22 carefully as well, if you wish.

23 MS. ANNE WILSON: Anne Wilson. And
24 just to clarify, that's total dissolved solids, not
25 TSS, okay?

1 MR. RICHARD HOOS: Oh, total dissolved
2 solids.

3 MS. ANNE WILSON: Yeah

4 MR. RICHARD HOOS: Yeah, TDS. Okay,
5 sorry.

6 MS. ANNE WILSON: Sorry, it's Anne
7 Wilson. I would be happy to have that as an
8 undertaking. Thanks.

9 THE FACILITATOR MERCREDI: And on
10 that, is this something that Avalon can produce within
11 a week, or is this something that might take a couple
12 weeks? Just if -- if this is to be, like, within
13 earshot of the parties, then we would have to. If
14 it's -- if it's --

15 MR. RICHARD HOOS: Yeah.

16 THE FACILITATOR MERCREDI: Definitely
17 if it's internal, that's fine. But if -- if it is --
18 okay, for sure.

19 MR. DAVID SWISHER: Yeah, so we're
20 going to commit to try to get answers before the
21 hearing sessions close this week. And we'll have a
22 response on if we need more time after that.

23 THE FACILITATOR MERCREDI: Very well.
24 So we'll -- we'll take that as homework number 3. And
25 again, if it is not -- if it is not answered within

1 the technical session, then it will become an
2 undertaking. So with that, we will capture the
3 wording. And, Simon, if you could read out what you
4 have, and we'll see if that capture -- yeah.

5 MR. SIMON TOOGOOD: It's Simon with
6 the Review Board. I may have missed the first part,
7 but from my understanding, it's Avalon to provide a
8 total dissolved solid values for Drizzle Lake.

9 THE FACILITATOR MERCREDI: And for the
10 record, I see Anne nodding. And again, that will be
11 homework number 3. And again, if -- if any -- any of
12 this might turn into undertakings, obviously that --
13 that will become evident.

14 With that, I'll turn the floor to Anne
15 and Nathan.

16 MR. NATHAN RICHEA: Hi there. It's
17 Nathan Richea with the Water Resources Division of
18 Aboriginal Affairs. I guess I've just been doing some
19 thinking over the last little bit here. I'm just
20 trying to wrap my head around the tables.

21 I think Rick mentioned that they noted
22 a bit of a glitch, I guess, in the modelling for
23 downstream water quality. And I was just wondering if
24 I could get maybe a homework item or an undertaking on
25 what has changed in the modelling for some of those

1 numbers to go up.

2 I was trying to do a quick comparison
3 from the tables I had in front of me with what was up
4 on the screen. And I noticed for some parameters it
5 changed a bit more than other parameters. So I was
6 just trying to understand when you model and try to do
7 predictions for downstream water quality, you need to
8 take into account a number of assumptions.

9 And if -- if there's been some changes
10 to that, I'd like to sort of understand those a bit
11 more because it helps frame the context of -- of where
12 you might focus your review. So I see the new
13 numbers, and that's great, but I kind of want some of
14 the background as to what's changed and how those
15 numbers -- what -- what's driven the change in those
16 numbers as a context.

17 So I'm just thinking of maybe a
18 homework type thing or an undertaking so I can get a
19 bit of an understanding of that.

20 THE FACILITATOR MERCREDI: Okay, so
21 Avalon will be providing the presentation that Mr.
22 Bubar and that Rick and David gave that captures most
23 of the numbers from this morning as well as the
24 homework items.

25 And so are you asking for something

1 different than the -- the presentation? Because that
2 is --

3 MR. NATHAN RICHEA: Yeah.

4 THE FACILITATOR MERCREDI: --
5 something we will capture for the public registry.

6 MR. DAVID SWISHER: Yes. And -- and I
7 think maybe to -- to save homework and undertaking, we
8 can answer that. David Swisher, Avalon. We can
9 answer that right now for you, Nathan. That's why we
10 have Jim with us who did the modelling. So he has
11 more of the background and details for you.

12 So, Jim, would you mind answering
13 Nathan?

14 MR. JIM STRONACH: Jim Stronach. The
15 -- I think the fundamental change was we discovered we
16 hadn't properly implemented the recycling. The way we
17 handle the -- the modelling is that the tailings goes
18 out of the plant into the tailings pond and then into
19 Drizzle and Murky and on to Thor Lake, so Thor Lake
20 receives diluted tailings.

21 And then the way we implemented the
22 plant operations is we said that the plant would draw
23 its make-up water from Drizzle Lake, and then the
24 concentration coming out of the plant would be equal
25 to the concentration in Thor Lake plus the five (5)

1 day decant value. And I think that's probably the
2 most conservative thing you could do is -- you know,
3 there may be other chemistry acting that makes that,
4 I'm not quite ha -- what happens.

5 So that was the intent, but it was
6 implemented incorrectly in -- in the earlier
7 calculations, which led to apparently higher dilutions
8 than were correct. And now we did a independent
9 calculation outside of our standard model; identified
10 that there was a problem with the dilutions and looked
11 at the Code and saw that we had this coding error for
12 the recycling of water back into the plant. That's
13 the fundamental reason.

14 The other reason you'll note
15 differences in changes is because for some
16 constituents, the background concentration is a major
17 factor. The plant discharge is a lower concentration
18 than the -- than the background in some cases. So in
19 those cases, the sort of effect of dilution is masked
20 or overwhelmed to some extent by the background, so
21 you won't see the same level of change between the old
22 numbers and the new numbers.

23 So I think those are the two (2) -- I
24 think those answer your questions, I hope.

25 THE FACILITATOR MERCREDI: And Nath...

1 (BRIEF PAUSE)

2

3 THE FACILITATOR MERCREDI: Nathan...?

4 MR. NATHAN RICHA: Thank you. It's

5 Nathan Richea with the Water Resources Division. I

6 think I'm confused on the very first part of the

7 answer. I think you were mentioning something about

8 Thor Lake versus Drizzle Lake, and I got confused on

9 whether maybe the -- the lakes were supposed to be

10 interchanged.

11 Thor Lake is the lake that's further

12 along in the receiving environment. Drizzle Lake is

13 the immediate discharge body from the tailings area.

14 And I think at the start there maybe perhaps the --

15 the lakes got interchanged, so I got confused and --

16 can you clarify? Thanks.

17 MR. DAVID SWISHER: David Swisher

18 here. Yeah, you -- you are correct. I -- I think --

19 yeah, you said Drizzle, and it should have been Thor.

20 MR. NATHAN RICHA: Yeah, okay,

21 thanks. It's -- it's Nathan. I -- I don't know why,

22 I guess I just have -- it's Nathan Richea with the

23 Water Resources Division. It's just one (1) of those

24 things where I -- I'm not sure if I could follow the

25 first answer again now because I kind of got thrown

1 off by the names of the lakes. And I guess rather
2 than going to the transcripts, it would be great if we
3 could have this stuff kind of written down, like the
4 tables that were provided today are -- is new
5 information; we hadn't seen it previously. So I still
6 think it might be a nice homework item to sort of lay
7 out what has cha -- what has changed. Like, we can
8 still talk about it today. That's -- that's great,
9 but just so I can understand it. Sometimes it takes a
10 while for me, maybe I'm slow processing, just to get
11 it through my head.

12 THE FACILITATOR MERCREDI: That's
13 reasonable. So, Simon, I'm going to turn to you for
14 wording. Do you have that captured?

15 MR. SIMON TOOGOOD: It's Simon
16 Toogood. Not particularly well, no. From what I
17 gather, it's -- you're asking a question on what has
18 changed in Avalon's modelling for certain parameters
19 in downstream water modelling? And specifically, what
20 parameters were you interested in?

21 MR. NATHAN RICHEA: Yeah, it's Nathan
22 Richea with the Water Resources Division. Yeah, I
23 guess the -- the crux of the question, I guess at the
24 start, was just trying to understand what assumptions
25 were put into the model or which changed. I think

1 they mentioned there was a glitch in the model;
2 they've rectified that. That's great. I just wanted
3 to know a bit about what has changed, and we can talk
4 about it again further today. But written down which
5 change from the previous model, how that's changed
6 certain parameters versus other parameters.

7 I don't have any specific parameters in
8 mind just because I -- this is the first time I've
9 seen the different numbers, so I don't know exactly
10 which ones to focus in on. But yeah, generally the
11 question is they've noticed a glitch in the model,
12 they can identify what the glitch is, they can tell us
13 what they've done to change that and how the new
14 numbers have resulted. It might be a page, I don't
15 know.

16 MR. DAVID SWISHER: David Swisher here
17 with Avalon. Yeah, we'll do that homework, and we
18 should be able to produce that for tomorrow.

19 THE FACILITATOR MERCREDI: Sounds
20 good. Hopefully Simon has captured that before me
21 move on.

22

23 (BRIEF PAUSE)

24

25 MR. SIMON TOOGOOD: It's pretty

1 similar to the first reading, but what assumptions
2 were made and what has changed in Avalon's modelling
3 for certain parameters in the -- just to clarify, I
4 suppose that's for Thor Lake, downstream Thor Lake?

5

6 (BRIEF PAUSE)

7

8 MR. SIMON TOOGOOD: Drizzle and Thor.
9 Downstream water modelling for Drizzle and Thor Lakes.

10 THE FACILITATOR MERCREDI: Okay. I
11 see Nathan nodding. With that we'll move on, and
12 Avalon -- Avalon has already commented on that, so
13 with that we'll move on.

14 MR. NATHAN RICHEA: Thank you. It's
15 Nathan Richea with the Water Resources Division
16 Aboriginal Affairs. The five (5) day decant numbers
17 that are presented are -- I think they've been the
18 standard numbers throughout, and I just wanted to
19 confirm that that's still the case.

20 Like, they are the same numbers that
21 were presented probably in a DAR and in -- in
22 Information Request responses that we've received over
23 the course of the process?

24 MR. DAVID SWISHER: Yes, they were.
25 And -- and -- David Swisher, Avalon. Yes, they were,

1 Nathan, and -- and also just as Rick mentioned in his
2 presentation, we chose that because they're very
3 conservative.

4 We know, and of course I think in our
5 commitments we've already said we're going to have a
6 thirty (30) day decant period.

7 MR. NATHAN RICHEA: Thank you. It's
8 Nathan Richea with the Water Resources Division.
9 Yeah, that's a good answer because it leads me to the
10 second question. So in the thirty (30) day retention
11 time, it's still going to be in place even with the
12 removal of the additional polishing pond under the new
13 designs for the tailings containment area?

14 MR. DAVID SWISHER: David Swisher,
15 Avalon. Yes. In fact, the polishing pond is
16 incorporated into the new tailings facility. And one
17 (1) other note, and hopefully Jim and -- and Rick
18 don't strangle me here, but on the modelling, the
19 modelling assumed a continuous flow, which was also
20 very conservative because we know we're going to be
21 doing the thirty (30) day decant at a minimum, and
22 we're also going to be coinciding any of those
23 discharged with -- as we've discussed with KP and
24 others, with high flow seasonality changes.

25 MR. NATHAN RICHEA: Okay. Thank you.

1 It's Nathan Richea with the Water Resources Division.
2 So if I understand correctly then, the discharge will
3 be, like, a monthly type discharge, a decant every
4 thirty (30) days?

5 Is that what -- instead of a continuous
6 discharge, or will it still be continuous but you've
7 assumed the thirty (30) day -- I'm just trying to get
8 clarification.

9 MR. RICHARD HOOS: Rick Hoos here.
10 Our understanding remains the same. The -- the
11 effluent will stay within the tailings management
12 facility for at least thirty (30) days, and -- and
13 there will be discharges from the TMF downstream on a
14 seasonal basis, somewhat tied -- well, tied to -- to
15 the natural hydrological cycle that prevails in the
16 area, and that's to protect fisheries values as well
17 related to hydrology interests.

18 THE FACILITATOR MERCREDI: Okay.
19 Before we get too far in, Ralph had a question on one
20 (1) of the -- about two (2) topics ago, I think, so
21 we'll have him weigh in.

22 MR. RALPH GRISMALA: Ralph Grismala,
23 ICF Marbek. I have a question about the tracer
24 concentration studies that were done. In the original
25 DAR, there were certain concentrations reported, and

1 it showed the plant discharge with a value of one
2 point 0 (1.0), and I think after twenty (20) years,
3 Thor Lake got down to about .0007 milligrams per
4 litre.

5 In the response to one (1) of the
6 Information Requests, I believe in December 2011,
7 Avalon recognized that there was an error in the
8 original tables in the DAR because they had used a
9 value of one point 0 (1.0) in the tables instead of
10 the zinc concentration of point zero zero seven
11 (.007), which is what the model was actually based on.

12 The difference in those ratios between
13 the one (1) and the point zero zero zero seven (.0007)
14 and the point zero zero seven (.007) and the point
15 zero zero zero seven (.0007) is the difference between
16 the dilution ratio of about, I think it was, fourteen
17 hundred (1,400) to one (1) versus ten (10) to one (1).

18 When Avalon responded to the
19 clarification letter in May, they seemed not to
20 recognize the correction they made in December, and
21 they went back to the procedure that was in the
22 original DAR. If I do a simple water balance of the
23 water available in the tailings pond, you know,
24 reasonable values for precipitation, the flow from the
25 plant, I don't see how you possibly get the dilution

1 ratios that the original DAR tables imply.

2 And I was wondering if I could get some
3 clarification on that.

4 MR. JIM STRONACH: Jim Stronach here.
5 You're absolutely correct. The -- the dilutions we
6 had were -- were too high because of that glitch,
7 having to do, as I said, with the recycling. And --
8 and we did our wa -- an independent little water
9 balance a week or two (2) ago just in preparation for
10 this meeting and said, Yeah, just looking at it in
11 bulk terms, like inflow from overland flow and
12 precipitation, you only get these considerably lower
13 dilutions. So then we looked again at the code and
14 said, Yeah, that glitch is still there. So then we
15 redid everything so that we had for the -- the new
16 values. So we -- we made a mistake in -- and got a
17 little bit confused about when we'd made that mistake.
18

19 But the -- the numbers now match a very
20 simple water balance. And we've checked it in the
21 code that everything flows through properly, so. I --
22 I think there was an error, but the problem is solved
23 or resolved.

24 MR. RALPH GRISMALA: Ralph Grismala.

25 THE FACILITATOR MERCREDI: Could you

1 just turn off your mic? Yeah, perfect.

2 MR. RALPH GRISMALA: Ralph Grismala,
3 ICF Marbek. Comparing the numbers that were in the
4 DAR to the table that was in, I think, the May 11th
5 response to the clarification letter, is that the most
6 recent calculation that includes the correction of the
7 code, or is there a subsequent correction beyond that?
8 I -- I'm sorry, the, I guess, May 12th response to the
9 clarification letter.

10 Is that the latest?

11 MR. JIM STRONACH: No, I think the
12 latest is the one that we see in the PowerPoint
13 presentation today. That was Jim Stronach.

14 MR. RALPH GRISMALA: Ralph Grismala.
15 Do those numbers differ dramatically from the ones
16 that were in the May 12th response on the order of a
17 factor of, you know, call it several orders of
18 magnitude, or were they the minor errors having to do
19 with the recycling of the -- of the values to the
20 lakes be -- because that was a relatively small effect
21 compared to the original error?

22 MR. JIM STRONACH: I -- Jim Stronach
23 here. I don't have the May numbers in front of me.
24 The -- the new numbers are very similar to what was --
25 after we made our first correction except that we've

1 now added the -- the background concentrations in.

2 MR. RALPH GRISMALA: Ralph Grismala,
3 ICF Marbek. Perhaps we should have a homework
4 assignment that they could present the simple -- you
5 said you do the hand calculation or something outside
6 the model calculation, so we can see in -- in rough
7 numbers the approximate values of those dilution
8 ratios, so it would give us some higher degree of
9 comfort that the computer runs are correct, or the
10 spreadsheets runs, whatever they are.

11 MR. JIM STRONACH: Jim Stronach here.
12 I'm not sure I can produce them in the homework time
13 frame, because they're in -- in hard copy in my
14 office. But I can do it. Homework is -- well, within
15 a week I can do it.

16 THE FACILITATOR MERCREDI: And we can
17 do that as an undertaking should Avalon -- so August
18 31st.

19 MR. DAVID SWISHER: Da -- David
20 Swisher here. We'd rather have it be a homework for
21 this week. And we will endeavour to have that to you
22 this week. And if we can't, then we'll -- we'll move
23 it as an undertaking.

24 THE FACILITATOR MERCREDI: Very well.
25 And so before lunch we will capture that and turn to

1 Simon Toogood for wording. And then we will -- we'll
2 break for lunch so we can beat the lunch crowd.
3 Simon?

4 MR. SIMON TOOGOOD: I'll -- I'll take
5 about an hour to do this then. So just to clarify, to
6 present the simple calculation of the approximate
7 values of dilution ratios for -- what was the topic of
8 discussion here?

9 MR. RALPH GRISMALA: Ralph Grismala.
10 It has to do with the dilution ratios that -- or, the
11 outcome of the tracers modelling studies.

12 MR. SIMON TOOGOOD: So would it be
13 fair to say: Present a simple calculation of the
14 approximate values of dilution ratios for tracer
15 modelling studies?

16 MR. RALPH GRISMALA: Ralph Grismala.
17 I believe it would.

18 MR. SIMON TOOGOOD: Okay. Thank you
19 very much.

20 THE FACILITATOR MERCREDI: Thank you,
21 Simon. And so with that, before we break for lunch,
22 with the tables that Avalon is producing if they could
23 produce that for all parties. So I would venture to
24 say twenty (20) -- sorry, thirty (30) copies, just for
25 those present.

1 MR. DAVID SWISHER: David Swisher.

2 You want hard copies or soft copies? Because --

3 THE FACILITATOR MERCREDI: From what I

4 understand, for the tables from the discussion about

5 twenty (20) minutes ago that Avalon was to produce

6 over lunch, which I believe were just hard copies, of,

7 I think, two (2) slides off of the -- off of the

8 presentation. If -- if -- if that could be about

9 thirty (30) copies, just so that those in the room

10 have that. Just in fairness it is for everyone in the

11 room.

12 MR. DAVID SWISHER: Okay.

13 THE FACILITATOR MERCREDI: And I see

14 David nodding for that. With that, we'll break for

15 lunch and I encourage everybody to meet the lunch

16 crowd to the restaurants. So, with that, we'll

17 reconvene at one o'clock.

18

19 --- Upon recessing

20 --- Upon resuming

21

22 THE FACILITATOR MERCREDI: Okay, so,

23 we'll get underway here. Welcome back from lunch.

24 Just a couple of reminders. There's a -- there are

25 agenda at the front table and a sign-in sheet in case

1 nobody is signed in. So signing in is an important
2 part of -- of maintaining transcripts.

3 And if there -- just a reminder -- if
4 there were offline discussions that might have
5 resolved issues during lunch or any break, any parties
6 please speak up on the record so that, you know,
7 that's an issue that fell off the table, as it were,
8 and the Review Board does not have to -- or just,
9 well, could take note that it has been resolved and
10 move on to larger issues.

11 So, thank you to Avalon for providing
12 the tables for the parties and just in case anybody --
13 so the parties are aware, the tables that we mentioned
14 before breaking for lunch are back in a pile, I
15 believe, at the front table. And, again, thank you
16 for -- thank you, Avalon, for presenting that.

17 With that -- and is there anybody on
18 the teleconference, please speak up now. And let the
19 record show no, so, with that, we will continue on
20 with the water quality discussion.

21 Did -- over lunch, did Avalon have
22 anything they wanted to bring up?

23 MR. DAVID SWISHER: David Swisher,
24 Avalon. No, I think -- I -- I'm assuming at the end
25 of the day then, we will review all the homework

1 items.

2 THE FACILITATOR MERCREDI: Yes, we
3 will. And among those we'll make it a quick homework
4 number 4 because Avalon has already committed to doing
5 it -- the presentation -- forwarding that to my email,
6 if that's possible. And I will endeavour to post that
7 immediately, which we will not make homework. Okay,
8 so, homework number 4, the presentation forwarded to
9 me.

10 And, with that, we'll turn the mic
11 over. I believe we left with Ralph and his questions.
12 We left off with the homework regarding the
13 calculations.

14 Ralph, do you have any follow-up to
15 that?

16 MR. RALPH GRISMALA: Ralph Grismala,
17 ICF Marbek. Just a -- a -- a quick question. I was
18 looking at the table that was presented over lunch and
19 I believe in the original DAR, because everything was
20 modelled on the tracer concentrations, the ratio
21 between the five (5) day decant and the concentrations
22 in, you know, whatever water body downstream was the
23 same ratio regardless of the element. These are
24 slightly different depending on the elements and it
25 appears that's because of the background

1 concentrations.

2 My question is on, in particular, the
3 rare earth elements where the backgrounds means are
4 very low, did you include some non-zero value for
5 those, because those ratios also seem to vary. So,
6 would you please clarify?

7 MR. JIM STRONACH: I -- I'm quite
8 certain that whenever the number was -- sorry, Jim
9 Stronach speaking. When -- whenever the concentration
10 was less than the detection limit, we use one half
11 (1/2) of the detection limit for the calculations.

12 MR. RALPH GRISMALA: Ralph Grismala.
13 Thank you.

14 THE FACILITATOR MERCREDI: Thank you.
15 And thank you, Ralph. Nathan, I know we interjected
16 there during -- somewhere during your line of
17 questioning, so we'll go back to you.

18 MR. NATHAN RICHEA: Hi, it's Nathan
19 Richea with Water Resources Division, Aboriginal
20 Affairs. I think my question was regarding the
21 polishing pond retention time, if I can remember
22 correctly. And I think the answer back was that there
23 will be thirty (30) days available storage within the
24 pond. I guess the part where I was not quite clear
25 was whether there would be continuous discharge. And

1 I think -- can I just get confirmation that there will
2 be continuous discharge from...?

3 MR. RICHARD HOOS: It will be --
4 sorry, Rick Hoos. Our understanding is that Avalon
5 doesn't need to discharge continuously, but Avalon has
6 committed to discharge an appropriate amount of water
7 to match the -- the natural hydrological cycle of the
8 open water season. There will certainly not be any
9 discharge in the winter months.

10 MR. NATHAN RICHEA: Thank you. It's
11 Nathan Richea with the Water Resources Division. So I
12 can understand that -- are you proposing to do a
13 staged discharge based on the hydrograph, the natural
14 hydrograph, because overall there's a net reduction
15 in, I guess, the amount of water that's moving through
16 the system from Thor Lake, I guess, on?

17 MR. KEVIN HAWTON: Kevin Hawton with
18 Knight Piesold. Just discussing the thirty (30) day
19 retention time, we actually have more than that if we
20 -- if we need it. And, you know, I'm not -- I don't
21 really want to speak for Avalon, but we have the
22 ability to -- I mean, we're not going to discharge
23 water if the water quality isn't acceptable.

24 So we could, theoretically, hold water
25 longer than thirty (30) days, but we're going to try

1 and match the hydrologic cycle as much as possible.

2 Does that answer your question?

3 MR. NATHAN RICHEA: Thank you. It's

4 Nathan Richea with the Water Resources Division.

5 Yeah, I think the -- the answer is sufficient. I'm

6 just trying to understand how the thirty (30) day

7 retention may change with the difference in the

8 polishing pond.

9 I know originally it was -- the

10 tailings containment area had a polishing area within

11 it. And then over time, as the tailings accrued

12 within the containment area, an additional polishing

13 pond would be proposed. But that has been removed and

14 I think you have enough capacity to have the

15 additional, or the original pond, with sufficient

16 capacity to hold any sort of water that comes off the

17 tailings for the twenty (20) year period of the

18 operation. Is that correct?

19 MR. KEVIN HAWTON: Yeah, I mean --

20 Kevin Hawton here. Basically, as -- as the facility

21 progresses through its life, during the initial years

22 we've got capacity, obviously, to -- to hold water for

23 as long as we want it.

24 And -- and really, we get limited to

25 the thirty (30) days towards the -- about the

1 twentieth year, right? That's what it's designed for,
2 okay?

3 MR. NATHAN RICHEA: Thank you. It's
4 Nathan Richea with the Water Resources Division. That
5 thirty (30) days that we're talking about, is that
6 below the 1 metre freeboard type safety?

7 MR. KEVIN HAWTON: Yeah, that's the
8 difference between the normal operating level and the
9 maximum operating level. And above the maximum
10 operating level we have our environmental design storm
11 and freeboard, et cetera, okay?

12 THE FACILITATOR MERCREDI: And that
13 was Kevin Hawton, for the record.

14 MR. NATHAN RICHEA: Thank you. It's
15 Nathan Richea with the Water Resources Division. I
16 think originally, too, that the proposal was to have
17 water leave the facility through a -- a containment
18 ditch. But I think now you'll be pumping it via a
19 pipe? I just wanted to get confirmation if that's the
20 process to remove the water from the tailings.

21 MR. KEVIN HAWTON: Kevin Hawton, here.
22 Yeah, the -- the current thought is that it'll be a --
23 a barge and it'll pump through a pipe into a ditch, a
24 line ditch. But there -- there's no discharge in the
25 winter or anything like that, so. Okay?

1 MR. NATHAN RICHEA: Thank you. It's
2 Nathan Richea with the Water Resources Division. So
3 there'll be a barge floating within the tailings
4 containment area, pumping water, and it will be
5 discharged to a containment ditch that would release
6 to the Drizzle Lake?

7 MR. KEVIN HAWTON: Kevin Hawton, here.
8 Yeah, that's correct. It's within the polishing pond.

9 MR. NATHAN RICHEA: Thank you. It's
10 Nathan Richea, Aboriginal Affairs, Water Resources. I
11 think in response to one of our Information Requests
12 you mentioned, I think, and you also mentioned today,
13 during winter months, I think December through April,
14 you will not be discharging from the tailings
15 containment area. Can -- can you confirm that?

16 MR. KEVIN HAWTON: Yeah, I confirm
17 that. Kevin Hawton here.

18 MR. NATHAN RICHEA: Thank you. I've
19 got a couple of questions, I guess, now that I sort of
20 understand what's happening for a discharge from the
21 tailings containment area.

22 The mixing analysis that's being done
23 for Drizzle Lake, Murky Lake, and then Thor Lake,
24 we're talking whole lake averages, right. We're not
25 talking about concentrations that will immediately

1 report to those receiving bodies, is that correct?
2 Like in the table that we just got today, those are
3 whole lake average concentrations, not -- not
4 concentrations that would come out from the ditch?

5 MR. JIM STRONACH: Jim Stro -- Jim
6 Stronach here. They're actually concentrations
7 selected from the approximate centre of the water
8 body, and it's spatially resolved in horizontal and
9 vertical. But there's so much wind mixing, I guess
10 small amount of winds, that most of lakes were pretty
11 well homogeneous in -- in plan view in terms of the
12 concentration.

13 MR. NATHAN RICHA: Thank you. It's
14 Nathan Richea, with the Water Resources Division. So
15 is it safe to assume that it's assumed that the entire
16 lake is fully mixed in these concentrations that
17 you've prepared?

18 MR. JIM STRONACH: Very close to that,
19 yeah. I couldn't quote the exact structure and the
20 vertical of the -- of the contaminants. They tended
21 to be a little bit higher in the surface but not pro -
22 - probably not more than 1 percent difference top to
23 bottom.

24 THE FACILITATOR MERCREDI: And that
25 was Jim Stronach.

1 MR. RICHARD HOOS: Na -- Nathan, if I
2 may. Sorry, Rick Hoos here. I just also wanted to
3 mention I think, as you know, the both Di -- Drizzle
4 Lake and Murky are very shallow water lakes. We're
5 talking max depth of about 2 metres. So they're very
6 shallow water bodies.

7 And, in fact, we -- although we've
8 never really mentioned it, they -- they are de facto
9 biotreatment facilities because they happen to be very
10 marshy lakes, and they themselves will help to, let's
11 say, assimilate, in particular, nutrients, as an
12 example, but perhaps some other parameters as well.
13 They -- they will contribute to further reductions in
14 -- in some of these parameters that have been modelled
15 based strictly on dilu -- dilution at this point.

16 MR. NATHAN RICHEA: Thank you. It's
17 Nathan Richea, with the Water Resources Divisions. So
18 the mixing analysis, you haven't done a mixing analys
19 -- analysis of how the effluent, once released to
20 Drizzle Lake, will behave within the lake proper.
21 You've just done sort of a mass balance mixing
22 analysis for a total average concentration, assuming a
23 full mixing of the tire -- the entire lake itself?

24 MR. JIM STRONACH: It's Jim Stronach
25 here. No, as I said, we used a three-dimensional

1 numerical model, which means we had a certain number
2 of grid cells in the east, west, and north, south
3 direction. So each lake was fairly well resolved
4 spatially.

5 So if there were differences, and there
6 are slight ones you can see when the flow enters from
7 the preceding lake along a channel at the -- sort of
8 the mouth of this creek, you'll see a slight
9 concentration difference. But basically the lakes
10 become quickly mixed in the horizontal just because of
11 the -- the winds which are not strong, but they're
12 pretty persistent there.

13 MR. NATHAN RICHEA: Thank you. It's
14 Nathan Richea, with the Water Resources Division.
15 Yeah, I guess I was just trying to understand.
16 Because I'm looking at the table here and I'm -- I'm
17 looking at the maximum model twenty (20) year value.
18 And I see some of the -- the maximum numbers are less
19 than the background condition for a few of the
20 parameters.

21 I'm just trying to understand how, you
22 know, basically that could happen. If -- if we're
23 assuming entirely mixed receiving body, then the
24 concentrations entering that receiving body must be a
25 lot lower, substantially lower than the baseline

1 condition in order to improve the quality in that
2 receiving basin over time, say in twenty (20) years.
3 So I just wanted to get confirmation for a few
4 parameters. That seems to be the case. Is that -- is
5 that true?

6 MR. JIM STRONACH: Yeah, Jim Stronach
7 here. Yeah, that's true. The one (1) that comes to
8 mind is iron, which in -- in one (1) of the lakes is
9 five (5) or six (6) times higher than even the
10 effluent leaving the -- the plant. So in those cases,
11 the plant effluent dilutes the concentration in the --
12 in -- in the water body under discussion.

13 MR. NATHAN RICHA: Thank you. It's
14 Nathan Richea, with the Water Resources Division. I'm
15 looking at the -- the table that was submitted
16 previously. And -- and I guess I was thinking that
17 potentially we've had some discussions about site-
18 specific water quality objectives and I was looking at
19 the table and -- and I was thinking that for a number
20 of the parameters the potentials was for the whole
21 lake average to be within the background concentration
22 for the entire duration of the project.

23 I know that those predictions have been
24 revised now, so maybe the comment is not quite as
25 relevant but -- I'd have to do some further

1 assessments -- but I'd -- be interesting to hear what
2 your perspective would be on is it possible for the
3 site-specific water quality objectives to be within
4 the natural range, say a ninety (90) or ninety-fifth
5 (95th) percentile of background at the outlet of
6 Drizzle Lake. I'm just interested to hear what you
7 might have for perspective on -- on that.

8 MR. RICHARD HOOS: Yes, Rick Hoos
9 here. I know we had a little bit of discussion on
10 this beforehand, but I -- I believe it's -- it's
11 Avalon's going-in position at this time.

12 Certainly, our recommendation that
13 conformance with the CCME guideline values offer, in
14 themselves, a very significant degree of protection to
15 the aquatic system, particularly since all of the CCM
16 guideline values themselves are based on a very
17 precautionary approach. And at no time have we
18 actually factored in the -- the beneficial influences
19 of harder water and higher pH water which are
20 characteristic of this system.

21 So, at this point in time, it would --
22 it seems reasonable for Avalon and -- and ourselves as
23 their consultants to advise them that con --
24 conformance with CCME guidelines is -- is very
25 appropriate at this time. And we don't particularly

1 want to commit to achieving levels that are well below
2 CCME even though we do recognize that many of the
3 effluent parameters are already below.

4 I think we should all be grateful that
5 at the end of the day the effluent quality will be
6 better for many parameters than background or CCME in
7 particular and -- and let the monitoring -- the
8 environmental monitoring -- which will be very
9 comprehensive, as you know, both EM monitoring AMP
10 monitoring perhaps will help to demonstrate whether
11 there's any residual issue of any kind associated with
12 this form of discharge and operation.

13 So, I guess we're reluctant to start
14 committing to numbers that are well below CCME even
15 though it is apparent to anyone looking at this table
16 that the going-out effluent will, in fact, be below
17 CCME for most of the parameters even before it leaves
18 the tailings pond -- tailings management facility.

19 MR. NATHAN RICHEA: Thank you. It's
20 Nathan Richea with the Water Resources Division of
21 Aboriginal Affairs.

22 Recently, the Land and Water Board
23 released water and effluent quality management policy.
24 It talks about source control and best management
25 practices for reducing contaminants from re -- getting

1 released into the receiving environment.

2 So I guess sort of the premise for the
3 question that I'm bringing up is if -- if we can meet
4 a standard that's better than, you know, a national
5 standard that, you know, may not be site-specific, and
6 it's reasonably and practicably achievable, if we
7 could actually set an objective that enhances the
8 protection for the downstream receiving environment.

9 And I was just going to try to get an
10 understanding of if we could meet a parameter at the
11 end of initial receiving body, the first lake for
12 example, and we can be within a natural background
13 range, it would be, you know, best practice to sort of
14 adopt that if it gives the company, sort of, the
15 flexibility to still have some operational flexibility
16 to a -- to achieve it.

17 But if -- if, upon those assessments,
18 we could come to a reasonable conclusion that we are
19 within the background range, would that not be an
20 appropriate objective to set for the project?

21 So, obviously, we might have to have
22 some further discussions on that, but I also wanted to
23 draw some attention to the fact that the CCME water
24 quality guidelines are basically driven by toxicity
25 alone. To come up with the guidelines they've done

1 some assessments of acute and chronic toxicity and
2 then set a safety factor to set an appropriate limit
3 that would hopefully be protective of all conditions.

4 However, for some of those parameters
5 in -- in this case, some of them may be contaminants
6 of potential concern. There's an opportunity for that
7 parameter to biomagnify in the receiving environment.
8 An example would be like mercury or cadmium, or
9 selenium. So defaulting to a CCME water quality
10 guideline alone takes into account the toxicity of
11 that parameter on the receiving environment, but it
12 doesn't attt -- account for the biomagnifica --
13 biomagnification potential of that parameter on the
14 receiving environment.

15 So a good rule of thumb is to, you
16 know, look at what CCME compares to your effluent, but
17 it's not the only way to look at setting objectives
18 for your receiving environment. And we need to
19 understand how your effluent will behave in the
20 receiving environment and to ensure that we're
21 protecting downstream water and uses, whether it be
22 fish -- fish or aquatic organisms.

23 So I think there's more discussion to
24 be had on if -- if we could meet something. And we
25 have the flexibility, you know, whether it's a whole

1 lake average or whatever it happens to be, under a
2 worst-case scenario, that the site-specific water
3 quality objective be set at a -- a more protective
4 standard.

5 I also noted, I guess I was looking
6 through some of the ba -- the baseline or background
7 condition, and, for mercury, it doesn't seem like we
8 have a full handle on what the potential concentration
9 is. It seems to be less than detection limit, but the
10 detection limits are not, like, an ultra low
11 detection.

12 And there is some concern about mercury
13 concentrations in fish tissue currently in the region.
14 And the slightest increase in mercury concentrations
15 that could contribute to that biomagnification is a
16 concern.

17 So I was wondering if it was possible
18 during the summer season to have some samples be
19 collected and sent for some ultra low detections to
20 try to get a handle on what the actual natural
21 background concentrations are, for example, for
22 mercury. Because it is an area of concern for aquatic
23 organisms and -- and fish in particular.

24 MR. DAVID SWISHER: Well, that was a
25 mouthful, Nathan. I guess what I -- maybe a quick

1 clarification. I -- I didn't quite understand what
2 you were talking about with regards to CCME and more
3 protective measures. Are you saying that CCME is not
4 protective enough?

5 THE FACILITATOR MERCREDI: And that
6 was David Swisher with Avalon.

7 MR. NATHAN RICHEA: Thank you. It's
8 Nathan Richea with the Water Resources Division.
9 Yeah, I guess to clarify, I was just kind of trying to
10 identify that there are areas, or for certain
11 parameters, where CCME water quality guidelines may
12 not be protective of a site-specific water quality, or
13 water body. An example would be mercury.

14 But for others, as a general rule of
15 thumb or as a principle, in accordance with the Land
16 and Water Board effluent policy, if -- if you can not
17 have a -- have a -- a contaminant concentration
18 released to the receiving environment, that would be
19 the preferred approach.

20 But if you have an effluent and it has
21 concentrations of potential concern in it, that if you
22 could minimize that to the extent possible, which
23 you've been achieving to do with your optimization
24 studies, and it shows that you can meet a standard,
25 which wh -- whether it would be a reference condition

1 or a CCME water quality guideline. But if -- if it
2 shows that you can meet that, then that might be the
3 appropriate standard to set as an objective for the
4 project. So I was just trying to highlight that
5 aspect.

6 MR. DAVID SWISHER: I appreciate the
7 clarification there. I -- I think from Avalon's
8 standpoint, and as Rick pointed out, you know, we feel
9 at this stage in the process, I think it was quite a
10 commitment for Avalon to basically indicate that our
11 proposed SSWQOs are going to meet the CCME guidelines,
12 just because the CCME standards that are out there
13 today are very well known in protecting aquatic life
14 and the environment.

15 So from Avalon's standpoint, we feel
16 very comfortable at this stage with what we've
17 proposed on the SSWQOs. I'm -- I'm sure that if it
18 were in other circumstances like I'm very familiar
19 with with other operations where they can't meet the
20 CCME, regulators would love nothing more than them to
21 meet CCME.

22 So I think we've really -- we're being
23 extraordinarily responsible in -- in proposing meeting
24 the CCME. But it doesn't mean that when we get into
25 the next stage of regulatory process with the Land and

1 Water Board that we can't sit down and -- and go
2 through the numbers in a bit more detail at that
3 stage. And of course Avalon is more than willing to
4 do that.

5 MR. NATHAN RICHEA: Thank you for that
6 answer. I appreciate the response. It's Nathan
7 Richea with the Water Resources Division. Yeah, I
8 just wanted to add that, you know, like I mentioned,
9 the mercury number, the CCME number for mercury is
10 based on toxicity assessments alone and it does not
11 account for biomagnification in the receiving
12 environment.

13 So that would be an example where CCME
14 may -- is not likely protective of biomagnification
15 potential and it -- and it gets exacerbated by the
16 potential for eutrophication in the receiving
17 environment by the release of nutrients such as
18 nitrates and ammonia.

19 Enhanced production in your receiving
20 environment will cause the speciation of mercury to
21 change, the natural occurring mercury within the
22 system. It methylates to a bio-available
23 concentration of mercury that it -- can also accrue in
24 organisms.

25 So not only is it the end of pipe

1 discharge that is a concern for mercury and the
2 potential for it to biomagnify, but also the potential
3 for eutrophication to cause enhanced methylation of
4 mercury in the receiving environment, not directly
5 related to the effluent discharge itself.

6 So that's why I'm trying to get a -- an
7 -- my request was to sort of get a handle on what the
8 natural background concentration for mercury would be
9 under a -- you know, using an ultra low detection
10 limit.

11 It would help us whether we use it in
12 this phase of the project or in the next one. If we
13 don't have that information we would just be using
14 judgment and pre -- precautionary, setting it
15 potentially to a lower level than we need to. But if
16 we have a background concentration we can assess what
17 the likelihood would that -- of that would be and what
18 the meaning of that would be when we're setting an
19 appropriate objective.

20 THE FACILITATOR MERCREDI: Just before
21 Avalon, so -- and just to kind of bring us back to --
22 to how this relates to the Review Board just for --
23 for the developer's clarification. Is there -- is
24 there -- relating to mercury and -- and the baseline
25 that Avalon has done, is something missing that would

1 kind of relate to a potential impact with respect to
2 mercury and -- and this discussion that's going on
3 here.

4 So -- because if there is then that is
5 definitely within the Review Board's purview to look
6 at. Could you describe relative to what is on the
7 record thus far in the -- the baseline reports that
8 they have and the developer assessment report, how
9 that might have been lacking. And again, this is for
10 the Review Board to hear and then -- and then Avalon
11 will be able to -- to answer after that.

12 MR. NATHAN RICHEA: Thank you. It's
13 Nathan Richea with the Water Resources Division. I
14 haven't completed an exhaustive review of the baseline
15 data, so I haven't conducted a exhaustive review. But
16 I have looked at the tables that have been provided
17 through other -- in the deve -- in the developer's
18 assessment report, the responses to our Information
19 Requests, and the most recent table that we received
20 today.

21 And looking at the concentrations that
22 are presented here it seems to me like the
23 concentrations are less than the detection limit,
24 which is the normal detection limit that we -- you
25 could use for a laboratory analysis, but it is not the

1 ultra low detection limit. Mercury is a very low --
2 has a very low concentration in the receiving
3 environment and you need to do an ultra low assessment
4 to detect what the actual concentration is.

5 But because there's a potential for
6 mercury to bio-accumulate and biomagnify in the
7 receiving environment, you need to understand what the
8 background concentration is of mercury and you need to
9 have that low-level detection to assess what the
10 impacts are from the project, whether it would be the
11 slightest increase of mercury being released. It
12 could cause an issue with biomagnification and -- and
13 contamination of fish tissue in the downstream. So
14 it's important from an impact assessment.

15 THE FACILITATOR MERCREDI: Okay. And
16 that was Nathan Richea with AANDC. And so just so I
17 understand, the -- so the less than detect showing up,
18 it -- it -- that is not the concentration -- it
19 doesn't give the actual concentration and -- and
20 because of that -- that is hindering AANDC's
21 understanding of the potential impacts from, for
22 example, mercury in this partic -- in this instance.

23 Would that be correct?

24 MR. NATHAN RICHA: That's correct.
25 And the discussion about mercury gets very complex,

1 like I tried to explain earlier today, but it --
2 there's a bunch of factors that factor into it. But,
3 yes, generally that is the -- that is the
4 understanding. Thank you.

5 THE FACILITATOR MERCREDI: Okay. And
6 that was Nathan Richea, with AANDC. Okay, just it's -
7 - it's -- as far as to be able to capture how this
8 would fit within -- again, within the Review Board's
9 sphere of influence, and that's just for -- that was
10 for clarification for the Review Board, does Avalon
11 have a comment on that? Thank you.

12 MR. RICHARD HOOS: Rick Hoos, with
13 Avalon EBA. I'm just looking at the -- the latest set
14 of -- of water quality data that were collected by our
15 colleagues for the Nechalacho project area. They
16 identified using a detection limit of 0.05 micrograms
17 per litre as the detection limit for mercury. I also
18 notice that the results that they reported were
19 reported as less than 0.01 micrograms per litre in --
20 in all of the waters.

21 I -- I do not profess to be a water
22 quality analyst. Could you tell me how much lower
23 than less than 0.01 micrograms one can actually
24 measure these days? And that's a serious question. I
25 just don't know the answer to it, but I -- maybe I

1 should. But I wondered if you knew the answer
2 because, I mean, it's pretty low.

3 MR. NATHAN RICHEA: Hi. It's Nathan
4 Richea, with the Water Resources Division. I -- I
5 guess I was a little confused with your question. You
6 mentioned that the detection limit was .05 micrograms.

7 MR. RICHARD HOOS: That's what it says
8 in this table, yes.

9 MR. NATHAN RICHEA: But the report was
10 less than 0.001 micrograms. And --

11 MR. RICHARD HOOS: Yeah.

12 MR. NATHAN RICHEA: -- that would be
13 an impossible scenario --

14 MR. RICHARD HOOS: Well.

15 MR. NATHAN RICHEA: -- because it
16 would be lower than the detection limit. So --

17 MR. RICHARD HOOS: Yeah. No, I
18 understand.

19 MR. NATHAN RICHEA: -- that's where
20 the confusion kind of lies. I don't really know --

21 MR. RICHARD HOOS: Yes.

22 MR. NATHAN RICHEA: -- what the
23 background concentration is. If it was less than
24 detection limit it would be less than point zero five
25 (.05). But you actually have it reported as less than

1 point zero zero one (.001).

2 MR. RICHARD HOOS: No, point zero one
3 (.01).

4 THE FACILITATOR MERCREDI: Just --
5 just to interject here, just so that we can capture
6 the discussion, who's saying what, just, yeah, one (1)
7 at a time, please.

8 MR. RICHARD HOOS: Yes, sir.

9 MR. NATHAN RICHEA: Were you done?

10 MR. RICHARD HOOS: Well, yes, I think
11 I was done. But I do -- certainly do agree with you,
12 Nathan, that there is some -- a little bit of
13 confusion in my own mind as to, you know, the table
14 indicates the detection limit is zero point zero five
15 (0.05). The numbers that they're reporting for
16 mercury in all these waters is less than zero point
17 zero one (0.01), which would suggest to me that maybe
18 the detection limit is 0.01 micrograms per litre,
19 which is a thousand times less than milligrams per
20 litre.

21 And I'm just wondering if the -- if the
22 technology exists to -- to measure mercury at
23 concentrations in water at less than 0.01 micrograms
24 per litre?

25 MR. NATHAN RICHEA: Thank you. It's

1 Nathan Richea, with the Water Resources division. I
2 believe the ultra low trace mercury detection is zero
3 point zero one (0.01). But then, yeah, my question
4 would be could I get clarification that the ultra low
5 was used for that sample because it would need to be
6 reported as less than zero point five (0.5).

7 MR. RICHARD HOOS: We can confirm that
8 with our colleagues at Stantec. But looking at this
9 data, it -- I would suggest that they are doing --
10 they are measuring it in the ultra low mode as it is.

11 I might further add that in our
12 assessment, in the DAR, I think we touched on mercury,
13 and we identified that there didn't seem to be any
14 significant potential for mercury accumulation or
15 bioaccumulation to occur because there isn't much
16 mercury coming out of the -- out of the system going
17 into the -- into the downstream receiving environment.

18 And furthermore, as -- as we know,
19 mercury in fish, as an example, is important if the
20 fish are being consumed by people primarily. Thor
21 Lake is not generally fished by anyone. Beyond that
22 though, it's also important to note that there are no
23 -- you know, the -- the key species that people
24 normally fish for, like lake trout in particular,
25 possibly grayling, they do not -- they do not occur in

1 this lake. This lake is -- has some whitefish and
2 pike and other coarse species in it.

3 The lake itself is also rather confined
4 by -- by a natural waterfall that it has, so fish can
5 leave the lake, but they can't come back into the lake
6 once they leave. And so there's a whole lot of
7 reasons why anything resembling significant potential
8 biomagnification with mercury is -- is most unlikely
9 to occur. But it certainly can still be -- if it is a
10 concern, it can form part of an EEM or, more
11 particularly, AMP program that will be prescribed for
12 this project.

13 Thank you.

14 MR. NATHAN RICHEA: Thank you. It's
15 Nathan Richea with the Water Resources Division.
16 Yeah, I don't want to get people bogged down in the
17 details here, but I guess I just have to explain my
18 last -- my -- my point again.

19 Looking at the table that was provided
20 today, if you have less than point zero one (.01) as a
21 background concentration for mercury in the receiving
22 environment --

23 THE FACILITATOR MERCREDI: If you
24 could just -- we're going micrograms, milligrams --
25 could you just clarify where that is.

1 MR. NATHAN RICHEA: -- micrograms --
2 less than 0.01 micrograms in the receiving
3 environment, and the CCME guideline is 0.026
4 micrograms per litre. The difference between that is
5 unclear because you don't really know what the
6 background concentration of mercury is because it's
7 less than zero point zero one (0.01).

8 So it could be 1 percent less or could
9 be a thousand times less. The issue is that mercury
10 can bioaccumulate. I don't want to belinger --
11 belinger -- linger the point, but there's two (2) ways
12 that mercury can cause an issue for impact assessment.

13 One (1) would be a release of mercury
14 higher than the background concentration into the
15 immediate receiving environment that would cause a
16 potential for biomagnification, but also the enhanced
17 enrichment of the receiving environment.

18 So if you are discharging nutrients
19 along with that mercury, you can cause eutrophication
20 that will methylate mercury that's naturally occurring
21 in that receiving environment, especially if it's a
22 low -- if it's a shallow sort of wetland-type area
23 that will cause methylation of mercury that can
24 bioaccumulate as well.

25 So there is a real potential for an

1 issue with mercury in this receiving environment, so I
2 just wanted to clarify that. And we can work with the
3 proponent where -- you know, this isn't like we don't
4 want to talk. Like, we -- we want to continue to talk
5 with you and -- and set up an appropriate site-
6 specific water quality objective. However, to do that
7 we need to understand a little bit better what the
8 background concentrations are and -- and have further
9 discussions with the company.

10 Thanks.

11 MR. DAVID SWISHER: David Swisher with
12 Avalon. Yeah, I -- I think, again, on the mercury, a
13 -- a -- a couple of the key points here. We can talk
14 about each one of these elements, you know, in -- in -
15 - in detail, and I certainly hear you with regards to
16 the mercury concerns.

17 The fact that it was detected down to
18 zero point zero one (0.01) -- it's less than that from
19 background -- I think is a very strong indicator that,
20 you know, the proposed SSWQO that we've -- we've
21 indicated at zero point zero two six (0.026) is -- is
22 still a very conservative approach.

23 Having said that, you know, again, we
24 know we're going to be discussing more of these things
25 in -- in more detail at the next phase of regulatory

1 process and Avalon has expressed it's -- it's very
2 much interested in having further discussions when we
3 get into the Land and Water -- Water Board process in
4 developing that water licence criteria.

5 I would certainly appreciate -- you
6 know, having said all of that, I would appreciate
7 knowing from -- from AANDC what they're suggesting the
8 detection limit be if it's -- if we're not -- if they
9 believe that CCME guidelines are not good enough. It
10 would be helpful to understand what AANDC is
11 suggesting those detection limits be.

12 THE FACILITATOR MERCREDI: Before
13 Nathan, I -- I will say that if the effluent has the
14 potential to cause some impact, it -- it's the Review
15 Board that makes the determination of the significance
16 of that first.

17 And so, if -- if there is evidence that
18 might point to that, it is important that the Review
19 Board consider that. So if there is evidence to
20 consider that suggests there's a potential and a
21 likelihood of there being an impact from -- from this,
22 either again through the effluent directly or through,
23 as you said, the -- the -- sorry, the nitrification.

24 And so, again, these are important
25 areas for the Review Board to look at. So it is still

1 within the Review Board's purview to look at as much
2 as it would be for the -- the Water Board to -- to
3 look at that as well. But the -- the determination of
4 the likelihood and significance of the impacts is very
5 much within the Review Board -- so within their
6 jurisdiction to look at.

7 So -- so just to kind of frame -- frame
8 that discussion and -- and how relevant it is to the
9 Review Board, I -- I would like to say that. So just
10 to put that out there.

11 MR. DAVID SWISHER: Thank -- David
12 Swisher, Avalon. Thanks, Paul. I -- I understand
13 that. I appreciate the clarification. I would only
14 just suggest that, again, the Proponent, Avalon, is
15 proposing to meet the CCME guidelines for the mercury.
16 And in the modelling that has been done, it's shown
17 the background at less than zero point zero one
18 (0.01).

19 So from our standpoint, we feel very
20 comfortable and confident with the -- the information
21 we provided. And, of course, with the homework that
22 we're going to do as suggested earlier on by many of
23 you, we'll have further clarifications, hopefully
24 tomorrow.

25 MR. NATHAN RICHEA: Thank you. It's

1 Nathan Richea with the Water Resources Division. I
2 just had one (1) thing -- I just wanted to -- I think
3 we talked about it, and I think you agreed that you're
4 going to confirm whether or not you used the ultra
5 low.

6 I think my first question was about
7 whether you did or not. It seems like you have, I
8 just want confirmation. That would be a good starting
9 point, so thanks.

10 MR. DAVID SWISHER: Yes, and if we can
11 do that as a homework item, Paul, then we'll get back
12 to you. David Swisher, again. We'll get back to you,
13 Nathan, on -- on confirming of the ultra low there.
14 Thank you.

15 THE FACILITATOR MERCREDI: And I --
16 out of the corner of my eye, I see Ralph just wanting
17 -- we'll -- and we'll let Simon get the wording there.
18 Ralph?

19 MR. RALPH GRISMALA: This relates to
20 the mercury issue. Ralph Grismala, ICF Marbek. The -
21 - you know, if you're looking at the ratios of the
22 table between the five (5) day decants and the
23 background concentrations and seeing what the outcomes
24 are for the model maximum values, it looks as though
25 for mercury that -- well, my -- my question is what

1 value was used for the five (5) day decant? Because
2 it's shown on the table as less than zero point one
3 zero (0.10).

4 Was it half of that number, or was it
5 that number? Because if it was half that number,
6 then, you know, the result looks reasonable compared
7 to the other numbers. But that result is very close
8 to the CCME guideline.

9 So if the actual number is closer to
10 point one (.1), rather than half that point one (.1),
11 your model will probably show that you're over the
12 CCME guidelines. So we would like clarification of
13 what numbers went into the model. And that should
14 apply to any of the parameters that have a less than
15 in the five (5) day decant concentration.

16 MR. JIM STRONACH: Yeah, Jim Stronach
17 here. Yeah, we would have always used half of the
18 detection limit for these calculations, which has that
19 potential error that you're -- not error, but
20 underestimate that you indicated.

21 MR. RALPH GRISMALA: Ralph Grismala,
22 ICF Marbek. The comment wasn't with regard to the
23 detection limit. It was with regard to the reported
24 decant concentration, unless that is also the
25 detection limit. But it's -- well, it's a magnitude

1 higher than the other number, so I'm guessing it's
2 something else? Or was it a different test?

3 MR. JIM STRONACH: Well -- Jim
4 Stronach here. I assume that was also a detection
5 limit issue.

6 MR. RALPH GRISMALA: Ralph Grismala.
7 Okay.

8 THE FACILITATOR MERCREDI: Thank you.
9 And, Simon, home -- homework number 5, I have?

10 MR. SIMON TOOGOOD: Simon with the
11 Review Board. This encapsulates it. Avalon will
12 confirm the lowest detection limit used for
13 calculating mercury for the site specific water
14 quality objectives. And I'll add to that to confirm
15 whether it was the ultra low detection limit.

16 THE FACILITATOR MERCREDI: Okay, and,
17 Nathan, this was during your line of questioning.
18 Does that capture your concern?

19 MR. NATHAN RICHEA: Thank you. It's
20 Nathan Richea, Water Resources. Yes.

21 THE FACILITATOR MERCREDI: Thank you.
22 And, again, that's homework, so it -- within -- within
23 the week. I would -- I would encourage those that are
24 asking the question to come -- either to come back
25 throughout the week, or else we'll have transcripts

1 posted hopefully every night, if not, by early next
2 week. And then that is something that -- that we can
3 move forward with.

4 With that, I will turn it back over to
5 Nathan. Any concerns on the homework there from
6 Avalon? That's a negative from -- from David Swisher.
7 With that, back to Nathan.

8 MR. NATHAN RICHEA: Thank you. I'm --
9 I'm going to move on a bit to the nutrient stuff. I
10 was just looking at the -- in preparation for the
11 technical session, I was looking at Table 4.7-6 from
12 the Developer's Assessment Report, page 505.

13 It talks a bit about nitrate release to
14 the environment. And it talks about potential
15 concentrations of ammonia in the process water and
16 concentrations of nitrates in the process water.

17 And I was just wondering if someone can
18 explain how -- whether those numbers are still the
19 numbers that are being used as part of the assessment
20 of these background concentrations or these twenty
21 (20) year model concentrations in the table that was
22 presented today because there's quite a bit different
23 -- difference in the numbers from the process water to
24 the model maximums in the receiving environment and
25 whether you're assuming some reduction naturally in

1 the polishing pond prior to release.

2 So I was just hoping I can get a
3 comment from the company on that.

4 THE FACILITATOR MERCREDI: And we'll
5 have -- we'll just let Avalon caucus for a few minutes
6 before they answer.

7

8 (BRIEF PAUSE)

9

10 MR. DAVID SWISHER: David -- David
11 Swisher here. Thanks for the short caucus. Yes,
12 those parameters haven't changed. Those are still --
13 still the same.

14 MR. NATHAN RICHEA: Thank you. It's
15 Nathan Richea with the Water Resources Division. So
16 am I correct in assuming that the concentrations in
17 the process water will be assumed to reduce to the
18 five (5) day decant that you proposed, I guess, in --
19 in the table? Or I guess maybe they're not actually
20 proposed in the table.

21 I'm just trying to understand how the
22 modelled average for ammonia goes -- gets to zero
23 point five (0.5) in the receiving environment when
24 it's assumed that the ammonia concentration in the
25 process water is about 3.47 milligrams per litre. And

1 then for nitrate, we're looking at about 11.95
2 milligrams per litre in the process water, and in the
3 receiving environment, it's modelled at less than 0.02
4 milligrams per litre.

5 THE FACILITATOR MERCREDI: And again,
6 I'll just allow Avalon to caucus.

7 MR. DAVID SWISHER: So I think we're
8 ready, Paul. Dave Swisher here.

9 THE FACILITATOR MERCREDI: Okay. And,
10 David...?

11 MR. DAVID SWISHER: Yeah. So
12 basically, to answer the question after -- David
13 Swisher here with Avalon, in discussions with Jim
14 Stronach, who did the modelling, he's of the belief
15 that we actually used more conservative numbers, so we
16 probably didn't use these numbers out of the DAR, so I
17 was corrected, so I apologized.

18 The indication was that he utilized
19 more conservative numbers for the modelling efforts.

20 MR. NATHAN RICHA: Thank you. It's
21 Nathan Richea with the Water Resources Division. That
22 helps a lot because I was trying to fill the gaps in
23 there. So I'm assuming you were thinking some
24 reduction naturally within the polishing pond prior to
25 release to the receiving environment as the main

1 reason for the difference, I guess.

2 Is that correct?

3 MR. DAVID SWISHER: Yes, that's
4 correct. David Swisher.

5 MR. NATHAN RICHEA: Thank you. It's
6 Nathan Richea with the Water Resources Division. And
7 I guess one (1) of the reasons why I was bringing it
8 up was in other operations in the north, we've seen
9 issues with nutrients, particularly nitrate, where it
10 doesn't sequester as much naturally, and there may be
11 a problem with -- with end of pipe type
12 concentrations.

13 So I just wanted to flag that just in
14 case, you know, there was an error or something, but
15 if -- if you got it worked out where a thirty (30) day
16 retention time within your polishing pond is going to
17 reduce it to a concentration that will meet the
18 objectives, then -- then yeah, I'm comfortable with
19 it.

20 I was just trying to -- I was trying to
21 make the connections, right, so. I think that's all I
22 have for now. I might have some further questions,
23 but I might give some other people some time.

24 THE FACILITATOR MERCREDI: David, go
25 ahead.

1 MR. DAVID SWISHER: Okay. Yeah, thank
2 you, Nathan, I was -- I was hoping that was it from
3 you. I -- actually we did just get confirmation of --
4 of -- we've completed, I think, homework number 5, was
5 it, regarding clarification on the -- and maybe Simon
6 can repeat the -- the homework regarding the -- the
7 mercury ultra low testing.

8 And I think that's homework number 5.

9 MR. SIMON TOOGOOD: I thought it was
10 number 7, but...

11 MR. DAVID SWISHER: Okay. Number 7.
12 So Rick Hoos would like to comment on that to complete
13 that homework assignment.

14 MR. RICHARD HOOS: Sorry, yes, we did
15 contact Stantec, and what they indicated was that up
16 until about 2009, the detection level limit that they
17 were using was point 0-five (.05), but from 2010
18 onward, they're now using a detection limit level of
19 .01 micrograms per litre for mercury.

20 So I guess maybe in hindsight, that
21 table should have been corrected to indicate a
22 detection limit of 0.01 micrograms per litre for
23 mercury which is what they've been using recently and
24 will continue to use for the time being. Thank you.

25 THE FACILITATOR MERCREDI: And that

1 was Rick Hoos with EBA for Avalon.

2 Nathan, any follow-up?

3 Okay. And thank you. Moving on to
4 Anne.

5 MS. ANNE WILSON: It's Anne Wilson
6 with Environment Canada. How does he know I'm bur --
7 bursting with more questions here. I'm thinking about
8 sediments, and as you noted, the report that
9 Environment Canada had commissioned highlights the
10 insolubility of the rare earth elements and the fact
11 that they really liked the sediments.

12 The poor water concentrations were
13 quite a bit higher than the water column
14 concentrations. Do you have any measurements of the
15 rare earth elements in sediments?

16 MR. RICHARD HOOS: Sorry. Rick Hoos
17 here. I would like a minute to just check the DAR. I
18 suspect that they may not have measured rare earth
19 elements in the lake bottom sediments, but I'm hoping
20 I'm wrong.

21 I say that because, of course, they
22 hadn't really measured rare earth elements in water
23 before recently as well, so allow me to just check
24 that and confirm it one (1) way or the other.

25

1 (BRIEF PAUSE)

2

3 MR. RICHARD HOOS: Okay. Rick Hoos
4 here. I'm just looking at page 82 of the DAR, and in
5 the laboratory methods, they do indicate that the REE
6 -- REEs were analyzed. They included the lanthanide
7 series, lanthanum to lutetium. Hopefully I'm
8 pronouncing it right, David.

9 MR. DAVID SWISHER: Lutetium.

10 MR. RICHARD HOOS: Lutetium. And I
11 don't even want to say the other ones. Promethium,
12 niobium, tantalum, ultrium, zirconium, and hafnium.
13 So they did, in fact, analyse for those parameters, as
14 well as radium 226, radium 228, lead 210, thorium 230,
15 and thorium 232.

16 So therefore, I'm hoping that we
17 presented those data at least in tabular form, or if
18 not, we would have referred to the -- the baseline
19 report of Stantec would have referred the reader to
20 that.

21 Yes, the full sediment analysis data
22 set for the work is available in Stantec 2010-C
23 Appendix A. Allow me another minute to see if they
24 came to any conclusions about the radionuclide values
25 and the REEs, specifically focussing on the REEs.

1 A large range of values were reported
2 for REEs across the study area in 2009. Tantalum and
3 hafnium were always low being reported at less than
4 detection at all twenty-four (24) -- twenty-four (24)
5 and nineteen (19) sample stations respectively.

6 So that was just a general comment we
7 did make. I guess we didn't see anything stand out.
8 Radionuclide values, which I know you weren't asking
9 about, but I can report on those as well here from the
10 DAR.

11 Radionuclide values were generally low
12 and ranged from less than point oh one (.01) to point
13 oh seven (.07) becquerels (phonetic) per gram for
14 radium-226. And the rest are all -- they're all below
15 the detection limits for the various parameters.

16 I -- I will add one (1) more. Sorry,
17 David, but there is one (1) other statement here that
18 says lead-210 was higher than other radionuclides and
19 ranged from less than zero point oh four (0.04) to one
20 point four (1.4) becquerels per gram.

21 Those are the findings from the --

22 THE FACILITATOR MERCREDI: Rick,
23 before you close that page, can you please just read
24 off the table number just -- just for a quick
25 reference for anybody following along in transcripts?

1 MR. RICHARD HOOS: It was a summary of
2 the results, and it's found on page 84, 85 of the DAR.
3 If you wanted to actually see the -- the values for
4 REEs, you'd have to actually go to the -- the Stantec
5 baseline report, which is an appendix to the overall
6 volume.

7 THE FACILITATOR MERCREDI: Okay, thank
8 you. Just, yeah, coordinates always help. So...

9 MR. RICHARD HOOS: Yeah. Rick Hoos.
10 And come to think of it, I know that when we first
11 submitted the DAR, we had submitted a sort of a next
12 to final draft. And I know somebody said, Well, you
13 said you sampled for REEs, but there's no results.
14 And that was true. They weren't in that la -- next to
15 final draft version of the -- the report.

16 So then at -- as per MVEIRB's request,
17 we then subsequently tabled the final final version of
18 the Stantec report, which did pre -- present all those
19 data. So they are available. And we did summarize
20 them in the DAR and found them to be low.

21 THE FACILITATOR MERCREDI: Thank you.
22 Anne, follow up?

23 MS. ANNE WILSON: It's Anne Wilson.
24 Thank you for that clarification. I will go and
25 check. I'm just curious to see what the proportion in

1 the water to the sediments looks like now we've got
2 the water measurements. That was helpful.

3 I do have one (1) other question on the
4 updated information. And now I'm switching to
5 tailings, if that's all right. The -- and it says
6 that the tailing solids, in the update to the project
7 description that was recently submitted, the tailing
8 solids will be allowed to overtop the initial
9 separator dike and extend to the east into the Buck
10 Lake -- Ball Lake basin area.

11 Are you anticipating having to control
12 wind erosion of the tailings if they would then be
13 subaerial? I was thinking because there may be
14 contaminants associated with those as well as TSS.

15

16 (BRIEF PAUSE)

17

18 THE FACILITATOR MERCREDI: Maybe we'll
19 just let Avalon to caucus? If you're -- if you're
20 asking, Anne, please speak through the mic.

21 MR. DAVID SWISHER: David Swisher.
22 Just for clarification, Anne, you're talking about the
23 update that we submitted which would have been the
24 July 3rd, 2012? Okay, thank you.

25 THE FACILITATOR MERCREDI: That was

1 affirmative, Anne? Sorry, I didn't catch that.

2 MS. ANNE WILSON: Anne Wilson. It was
3 on page 3 of that document. Thanks.

4 MR. KEVIN HAWTON: Kevin Hawton here
5 with Knight Piesold. Yeah, we've thought about dust
6 generation, and the way that's going to be controlled
7 is through strategic spigotting of the tailings to
8 maintain a wet beach. We also have some other waters
9 going out there, and if required, those will be
10 discharged over the tailings beach as required to
11 minimize dust generation.

12 MS. ANNE WILSON: It's Anne Wilson.
13 Thank you.

14 THE FACILITATOR MERCREDI: Go ahead,
15 Nathan.

16 MR. NATHAN RICHEA: Thank you. It's
17 Nathan Richea with the Water Resources Division. Just
18 to follow up on that last answer. What other waters
19 may be re -- may be reporting to your tailings
20 containment facility?

21 MR. DAVID SWISHER: David Swisher
22 here. Thanks. We just were wondering who is going to
23 answer that. So I guess I'll take that one (1) on.
24 So part of the waters we're talking about reporting
25 out there would be the waters that come from either

1 the surface runoff at the flotation plant and/or some
2 of the fresh water underground waters that we pump up
3 from the surface.

4 MR. NATHAN RICHEA: Okay. Thank you.
5 It's Nathan Richea with the Water Resources Division.
6 That's a good preamble for my next question. My other
7 question was about the surface runoff and -- and
8 whether it would be reporting to your tailings
9 containment area, but it sounds like yes, so we'll...

10 MR. DAVID SWISHER: David Swisher,
11 Avalon. That's affirmative. Yes, it will.

12 MR. NATHAN RICHEA: Perfect. Thank
13 you. It's Nathan Richea with the Water Resources
14 Division. After I finished my questioning there, I
15 realized that I don't have the -- the five (5) day
16 decant nutrient information.

17 The five (5) day decant is provided for
18 a bunch of other parameters in that most recent table
19 that was provided today. But I noticed that the five
20 (5) day decant for nutrients is not included in the
21 table.

22 I thought it was actually, that's why I
23 probably didn't ask for it. I was wondering if I
24 could get that -- those numbers that you used to -- to
25 model.

1 MR. DAVID SWISHER: Yes. David
2 Swisher, Avalon. Rick Hoos has just informed me we
3 have them right here, so we can provide those to you.

4 MR. NATHAN RICHEA: Thank you. It's
5 Nathan Richea with the Water Resources.

6 THE FACILITATOR MERCREDI: Just --
7 there's some great exchange here. That's -- that's
8 great. I just would like to remind all parties that
9 if there is to be an exchange of documents, I ask that
10 it come to the Review Board to be captured by the
11 Public Registry.

12 So again, if -- if concerns are to be
13 heard by the Review Board, that sort of thing. So
14 again, in that -- in that light, can we have that in -
15 - unless it was -- unless it was captured on the
16 transcripts, can we make that homework?

17 Again, it -- it probably is just a
18 fairly quick thing, but just so we capture it and then
19 again for the Public Registry, for the Review Board's
20 consideration. So with that, we'll go back to Simon
21 Toogood.

22 MR. SIMON TOOGOOD: Thank you. Simon
23 with the Review Board. I have this as Avalon to
24 provide the five (5) day decant for nutrients and the
25 -- I'm sorry, is there a title for this document?

1 Just the whole -- the document -- the tables you
2 provided.

3 Is -- should I -- is there a good
4 reference for this?

5 THE FACILITATOR MERCREDI: Paul
6 Mercredi with the Review Board. That -- I believe
7 that's in the -- the presentation that Avalon is
8 submitting for the Registry. Is that correct, David?

9 MR. DAVID SWISHER: David Swisher,
10 Avalon. Yes, that's correct.

11 THE FACILITATOR MERCREDI: Thank you.
12 With that we'll go to Simon again for wording.

13 MR. SIMON TOOGOOD: Thanks. Yes,
14 we'll just have that as Avalon to provide the five (5)
15 day decant for nutrients, again, in the table as
16 provided in the presentation.

17 THE FACILITATOR MERCREDI: And,
18 Nathan?

19 MR. NATHAN RICHEA: Yes, that sounds
20 right. Nathan Richea.

21 THE FACILITATOR MERCREDI: Thank you.
22 And again, homework within -- within the window of the
23 technical session, so I believe we've addressed that.
24 Nathan, anything further?

25 MR. NATHAN RICHEA: Thank you. It's

1 Nathan Richea with the Water Resources Division. I'm
2 going to change gears a little bit here. In the
3 presentation earlier today, we talked a bit about
4 optimization of the Nechalacho flotation plant and
5 using potentially different resins or you've been
6 trialing different resins.

7 Do you know what resins are currently
8 on the table right now for the floatation plant up at
9 the Thor Lake site?

10 MS. HENRIETTA NOTZL: Henri Notzl,
11 Avalon. It's not a resin. We use a number of
12 floatation chemicals that are reagents. There's about
13 six (6) different types that we use, and they're
14 standard in the floatation industry.

15 MR. DAVID SWISHER: David Swisher with
16 Avalon. I -- I could just add to that the -- the
17 table reagents should have been provided in the DAR as
18 well. Thank you.

19 MR. NATHAN RICHEA: Thank you. It's
20 Nathan Richea with the Water Resources Division. So
21 the -- the table in the DAR is the -- there's no new
22 reagents that are being proposed to the optimization?
23 That list is exhaustive, and there's no other ones?

24 MS. HENRIETTA NOTZL: Henri Notzl,
25 Avalon. In our optimization, there could very well be

1 a different type of chemical, but it has yet to be
2 confirm -- confirmed; a different reagent we're using
3 at the moment, unique to rare earths.

4 MR. DAVID SWISHER: David Swisher with
5 Avalon. To that end as well, the reagent table that
6 we provided for in the DAR is actually under
7 consideration as well, and that reagent, or the suite
8 of reagents that are used, could be significantly
9 reduced in our optimization efforts.

10 MR. NATHAN RICHEA: Thank you. It's
11 Nathan Richea with the Water Resources Division.
12 Yeah, I guess just the premise for my question is what
13 potentially could be -- could we see in the tailings
14 water, right, if a different reagent is used. That's
15 not on the list. So I was just curious. I know
16 you're doing some optimization. And if there is a
17 different one (1), can you let us know? Because we're
18 trying to in -- we're interested in looking at what
19 the potential change in the concentrations that will
20 report to the tailings containment facility may be, so
21 just to let us know if they have changed things.

22 MR. DAVIS SWISHER: Yes. And
23 currently we haven't changed from the current reagents
24 scheme. Obviously we're doing several different
25 optimizations to see what we can do with the -- the

1 key optimization, being the reduction of the amount or
2 reagents that's in the DAR right now.

3 That, to us, is more important just
4 because of the -- I think in the DAR, we had about
5 4,000 tonnes of reagents annually being shipped north.
6 Obviously that's a cost, so we're trying to reduce
7 those costs.

8 If it does look like we may be
9 utilizing another reagent that's maybe specific to
10 help in the extraction of the rare earths, then we
11 certainly would make that present either during this
12 period or at the next stage, regulatory process.

13 THE FACILITATOR MERCREDI: And just to
14 capture that, as a commitment within this
15 environmental assessment, should the reagents change
16 within the CA, I'd like to capture that as a
17 commitment that the Board be notified as soon as -- as
18 possible of that just because obviously there are, no
19 pun intended, some downstream considerations from
20 that.

21 So can we take that as Commitment
22 number 1 within the technical session?

23 MR. DAVID SWISHER: David Swisher,
24 Avalon. Yes.

25 THE FACILITATOR MERCREDI: Thank you.

1 --- COMMITMENT NO. 1: Should the reagents change
2 within the CA, Avalon
3 notify the Board as soon
4 as possible of that

5

6 CONTINUED WITH QUESTION PERIOD:

7 THE FACILITATOR MERCREDI: And while
8 we let Simon get the wording, Ralph had a question.

9 MR. RALPH GRISMALA: Ralph Grismala,
10 ICF Marbek. Just a question on the -- I -- I believe
11 you're referring to Table 4.7-1 in the DAR. And just
12 as I -- I look at it now, there seems to be perhaps
13 some ambiguity in the way the table's labelled.

14 The title is "Average reagent
15 consumption," but one (1) of the columns says, "Life
16 of mine," so it's not clear to me. And -- and when
17 you phrased it, you said it was 4,000 -- 4,000 tonnes
18 a year, which appears to be roughly the sum of the
19 individual components.

20 So is that -- is this a table of annual
21 values or life of mine values?

22 MR. DAVID SWISHER: David Swisher with
23 Avalon. Ralph, could you clarify what page that's on?

24 MR. RALPH GRISMALA: Page 485. I'm
25 sorry, Ralph Grismala. Page 485.

1 MR. DAVID SWISHER: David Swisher,
2 Avalon. Yes, I can confirm that these are annual
3 usages.

4 MR. RALPH GRISMALA: Ralph Grismala.
5 Thank you.

6 THE FACILITATOR MERCREDI: And we'll
7 have Simon to repeat the wording there before we
8 break, have a quick health break.

9 MR. SIMON TOOGOOD: Just like bullet
10 points of clari -- sorry, Simon Toogood, with the
11 Review Board. I have the basic question being:
12 Should the proposed types of reagents change, Avalon
13 will notify the Review Board -- I would just ask the
14 reagents to be specific, that's for the -- for which
15 part of the process?

16 MR. DAVID SWISHER: David Swisher,
17 Avalon. That would be Nechalacho flotation plant.

18 MR. SIMON TOOGOOD: Thank you very
19 much. And just to get into the timing, when do you
20 expect that you would have your final listed reagents
21 with the future studies and such?

22 MR. DAVID SWISHER: I'm sure Henrietta
23 could add to this, but my experience in working with
24 Ms. Notzl is that we -- we are always in an optimizing
25 state. And currently right now, you know, we're --

1 we're trying several different things to -- to
2 minimize that re-usage. So what we've provided in the
3 DAR, just like so many areas within the DAR that we
4 provided, we took a conservative approach just to make
5 sure that when people were looking at it or analysing
6 it they were looking at it from a worst case scenario.
7 Thank you.

8 MR. SIMON TOOGOOD: I just want to
9 make sure I'm not making -- writing down a commitment
10 that perhaps goes beyond the EA stage of this project.
11 Will this be done presumably before the EAs?

12 MR. DAVID SWISHER: In terms of --
13 David Swisher, Avalon. In terms of definitively
14 saying finalized schemes, unfortunately in the
15 industry I don't think there's ever anything that's
16 finalized. So Avalon would be hesitant to say
17 finalized before the EA process, no. But with regards
18 to having a confirmation of any adjustments to the
19 reagent scheme that is proposed under the DAR, yes.

20 MR. SIMON TOOGOOD: Fair enough. So
21 essentially, you have a question being should the --
22 should the proposed types of reagents change from the
23 -- the list set out in the DAR for the Nechalacho
24 flotation plant, Ava -- Avalon will notify the Review
25 Board?

1 THE FACILITATOR MERCREDI: Yes. Okay,
2 I'm thinking maybe a couple more just before the
3 break, if there's any from...?

4 MR. NATHAN RICHEA: Hi there. It's
5 Nathan Richea with the Water Resources Division. I
6 want to talk a bit about the toxicity testing and a --
7 a couple of questions, I guess, for the company. I
8 just need to find my papers.

9 The toxicity testing that was recently
10 completed, I think it was in April or something --
11 April, May, something like that, showed some chronic
12 toxicity for ceriodaphnia dubia, I think. And just
13 wondering if we can get an explanation from the
14 company on the potential reasons for the potential
15 failures from some of the chronic toxic -- chronic
16 toxicity testing?

17 THE FACILITATOR MERCREDI: A moment
18 for Avalon to caucus.

19 MR. RICHARD HOOS: Okay, it's Rick
20 Hoos here. I guess probably the simplest thing to do
21 is to once again read from one of the responses I
22 think that -- that Nathan must be referring to. It's
23 on page 3 of -- or a response to April 16th
24 clarification questions. The date of the submission
25 was May 10th. And with respect to the sub-lethal

1 chronic:

2 "Sub-lethal/chronic reproduction
3 tests for the inverted -- for the
4 invertebrate ceriodaphnia..."

5 Is that -- that's what you're talking
6 about Nathan? What we indicated was:

7 "Some inhibition of reproduction
8 rate was observed in the treated
9 effluent, where we said an IC-25 of
10 63.5 percent. Less inhibition --
11 [that's in the effluent]. Less
12 inhibition was noted for the
13 effluent Drizzle Lake blend, IC-25,
14 75 percent. And about a 15 percent
15 inhibition was reported for the
16 Drizzle Lake water only."

17 So even Drizzle Lake water, without
18 effluent at all, was causing some inhibition. It is
19 noted that -- reading on:

20 "It is noted that there were no
21 mortalities in the final effluent
22 test [this is chronic] while there
23 were some in the blended waters and
24 Drizzle Lake water."

25 In other words, the Drizzle Lake water,

1 in some respects, was more deleterious than the
2 effluent, but interestingly, only in diluted samples
3 and not in the 100 percent concentration sample.

4 "It is also noted that all three (3)
5 waters behaved in a similar manner
6 with the impairment only in the
7 sample of undiluted solutions."

8 So basically, I guess what it is -- is
9 really showing is that these re -- these -- these
10 kinds of chronic tests are -- are sensitive and, in
11 some respects, may not even allow you to explain some
12 of the variations or variability that occurs between
13 tests.

14 But here we have a situation where the
15 Drizzle Lake water, in itself, in -- in some respects
16 was of having comparable effects or maybe even worse
17 effects than the effluent did in some cases.

18 There's another comment about an algae
19 that was also tested for sub-lethal chronic growth
20 tests. And that actually suggested that there was
21 some stimulation of the algae:

22 "All waters tested had IC-25 values
23 greater than ninety point nine one
24 (90.91)."

25 I think really what these results are

1 showing is that if there is a -- a measurable effect,
2 it's very minimal and -- and applies -- can -- can
3 conceivably apply, as it did in this case, to either
4 the whole effluent, a mixture of effluent in Drizzle
5 Lake, and even Drizzle Lake itself without any input
6 of effluent.

7 So it's -- it's right on the verge of
8 what does all this mean. It's -- it's very close to
9 the edge, and I'm not sure one (1) would want to
10 interpret too much more than that from this data.

11 MR. NATHAN RICHEA: Thank you. It's
12 Nathan Richea with the Water Resources Division.
13 Yeah, I was just trying to get an understanding of
14 whether the proponent had a understanding of the cause
15 of the potential chronic toxicity.

16 I guess one (1) of the questions I had
17 was it sed -- it says here:

18 "Some inh -- inhibition of
19 reproduction rate was observed in
20 the treated effluent."

21 But later on in the section, it says
22 there was no chronic toxicity in 100 percent water.
23 So what do you mean by treated effluent? I was
24 confused by that because I thought there wasn't
25 toxicity in the effluent, but then it says that there

1 was some toxicity in the effluent within the same
2 paragraph.

3 So I was confused.

4 THE FACILITATOR MERCREDI: Rick, if
5 you could please speak through the mic. Yeah, for
6 sure.

7 MR. DAVID SWISHER: Nathan, could you
8 -- David Swisher, Avalon. Could you clarify the
9 information you're reading from, the source?

10 MR. NATHAN RICHEA: Thank you. It's --

11 THE FACILITATOR MERCREDI: And if you
12 could just turn off the mic to your left there, David.
13 Thank you.

14 MR. NATHAN RICHEA: Thank you. It's
15 Nathan Richea with the Water Resources Division.
16 Yeah, it's the second sentence in the third paragraph
17 with respect to sublethal chronic reproduction tests
18 for invertebrates ceriodaphnia dubia.

19 Some inhibition of reproduction rate
20 was observed in treated effluent. But then further
21 down, it says there was no mortalities in the final
22 effluent test. It seems to me the mortalities is
23 referring to acute toxicity whereas the inhibition is
24 chronic toxicity in the effluent.

25 So I can just preference sort of where

1 my question is coming from. When we look at setting
2 site specific water quality objectives in a receiving
3 environment, we try to minimize the zone of chronic
4 toxicity.

5 To do that, you need to understand how
6 your effluent will behave in the mixing zone or in the
7 receiving body and if there is chronic toxicity. And
8 the results are kind of confusing, and maybe -- it may
9 just be the way that it's presented here, but it seems
10 like there is chronic toxicity, the potential for
11 chronic toxicity, and it's not clear what the cause of
12 the chronic toxicity is.

13 And it's part of an assessment of what
14 the impacts of the effluent will be on the receiving
15 environment need to assess what may be causing the
16 chronic toxicity in the receiving environment.

17 And it's of particular importance if
18 we're going to treat the entire lake as a mixing zone
19 if the end of the lake, or the outlet of the lake, is
20 the potential mixing zone boundary or the place that
21 we applied the site specific water quality objectives.
22 So that's my premise for my concern.

23 THE FACILITATOR MERCREDI: And just
24 before Avalon responds, can you give a -- a specific
25 example? Or can -- or you can -- as far as it relates

1 to -- to this?

2 MR. NATHAN RICHEA: I don't understand
3 your question. It's Nathan Richea. I don't
4 understand your question, but basically what I was
5 trying to suggest is MMER regulations state that you
6 need to have no acute toxicity at the end of pipe, and
7 it allows for a zone of chronic toxicity in your
8 receiving environment.

9 When we're looking at setting --
10 setting up site specific water quality objectives for
11 the receiving environment, we need to consider what
12 the zone of chronic toxicity may be.

13 And it seems as though the potential
14 for the blended effluent to cause chronic toxicity in
15 the receiving environment. It's not clear why that's
16 happening, but it may mean that we need to do
17 additional testing to understand the differences
18 between how the effluent behaves in the receiving
19 environment and how the effluent may influence through
20 synergistic effects.

21 That synergistic effect is a number of
22 parameters working together to cause chronic toxicity.
23 It may not be the synergistic effects of the effluent
24 itself. It may be synergistic effects between the
25 effluent once it's mixed with Drizzle Lake water

1 because there could be conditions or other parameters
2 in Drizzle Lake that is causing the toxicity once it's
3 blended.

4 And that's been demonstrated in the
5 literature. Some -- sometimes you will have chronic
6 toxicity once, and effluent is released to the
7 receiving environment because you can't control for
8 the parameters that are already there.

9 THE FACILITATOR MERCREDI: Okay. So I
10 have a couple questions. First of all, the -- when
11 you say "the literature," are you referring to the
12 studies that are on the record?

13 MR. NATHAN RICHEA: No, I'm talking
14 about scientific literature.

15 THE FACILITATOR MERCREDI: Okay, so.
16 And so for -- are -- so are you speaking in general,
17 the synergy in general, or are you referring
18 specifically to the effluent that Avalon is proposing
19 to discharge?

20 MR. NATHAN RICHEA: I'm speaking about
21 the synergy in -- in general as a potential cause for
22 the toxicity. But I was hoping to get an explanation
23 from the company on what they feel is causing the
24 toxicity in their effluent.

25 If you run toxicity tests and it shows

1 that you may have acute toxicity, well, then you got
2 an issue and you got to figure out why. If you run
3 toxicity tests and it shows that you may have poten --
4 chronic toxicity, we also need to understand why. And
5 it's particularly relevant when we set site specific
6 water quality objectives and assessment zones, like
7 assessment boundaries, like the mixing zone boundary.

8 If the zone of mixing is going to be
9 the entire lake, then the potential for chronic
10 toxicity will -- will exist in the entire lake.
11 That's important from an assessment standpoint. So
12 that's the premise of the question.

13 THE FACILITATOR MERCREDI: For sure.
14 I just wanted to clarify where we were at. I -- I
15 think I'm comfortable with that. Avalon...?

16 MR. RICHARD HOOS: Okay, Rick Hoos.
17 The -- the answer that we provided to you was as -- as
18 was read out. The answer indicated that -- and we're
19 now -- we are talking about sublethal chronic toxicity
20 testing looking at reproduction rates.

21 And what this document indicates or
22 what we reported was that there were, in fact -- there
23 were some mortalities even. Even though this was a
24 long-term test looking at reproduction, there was some
25 mortalities in the test organisms, but none occurred

1 in the actual 100 percent effluent. Some occurred
2 with the mixture of Drizzle Lake and the effluent, and
3 some occurred with just Drizzle Lake water.

4 We need to point out that that water
5 from Drizzle Lake was actually collected when there
6 was still an ice cover over the lake. In fact, we had
7 a hard time finding any water at all. But we were,
8 ourselves, concerned that by collecting water from
9 Drizzle Lake in the wintertime, we might actually be
10 introducing some potentially harmful parameters in the
11 water because we have already learned from the year-
12 round monitoring that the lake does go anoxic. And in
13 the process of going anoxic, it results in the
14 liberation of a number of other parameters, iron being
15 one (1), ammonia being another.

16 So it's -- you know, those were the
17 conditions under which this work was carried out. It
18 should also be pointed out that the suite of testing
19 that was done was consistent with the expectation and
20 requirements of the Metal Mining Effluent Regulations,
21 which require you to do acute toxicity testing and
22 chronic testing, the results, all of which are used
23 not on a one (1) time only basis but over -- over an
24 extended period of time to determine whether you, in
25 fact, have some kind of thing -- some kind of issue

1 that you need to be concerned with.

2 We would not feel that it's appropriate
3 to -- to assume that every chronic test that might be
4 done with this effluent in the future will result in
5 this -- will produce the same kind of results. This
6 was the first time it's ever been done. These were
7 the results that we obtained.

8 We were encouraged by the fact that the
9 effluent itself did not seem to elicit the -- the
10 minor effects on reproduction for this that the
11 Drizzle Lake water itself did. And we just took these
12 results at face value.

13 We did not assume, and it's not
14 reasonable to assume, that this kind of chronic impact
15 would necessarily occur all the time, nor would it be
16 reasonable to assume that this kind of limited impact,
17 mostly it seems due to the -- the receiving water of
18 Drizzle Lake, would necessarily carry over to the
19 downstream lakes.

20 We have lots of information which has
21 been presented to the Board and even discussed here
22 today which shows that the water quality of Thor Lake,
23 as an example, where the fish do thrive, is
24 considerably better than the water quality of both
25 Drizzle Lake and Murky Lake. And certainly Avalon's

1 objective is to ensure that all three (3) of the lakes
2 don't change appreciably, or at all. And particularly
3 Thor Lake, where the fish are -- are thriving.

4 MR. NATHAN RICHEA: Thank you. It's
5 Nathan Richea with the Water Resources Division.
6 Thank you for your response. Yeah, no, I was just
7 trying to understand. I think maybe you alluded to it
8 in your response that there was no inhibition of
9 reproduction in treated effluent.

10 But I think the first sentence there
11 sort of says that there was some inhibition or
12 reproduction in the treated effluent. So I just
13 wanted to clarify that for the record.

14 So the effluent did have some chronic
15 toxicity, and we just want to make sure that when we
16 assess site specific water quality objectives and we
17 apply them to a zone in the receiving environment, we
18 account for the potential for chronic toxicity.

19 I don't really have anything more
20 specific on the issue of toxicity testing. It's -- I
21 guess the only other comment I had, would -- would you
22 consider running confirmation toxicity testing, at
23 least for ceriodaphnia dubia, to see if this is a one
24 (1) time event? And if that -- and, you know, maybe
25 it was a one (1) off?

1 MR. MARK WISEMAN: Mark Wiseman,
2 Avalon. Yeah, we're certainly going to be doing more
3 of that kind of testing as we con -- continue to
4 refine the -- the details of the process. When we've
5 got our best guess of where we're going to go, we will
6 definitely do another series of tests.

7 MR. NATHAN RICHEA: Thank you. It's
8 Nathan Richea with the Water Resources Division. Do
9 you have any idea of when you may be able to produce
10 another simulated effluent and do the testing? Would
11 that be in the next couple of months, or do you have
12 any idea?

13 MR. DAVID SWISHER: David Swisher with
14 Avalon. I think from our perspective, we're -- like I
15 mentioned before, we're -- we're continually working
16 on that optimization process. It really depends on --
17 on where the concerns are and -- and where they lie,
18 and do we believe that we can have something prior to
19 water licence.

20 I think prior to water licence
21 initiation, yes, of course, we're going to have more
22 time well after that to develop and, of course, as
23 Rick has mentioned in our AEMP plan, we're going to be
24 doing a lot more of these tests follow up to that.

25 So in terms of -- of when we're going

1 to have that, you know, we're -- we're committed to
2 continuing -- to continue to optimize. But, you know,
3 we're -- we're at a -- at a stage now where we're --
4 we're just making sure that we make sure we have what
5 we need before distributing.

6 And I think the point being that these
7 tests were, again, just as many things in the DAR are,
8 done under conservative circumstances, if you will.
9 In this case, if we wanted to try and show these tests
10 as being positive, we certainly wouldn't have waited
11 for the conditions where there was still some ice on
12 the lake to take that test and -- and do those types
13 of analysis.

14 I think if we were to do those tests
15 again, say in the -- the spring or summer, spring
16 freshette or summertime, you would see a much
17 different story, you know, from that.

18 So I think the conservative nature
19 itself, I think, lends comfort to the test work we
20 have done. But I think as Mark just indicated, you
21 know, we're committed to doing more of those tests.
22 When, we couldn't tell you because we're still, and
23 Henrietta is still, diligently working on that
24 optimization process.

25 MR. NATHAN RICHEA: Thank you. It's

1 Nathan Richea with the Water Resources Division.

2 Yeah, I can just add a little thing before coffee or
3 something. Yeah, and thank you for your response.

4 And I know toxicity testing, you can
5 run them over and over and over again, and thank you
6 for committing to doing that as the process for
7 optimization continues.

8 I guess just to get back to, I guess,
9 why am I raising it. It's -- if -- if the effluent
10 that you're testing right now is -- is under CCME, and
11 we have the potential for chronic toxicity, and maybe
12 confirm that we don't have chronic toxicity if we do
13 additional testing.

14 But right now, as a reviewer tasked
15 with providing advice to the Impact Review Board, if
16 the effluent that is being tested is less than CCME
17 and there's results to suggest that there is potential
18 chronic toxicity, and then CCME is proposed as the
19 site specific water quality objective.

20 You know, you put those lines together,
21 and you think that there is potential for chronic
22 toxicity in Drizzle Lake. And if the end of Drizzle
23 Lake is the assessment boundary for the site specific
24 water quality objectives, there is a potential for
25 chronic toxicity in the entire lake over the twenty

1 (20) year period, which needs to be considered, and it
2 affects the assessment, right?

3 And as a reviewer looking for -- to
4 provide advice to the Board, I'm just trying to get
5 that out and whether or not we can confirm through
6 additional testing and if that -- if those come in
7 prior to our technical submission, that would be
8 really, really useful. Because it would hopefully
9 head off this issue before writing in our submissions
10 for a technical report. So thanks.

11 MR. DAVID SWISHER: David Swisher here
12 again. Appreciate that, Nathan. I -- I certainly
13 understand your -- your position there. And I would
14 just like to remind the Board that, fortunately,
15 Drizzle Lake, having been a sample for two (2) years
16 in a row with no fish in it, and it wasn't until the
17 latest sampling effort that they actually did catch a
18 juvenile pike that -- in the -- the inlet portion of
19 Drizzle, understanding that it doesn't support fish.

20 So from that standpoint, I just want
21 the Board to understand that -- that, you know, we're
22 fortunate from that regard with regards to that --
23 that discharge as well, which is another, I think,
24 benefit for the project and how it's designed.
25 Thanks.

1 THE FACILITATOR MERCREDI: Thank you.

2 We'll take a ten (10) minute health break here, and
3 then we'll launch back into questions for water
4 quality topic of the day. And with that, ten (10)
5 minutes.

6

7 --- Upon recessing

8 --- Upon resuming

9

10 THE FACILITATOR MERCREDI: Okay, this
11 is Paul Mercredi, with the Review Board. Marc, do you
12 have any questions here?

13

14 (BRIEF PAUSE)

15

16 THE FACILITATOR MERCREDI: Well, go
17 ahead, and we'll get back to Nathan. I'm sure he's
18 got some more.

19 MR. MARC CASAS: Okay, Marc Casas,
20 with the Mackenzie Valley Land and Water Board. And I
21 ha -- my questions are mostly, I think, just points of
22 clarification.

23 And the first one (1) is a lot of
24 important numbers are -- are based on the five (5) day
25 decant numbers that -- that are -- that led to the

1 water quality objectives, site-specific water quality
2 objectives. And I'm just wondering if you could maybe
3 walk me through the process of -- of where that five
4 (5) day decant water came from.

5 Is that from a bulk -- like was it
6 processed like in -- as a bulk sample, or -- or where
7 do those -- where do those numbers come from?

8 MR. DAVID SWISHER: We've -- David
9 Swisher, Avalon. We've conducted several tests
10 throughout on the flotation plant regime, and so those
11 are not a result of the bench scale, but a result of
12 the pilot plant that we have ran in the past.

13 MR. MARC CASAS: Okay. Marc Casas,
14 Mackenzie Valley Land and Water Board. So it's
15 actually like effluent that came out of -- of an
16 actual process that was actually processed. Is that
17 correct?

18 MR. DAVID SWISHER: David Swisher,
19 with Avalon. Yes, I can ask Henrietta Notzl to
20 explain what a pilot plant -- how a pilot plant
21 generally is -- is set up and the constituents that go
22 into a pilot plant that represent the process.
23 Henrietta?

24 MS. HENRIETTA NOTZL: Henri Notzl,
25 Avalon. The way the pilot plant works is it's a

1 flotation system. And the liquid that comes off, it
2 goes into thickening, and the overflow from that cre -
3 - is created, and it should be clear of all solids.

4 And we use flock in the thickening to
5 be able to drop out the solids. And that clear
6 solution then is analyzed through a series of tests.
7 There's quite a number of tests for both the solids
8 and for the solutions, including just shake tests for
9 the solids to make sure everything's okay. So we can
10 give you a list of all of that if you want.

11 MR. DAVID SWISHER: Yeah, David
12 Swisher, with Avalon. I think at the end of the day -
13 - sorry, I'm eating a carrot. At the end of the day,
14 the pilot plant is representative of the actual
15 flotation plant that'll be operating there on a
16 smaller scale.

17 MS. HENRIETTA NOTZL: Henri Notzl,
18 Avalon as well. I should mention that it's -- we only
19 do the testing after stability has occurred within the
20 pilot plant.

21 MR. MARC CASAS: Okay. Yeah, that's
22 helpful information. I guess where I was sort of
23 going to with -- with some of these numbers is I know
24 in some other mines that a lot of times the
25 underground water is used as water as part of -- in

1 part of the process plant. And sometimes that
2 underground water can have high, like, total dissolved
3 solids, which the main constituent is stuff like
4 chloride and stuff like that.

5 And so I guess I'm wondering if -- if
6 this particular five (5) day decant would be
7 representative of -- of the process say, you know,
8 towards the end of mine life or throughout mine life
9 of -- of some of the water that may be coming from the
10 underground.

11 MR. DAVID SWISHER: The five (5) day
12 decant is not representative of any underground water.
13 The underground water in this case, in our situation,
14 we're in a good situation where we don't have to use
15 the underground water in the process plant, so we will
16 not be doing that, no. David Swisher, Avalon.

17 MR. MARC CASAS: If I can clarify
18 though, that will report to the tailings facility,
19 correct?

20 MR. DAVID SWISHER: David Swisher.
21 Yes, that'll report to the tailings facility.

22 MR. MARC CASAS: Marc Casas, from Land
23 and Water Board. So, yeah, I guess ultimately sort of
24 what I'm getting at is I -- I looked at some of the --
25 the numbers on this handout that you've provided

1 earlier today, and -- and realize actually that the
2 five (5) day decant numbers are not here for the
3 nutrients and ions.

4 So I was wondering, particular
5 attention on, say, chloride or -- or TDS, or chloride
6 as a representative of -- of TDS numbers of -- of
7 whether these -- these numbers would be expected to go
8 up if you do start to -- as you go into the
9 underground and -- and get into some of that
10 underground water.

11 So that's -- that's one (1) question.
12 Well, maybe I'll just let you answer that question
13 first.

14 MR. DAVID SWISHER: David Swisher with
15 Avalon. Yeah, one (1) of our homework items of
16 tonight is to provide the -- the day five (5) decant
17 for the nutrients, which we will be providing.

18 MR. MARC CASAS: Marc Casas. But a
19 day five (5) decant won't include the potential
20 underground water. Is that correct?

21 MR. DAVID SWISHER: That is correct,
22 and we don't feel we need to because the -- the way
23 that we've conducted the test now is more
24 conservative. If anything, that will create more
25 dilution for the process. Dave Swisher, Avalon.

1 THE FACILITATOR MERCREDI: And if I
2 can just -- should this -- could you describe how the
3 absence of that might affect the Review Board's
4 consideration, and if it -- if it does, if there is a
5 potential impact to be had from the underground water,
6 can you describe what that would be for the Review
7 Board if -- if that is the case?

8 MR. MARC CASAS: Okay. Marc Casas.
9 I'll -- I'll just get to the point then. I guess
10 potent -- I -- my question is: Is there the potential
11 to go into say connate water, in which case you may be
12 getting elevated numbers -- levels of chloride in TDS
13 through -- like as you go through mine life.

14 And if that's the case, it has a
15 potential to have like much higher numbers than --
16 than are provided in this table. Although, I guess we
17 don't have the five (5) day decant numbers, but -- but
18 I'd assume they're at least less than CCME, which is
19 the -- the 120 milligrams per litre.

20 So I guess the appen -- potential
21 impact would be if, through the mine life, you do run
22 into connate water, that there is potential to have
23 impacts to the downstream environment, and -- and
24 therefore the numbers provided here might be a little
25 low.

1 MR. DAVID SWISHER: David Swisher with
2 Avalon. Just for clarification, they -- we -- we
3 aren't going to be adding salt to any of our water for
4 underground. There's no need to do that. We won't be
5 adding any of the additives, if you will, into the
6 water itself or underground. There simply won't be a
7 need for that.

8 And I think the -- the -- at the end of
9 the day, what we're committing to is -- is -- or, in
10 the -- or what we're proposing to meet under our
11 SSWQOs, we're proposing to meet those at a -- at a
12 minimum right now.

13 And of course when we get into the next
14 stage of the process, as we've discussed with AANDC
15 and EC, we'll be discussing, you know, individual
16 levels that may or may not need to be adjusted based
17 on the CCME guidelines.

18 MR. MARC CASAS: Marc Casas. Okay.
19 Maybe I could just get some clarification on -- on
20 whether -- I know you're not going to be adding salts,
21 but if you do, my question was: Do you expect to run
22 into this connate water, which -- which has these
23 elevated salts in them, not that you -- you have to
24 add them, but if you do go deep enough for -- or -- or
25 potentially hit connate water, the -- you will get

1 high levels of TDS and -- and chloride as a main
2 constituent of that.

3 So I guess that's -- that's what I'm
4 concerned about. And if -- if you know that you're
5 not going to hit the connate water, then -- then maybe
6 you can clarify that. Thank you.

7 MR. DAVID SWISHER: David Swisher with
8 Avalon. Thanks, Marc, for that clarification. I
9 think I understand where you're coming from now.
10 Yeah. No, so there is no case in which we're going to
11 be adding salt into the waters. And with the test
12 work that we've done through Knight Piesold, through
13 others at the site, we know there is no connate water
14 there that we would encounter.

15 MR. MARC CASAS: Thank you. Another
16 one (1) of my questions was that a lot of -- a lot of
17 the numbers provided are -- are concentrations, and --
18 and I haven't seen much discussion about volumes or
19 flows. And I'm wondering sort of how much confidence
20 you guys have with the volumes that you guys have --
21 have used to come up with some of these numbers and if
22 you used, like, a range of numbers, or how did you
23 come around getting those flows, or what conservative
24 numbers did you use?

25 MR. DAVID SWISHER: David Swisher with

1 Avalon. Could you clarify for me, Marc, which numbers
2 you're looking for flows? Are you referring to the
3 underground flows?

4 MR. MARC CASAS: Yeah, I guess mainly
5 underground flows, but I guess ultimately what it --
6 it's looking at is the potential capacity of the
7 tailings containment area to -- to hold a certain
8 amount of volume in tailings and -- and whether -- and
9 ultimately to discharge would be depend on -- on the
10 volumes that are coming.

11 So if, you know, if you feel that there
12 isn't going to be a capacity issue, sort of, I guess I
13 just was wondering if you used, like, a wide range of
14 -- of volumes and flows and -- and if you guys are
15 very confident in those numbers.

16 MR. DAVID SWISHER: David Swisher with
17 Avalon. Yes, we're -- we're quite confident with the
18 numbers. And we derive those numbers through
19 statistical analysis and through actual fieldwork
20 that's generated both through the underground works
21 that are -- that have been done through Knight Piesold
22 to come up with the groundwater flows and the ranges
23 that we have from those flows to the detailed design
24 work that's done in the flotation plant; understanding
25 that typical flotation plant flows and the makeup

1 waters that are used in a typical flotation plant, to
2 the surface runoff flows and the precipitation.

3 We have the multiple years of data with
4 regards to the precipitation and the ranges in there.
5 So in terms of the confidence level, Avalon is very
6 confident with the -- the amount of flows that we have
7 included into -- into the DAR and into the -- the
8 process.

9 MR. KEVIN HAWTON: And I'll just add
10 something. The water balance modelling for the -- for
11 the tailings facility has been extensive. We ran
12 Monte Carlo simulations to do both the 5th and 95th
13 percentile over the twenty (20) year period.

14 So I hope that answers your question.
15 We've looked at a wide range of possibilities, and
16 plus we have those contingencies for various design
17 storms, et cetera.

18 THE FACILITATOR MERCREDI: And that
19 was Kevin Hawton for the record.

20 MR. MARC CASAS: Yeah, thanks for
21 those responses. It's Marc Casas from the Mackenzie
22 Valley Land and Water Board. I don't think I had too
23 many more, but I feel like -- oh, yeah, one (1) is:
24 Now, I understand that you've used a lot of
25 conservative numbers and that you -- that you guys,

1 you know, are confident that you will not exceed the
2 CCME guidelines that you guys are proposing.

3 But I was just wondering if you have --
4 what potential mitigation you guys have if that was to
5 occur. And that could be in terms of just pumping
6 back or not pumping out, those kinds of things.

7 Have you thought about potential
8 mitigation measures in the unlikely event of not
9 meeting the water quality objectives?

10 MR. DAVID SWISHER: David Swisher,
11 Avalon. Yeah, I think, you know, a good mitigation
12 plan is actually understanding the root causes of
13 these situations that occur versus, say, the -- the
14 typical monitoring stations that occur at, say, the
15 outflow of Drizzle Lake. By that time it -- it tends
16 to be too late.

17 From our standpoint in the design
18 aspect of the plant and what we're doing, I know in
19 some of the commitments we have we indicate, you know,
20 we're going to train our -- our operators with regards
21 to making sure the proper amounts of flotation
22 reagents and that sort of thing are -- are added into
23 the circuit.

24 But at the end of the day, in ta --
25 today's technology, we have a lot more confidence in

1 meeting those -- those goals and making sure that
2 we're not in exceedances, because everything is done
3 electronically now.

4 Even in the pilot programs that
5 Henrietta's been extensively involved in, everything
6 is done electronically, and you don't have a -- a
7 single person adding reagents in there like you used
8 to in the flotation plant. Our flotation plant's
9 going to be designed and set up very similarly.

10 So in terms of the confidence, I think
11 technology is allowing us to become more and more
12 confident as we improve our -- our design aspects of
13 the -- of the plant.

14 MR. MARC CASAS: Okay, thanks for
15 that. One (1) last question, and this is also just
16 more of a clarification, in terms of when you're
17 breaking down, sort of, the -- the way stream, you had
18 a thousand tonnes per day of paste going in your
19 underground.

20 Is there -- I'm guessing that won't
21 happen starting day 1. Is there a -- I'm assuming
22 that that means that for the first like maybe year or
23 so, or -- or however long it will be going, all of it
24 will go in -- in a for -- a slurry form to the TCA.

25 Is that correct?

1 MR. DAVID SWISHER: David Swisher,
2 with Avalon. That's correct. The first year really
3 is the -- the placeholder for all the tailings to
4 report to the tailings management facility while we
5 commission the paste plant. And, of course, we're --
6 operationally, we're looking at commissioning the
7 paste plant as soon as we can so that it coincides
8 with the completion of the first stope. And then we
9 can start backfilling and paste filling that first
10 stope that we mine out from underground.

11 So it will be within the first year
12 that we'll actually be transitioning paste fill
13 underground, which is a bit sooner than what we had
14 indicated originally in the DAR.

15 MR. MARC CASAS: Okay. Thanks a lot
16 for your questions. That's -- that's all I have.

17 MR. DAVID SWISHER: David Swisher
18 here. If you want to stay and ask more questions,
19 it'll maybe take away from Nathan getting up and
20 asking a lot more.

21 THE FACILITATOR MERCREDI: Nice try.
22 Okay. And, Nathan?

23 MR. NATHAN RICHEA: It's Nathan
24 Richea, with the Water Resources Division of
25 Aboriginal Affairs. I have only one (1) or two (2)

1 more questions. The first question I have is: In our
2 information request that we submitted, we asked about
3 some clarification on the source or, I guess, the --
4 the path, the flow path for water that leaves Thor
5 Lake, and there was a response.

6 I was just wondering if it's possible
7 to walk through that again today and whether you've
8 actually been able to be at the site and visually
9 confirm that the water from Thor Lake proceeds to
10 Great Slave and it doesn't go into the Long Lake and
11 Elbow Lake and all that stuff.

12 Can you just walk through the flow
13 path? And it'd be great if you have like a map. And
14 then you can sort of explain the concern that we had
15 in our information request.

16 MR. DAVID SWISHER: David Swisher,
17 with Avalon. Yeah, so, first of all, Nathan, I can
18 confirm that the outflow from Thor Lake runs initially
19 into Fred Lake, a small, little lake next to it, and
20 then through a series of marshes. It takes about 18
21 kilometres before it discharges into the Great Slave
22 Lake.

23 We've done extensive work. And I know
24 through the Stantec reports over the last three (3)
25 years of baseline, three (3) to four (4) years of

1 baseline, they've actually traced that out.

2 Knight Piesold, when they were doing
3 their initial review of the Thor Lake watershed once
4 Avalon, I think it was in 2010, did a very detailed 50
5 centimetre topographic survey of the area, that
6 allowed us as well to confirm the outflow and the
7 path.

8 Obviously the water's not going to flow
9 uphill, so it was very easy for us at that point to be
10 able to -- to confirm a lot of the areas. And, in
11 fact, Knight Piesold also confirmed an addition to the
12 Thor Lake watershed that we were not previously aware
13 of -- I think it was in 2010, in -- that added to the
14 Thor Lake watershed after we did that topographic
15 detail.

16 So that really helped solidify and
17 confirm. And so at this point, we can confirm that,
18 yes, that is correct. And I know we've got a map of
19 that somewhere. And, if necessary, we can pull it out
20 and provide it, if you'd like.

21 MR. KEVIN HAWTON: Yeah, I was -- I
22 remember when this request came in. And we -- we
23 thoroughly reviewed -- I -- I didn't personally walk
24 to this location, but we thoroughly reviewed that
25 mapping. Oh, it's Kevin Hawton, by the way. And, you

1 know, we're -- we're very confident that it's 5 metres
2 higher than it is at the outlet of -- of Thor Lake.

3 MR. NATHAN RICHEA: Thank you. It's
4 Nathan Richea, with the Water Resources Division.
5 That you for that clarification. There was just some
6 confusion, I think, in some of the earlier reports, so
7 thank you for clarifying.

8 The only other question I have is: Do
9 you know how many years -- I think there was some
10 discussion of this earlier -- rare earth elements and
11 how long they've been sampled I guess as background in
12 your receiving environment?

13 I think there was some confusion, at
14 least on my part. Has there been a year worth of rare
15 earth elements or has it been longer? Has sampling
16 occurred longer than the past year for background
17 concentration of rare earth elements? Thanks.

18 MR. RICHARD HOOS: Rick Hoos here. I
19 -- I will check the Stantec report; or, in fact, I can
20 check in the DAR again. But I seem to recall, from
21 what I read to you earlier, that that kind of sampling
22 has been done since about 2009.

23 But there has been more comprehensive
24 water quality, in particular, sampling done this --
25 this year in the last sampling effort. And that kind

1 of more comprehensive REE sampling for water quality
2 will continue as the water quality sampling program
3 continues.

4 MR. NATHAN RICHEA: Thank you. It's
5 Nathan Richea, with the Water Resources Division. So,
6 yeah, so I guess about three (3) -- three (3) years?
7 And you're going to continue to do the monitoring this
8 summer and in winter? Will that continue in the next
9 year, 2013, as well, or -- just wondering. Thanks.
10 Though more information is always great.

11 MR. DAVID SWISHER: David Swisher with
12 Avalon. I just want to note for the record that's two
13 (2) questions when he said it was only going to be one
14 (1).

15 So, yes, we've committed to continuing
16 the baseline work, you know, in terms of keeping up
17 the hydrology work. Mark Wiseman is in charge of
18 that. And -- and, you know, provided everything
19 aligns with regards to the project and -- and making
20 the progress in the project, we'd certainly continue
21 keeping that and monitoring initiatives moving forward
22 in the next year.

23 MR. NATHAN RICHEA: All right. Thank
24 you. It's Nathan Richea. I have no further questions
25 for today.

1 THE FACILITATOR MERCREDI: Thank you.
2 I'm looking to Ralph here and/or Anne. Are there any
3 further questions? We still -- we still have an hour
4 and a half of the session to go. So if there are any
5 questions, please speak now. Nathan Richea?

6 MR. NATHAN RICHA: I have more
7 questions, but it -- it's on other topics. Like, I
8 don't know if we want to wait until tomorrow. Like
9 closure, aquatic effects monitoring plan, that kind of
10 stuff.

11 THE FACILITATOR MERCREDI: Just one
12 (1) second.

13 MR. DAVID SWISHER: Paul? David
14 Swisher here just to, if I may, we -- we have some
15 presentations. So if there's more information that
16 we'd want to pre -- present, maybe prime the pump if
17 you will, we can do that tomorrow if -- if we want to
18 move on to a different subject.

19 THE FACILITATOR MERCREDI: Yeah, if --
20 I -- I think just, based on scheduling, like, there
21 may have been some who scheduled to be here or not be
22 here. So we wouldn't want to -- however, having said
23 that, I think if the Nechalacho water quality
24 discussion has come to its -- its natural end, then we
25 can maybe go to the hydrometall -- hydrometallurgical

1 plant, just because I -- I think it's reasonable to
2 assume that most of those -- most of those who would
3 be present for that discussion as well are here today.

4 So as far as moving forward with the
5 hydrometallurgical that's something that I would -- I
6 would put forward and -- and also put forward not only
7 to Avalon, but also to the parties that are here, if -
8 - if that would conclude the water quality discussion.

9 And Stephanie Poole has some questions.
10 Okay, and this is for just -- this is for water
11 quality? Okay, thank you.

12 MS. STEPHANIE POOLE: Thank you. My
13 name is Stephanie Poole, with the Akaitcho IMA office.
14 It's been the first day and -- and we've seen quite a
15 few presentations from the Proponent today. And --
16 and I've enjoyed listening to all of the -- the
17 questions and -- and the responses. So far, I just --
18 I have a few questions to ask before we move on, and
19 perhaps some comments.

20 Regarding the presentations in general
21 and the discussion around rare earth elements and
22 metals, what I noticed from your presentation is that
23 the focus is wholly on the lanthanide series. And no
24 mention is really made of the actinide series of
25 elements, while they do -- it's my understanding they

1 do come together, and that when you -- they're
2 exploited from the land, they're together. And then
3 they have to go through processing to sort of break
4 them apart and extract the elements that you -- that
5 you're looking after.

6 And I'm just wondering, for all of the
7 experts in the room and for the Review Board, like,
8 I'm hoping that -- that those other elements are not
9 being ignored in this review, because they do occur,
10 you know, in nature together and -- and that it is
11 possible that the actinide series of elements will --
12 will be in the effluent or tailings and will be left
13 on the land either at the Thor Lake site or Pine
14 Point.

15 So I just wanted to -- to mention them
16 since I hadn't really heard them been mentioned today.
17 But I think they -- that that is an issue and -- and
18 could be an impact and should be reviewed.

19 I have some questions regarding what
20 you refer to as the "tailings containment facility" or
21 the berm or the dam that goes around what is being
22 proposed. And during some of the questioning I had
23 thought that I had heard you say that the dam or the
24 facility will not be completely closed off, that some
25 water or effluent will be allowed to leak out from one

1 side of that area. I could be confused, but that was
2 just from the discussion earlier.

3 And then I'm wondering, in the DAR is
4 there any information provided -- well, I'm sure
5 there's information provided -- regarding rainfall,
6 snowfall, you know, seasonal weather events? And I
7 wonder for how long have you been collecting that data
8 or, if not you, maybe some other government agency or
9 former exploration group. You know, like how far back
10 does that data go?

11 I have questions regarding seismic
12 events, and -- and if you have any information on --
13 have you done any studies on seismic events for the
14 site and the zone of influence and also for the
15 region? My concern would be the possibility of earth
16 -- earthquakes that could breach the dam of the
17 tailings containment, and I wonder if you have
18 considered that or done any studies in that regard.

19 I have a bunch of questions regarding
20 the mine life, but I understand that, for this review,
21 you only want to assess and review a twenty (20) year
22 period. While the facts are stated that if this
23 proposal does go ahead, it will probably be for a lot
24 longer, and it seems like everybody's okay with just
25 saying, Well, we'll just review the first twenty (20)

1 years now and if it goes on longer, then we'll deal
2 with that later on.

3 But to me, that's -- that's not right.
4 That's not a good thing. You know, if this proposal
5 has the potential to be there for a hundred (100)
6 years, then it should be assessed as such. Yeah, so I
7 have a lot of questions about what happens if there's
8 a longer mine life.

9 For the paste fill plant and the
10 proposal of reducing your tailings above ground by
11 putting them underground, this is a proposal that
12 we've heard before in Akaitcho Territory, most
13 specifically with the De Beers Snap Lake Mine. And it
14 is my understanding that what they have proposed
15 didn't really work out that way and that they still
16 have yet to begin producing paste and putting it
17 underground. And so it makes me wonder how much
18 testing or studying have you done in regards to your
19 paste fill plant, about creating the paste and putting
20 it underground. You know, you're saying you think
21 that for a year you won't be able to do it, but what
22 happens if it's longer than that? Because that's
23 something that -- that is already happening in our
24 Akaitcho territory.

25 I'm wondering about information and

1 data on underground water and aquifers. Earlier I
2 heard Canada ask about how the water flows through the
3 lakes and into Great Slave Lake. And I wonder, you
4 know, like, when you're underground and -- do you have
5 any idea of underground watersheds in the aquifers
6 that may lead some of the contamination elsewhere.

7 You're basing a lot of your stuff on
8 CCME guidelines in regards to water quality
9 objectives. And for some of the things you're
10 proposing, because this is new with rare earth
11 elements, there -- there are no CCME guidelines for
12 some -- some of those elements.

13 And then so you've taken water quality
14 guidelines from Ontario. And I'm wondering why
15 Ontario. Is there other provinces in Canada or other
16 countries that have these guidelines? And I'm
17 wondering why you just decided to go with Ontario in
18 that regard.

19 Otherwise, I'll just -- those are all
20 my questions. And then my -- just my general comment
21 on -- on today is that it seems to me that a lot of
22 the data provided in the DAR was incorrect. It sounds
23 today like there was a lot of mistakes made and thing
24 -- a lot of different things had to be corrected.
25 And, in fact, there was even new information provided

1 only today to us.

2 So that just leads me to believe that
3 there may be serious problems with -- with your
4 modelling and your methods. And at this time, I have
5 no confidence in your methods in that regard.

6 So we'll just stop with that. And if
7 you need me to repeat or clarify any of my questions,
8 I'll be here to do that. Thank you.

9 MR. DAVID SWISHER: David Swisher,
10 with Avalon.

11 THE FACILITATOR MERCREDI: Yeah, I'll
12 just -- just one (1) second. Thank you, Stephanie.
13 There's several in there, so I'll turn the mic over to
14 David. And hopefully he's kept track of most of
15 those. David...?

16 MR. DAVID SWISHER: I wasn't sure if
17 you were ever going to end, Stephanie. So David
18 Swisher with Avalon. Thanks for your questions. So
19 I'll -- I'll go through them. And as I'm answering,
20 if I don't answer your question, I'd ask you to just
21 clarify with me, please.

22 With regards to the actinide series,
23 that's not part of the -- the project. We're only
24 interested in the lanthanide series, and the actinide
25 series are not in any appreciable quantities to even

1 be considered. So that -- that's why it was never
2 discussed with regards to the actinide series.

3 To the tailings management facility, I
4 think it was just with regards to the discussion on
5 how the waters would transfer from the polishing pond
6 and the TMF to the Drizzle Lake facility which may
7 have been confusing. So to clarify, the -- the
8 tailings management facility will be enclosed
9 completely, and there won't be any open area on either
10 side of the tailings management facility.

11 With regards to the weather data that
12 was produ -- produced in the DAR, we've actually,
13 since 2007, when the first drilling campaign started
14 up, Nechalacho -- or Chalacho (phonetic), sorry, it
15 was basically -- weather data was starting to be
16 gathered and recorded by Avalon.

17 So we've been gathering weather data
18 since 2007 internally. We've also utilized the
19 extensive weather data that's been gathered throughout
20 Yellowknife, Hay River, Lutsel K'e, Fort Resolution, I
21 believe, and those communities to compare with the
22 localized weather data as well. So that includes all
23 the snowfall, the precipitation, the winds.

24 We've also had a wind test tower out at
25 the site testing the winds for potential opportunities

1 in the future for wind energy. And we've been doing
2 that, I think, for the last three (3) years with the
3 wind test tower. So there's a lot of initiatives
4 there to gather as much information locally that went
5 into the -- to the DAR.

6 The seismic information, there is
7 extensive seismic information here in the Northwest
8 Territories although it's not a -- a hotspot for
9 seismicity, but it is -- it has to be incorporated
10 into all the design work that we do.

11 So for -- I know Kevin can speak
12 extensively about that in the design work that Knight
13 Piesold does for us for the tailings management fac --
14 facility. All of that data has to be incorporated in
15 there, and then factors of safety are added to that in
16 the design, and so that is accounted for, seismicity.

17 With regards to the project review --

18 MS. STEPHANIE POOLE: Stephanie Poole,
19 Akaitcho IMA. I wonder if -- is the seismic data
20 located in the DAR and -- and where?

21 MR. DAVID SWISHER: David Swisher,
22 Avalon. Yes, it is located in the DAR, and I'll
23 provide you the -- excuse me, the page or section here
24 in just a moment.

25 David Swisher with Avalon. While

1 Rick's looking for the location of the seismicity
2 data, are you okay with me moving alo -- answering
3 your other question, Stephanie? Okay. So moving on
4 then, and I'll come back to that, with regards to the
5 twenty (20) year project review, basically from a
6 project standpoint -- our project's a bit unique
7 because most projects are -- very minimal projects
8 extend beyond twenty (20) years.

9 For us the cutoff is twenty (20) years,
10 predominately because it has to do with the financing
11 efforts and the cashflow model. Nobody looks at
12 cashflow models that extend beyond twenty (20) years.

13 So we cut it off at twenty (20) years.
14 I think the important point with regards to this
15 review is whether it's twenty (20) years or whether it
16 goes beyond that. We don't know at this point.

17 We're looking at twenty (20) years, but
18 the important point is that the review -- the -- the
19 components of the project don't change, and it is
20 subject to additional renewals within the land use
21 permit and the water licence.

22 And those are the times that I believe
23 every five (5) years we have to review, yeah,
24 depending on what Mark sets us up for there. But it
25 depends on any changes at that point come to light and

1 a -- and a review is done to determine if there are
2 any changes outside of the scope that was initially
3 contemplated.

4 And so there -- there are processes
5 here in the NWT to account for -- for that should it
6 go beyond, say, the timeframe in which it originally
7 had anticipated. For us, the twenty (20) year review
8 is a -- is a number that's consistent with industry
9 standard and as well as with the -- the financial
10 institution.

11 So it's important for us to be
12 consistent because at the end of the day, you know,
13 this project has to be financed and -- and financable
14 (sic). So that's why we took it out to twenty (20)
15 years.

16 And -- and it's a positive. It should
17 be noted as a positive because most deposits are not
18 that long lasting. And so if we can build
19 sustainability in the NWT, then that -- that should be
20 viewed as a positive I would think, or hope anyway.

21 The seismicity data, just going back,
22 is on page 463 of the DAR, section 4(4.4).

23 MR. RICHARD HOOS: Rick Hoos here.
24 Just to elaborate, and I think Dave kind of alluded to
25 it as well, the opening sentence kind of says a lot.

1 This particular region of the Northwest Territories
2 where the Thor Lake property is located is considered
3 a historically quiet earthquake zone.

4 It then goes on to talk about a seismic
5 hazard assessment that was conducted using design
6 tables from the National Building Code of Canada. It
7 talks also about the fact that for the tailings
8 management facility, a consequence classification
9 following the Canadian Dam Associations 2007 Dam
10 Safety Guidelines was employed in order to determine
11 what level of -- what the level of design should be to
12 protect against the -- the maximum possible ground
13 motion event that could occur there in a thousand
14 (1,000) year event.

15 And that was all described in work done
16 by Knight Piesold and presented in the DAR as a -- as
17 an appendix document. It's a lot of detail, sorry
18 about that. But for sure seismicity was well
19 considered in the design of the project, both at
20 Nechalacho and at the hydro-metallurgical site --
21 plant site.

22 MS. STEPHANIE POOLE: Stephanie Poole,
23 Akaitcho IMA. You mentioned an appendix with more
24 detail. What appendix is that?

25 THE FACILITATOR MERCREDI: It's in the

1 appendices of the DAR. And it doesn't say which
2 appendix. Rick will have to look at that while we're
3 -- we're all moving forward.

4 MR. RICHARD HOOS: I believe it's in
5 appendix -- I'm sorry. Rock Hoos here. I believe
6 it's in Appendix C of the DAR, which is an appendix
7 document that contains all of the Knight Piesold
8 reports that are included in and considered in the DAR
9 itself.

10 But we will check that for you and get
11 you the specific reference. And if you like, we can
12 get you a copy of that particular paper.

13 MR. KEVIN HAWTON: Kevin Hawton here.
14 It's our memo NB09-00468. Kevin Hawton here. The --
15 the memo number located in the appendix of the DAR is
16 NB09-00468. And that's the one (1) that addresses the
17 Thor Lake site.

18 MR. DAVID SWISHER: Okay. David
19 Swisher here with Avalon. Thanks, Kevin. Great, so
20 hopefully that answers your question on the
21 seismicity, Stephanie. I think you had a few more
22 questions here. I'll -- I'll just run through them.

23 With regards to the paste plant test
24 work, we've done extensive test work. We, in fact,
25 conducted and completed a pre-feasibility through

1 Golder and Associates. That was over a year ago. And
2 that went through extensive test work on utilizing
3 actual tailings, mixing it with different binders and
4 slags to determine what the -- the optimal paste fill
5 would be, also accounting for all the pump capacities
6 and parameters.

7 Once that pre-feasibility was done, we
8 invoked a feasibility study with Golder, who is
9 completing the -- the feasibility back work and
10 basically confirming all of that test work that will
11 be incorporated into our definitive feasibility study.

12 So we're -- we're very confident in
13 that work that's been done, and the -- the ability to
14 optimize the amount of tailings that reports
15 underground as a paste fill.

16 Also with regards to the underground
17 aquifers, I think you asked about that in terms of
18 distribution. Oh, excuse me.

19 MS. STEPHANIE POOLE: Stephanie Poole,
20 Akaitcho IMA. So just to clarify regarding the paste
21 fill feasibility study that Golder and Associates is
22 doing on your behalf, that's not completed?

23 MR. DAVID SWISHER: David Swisher with
24 Avalon. The feasibility work is in draft form
25 currently. It is completed, but it's in draft form,

1 and it's not been finalized as of yet because I'm in
2 technical sessions and I haven't had a chance to
3 review it because we just got it last week.

4 THE FACILITATOR MERCREDI: Just to
5 clarify, there -- Avalon has a pre-feasibility study.
6 And this is the feasibility study that is in draft
7 form, just for clarification?

8 MR. DAVID SWISHER: David Swisher with
9 Avalon. The feasibility on the paste fill plant, yes.

10 THE FACILITATOR MERCREDI: Thank you.

11 MS. STEPHANIE POOLE: It's Stephanie
12 Poole, Akaitcho IMA. I'm wondering if we can get a
13 date on when that feasibility study will be released
14 to the public registry?

15 THE FACILITATOR MERCREDI: And we'll
16 just have -- let Avalon caucus here for a moment.

17

18 (BRIEF PAUSE)

19

20 MR. DAVID SWISHER: Sorry, Stephanie,
21 could you repeat that for me, please? David Swisher,
22 Avalon.

23 MS. STEPHANIE POOLE: Stephanie Poole,
24 Akaitcho IMA office. It was just a followup question
25 in regards to your feasibility study that's in draft

1 form. When will it be ready to be released to the
2 public registry, like a date?

3 MR. DAVID SWISHER: David Swisher with
4 Avalon. It won't be released to the public registry,
5 as this document is an internal document for use for
6 our feasibility study and has confidential information
7 regarding competitive information on pricing and that
8 sort of thing.

9 With regards to some of the technical
10 aspects, you know, if it's -- if it's relevant, we
11 could provide that information. But at the end of the
12 day, I think what we've committed to with regards to
13 paste fill should stand for the review process.

14 MS. STEPHANIE POOLE: Stephanie Poole,
15 Akaitcho IMA Office. The technical aspects of the
16 feasibility study are a concern to the Akaitcho Dene
17 First Nations, and I would like to have them onto the
18 Public Registry. Thank you.

19 THE FACILITATOR MERCREDI: If I might.
20 For the Review Board to consider that information --
21 and every party has every right to ask evidence to be
22 submitted to the Public Registry or considered by the
23 Board; however, when it comes to confidential
24 information, that is -- there are some difficulties
25 there.

1 As -- as far as -- there's evidence,
2 though, that the -- there -- that the Review Board can
3 consider in confidence, but will -- would not be
4 available for any viewing by any other parties.

5 So the -- the Review Board would have
6 to consider that evidence in confidence. It would be
7 on the public -- what's called the public record, but
8 it would not be on the Public Registry.

9 So if that's what you're asking -- and
10 again, that is subject to the company's willingness to
11 do that because, again, this is getting into
12 information that the company has -- has indicated is
13 confidential.

14 So just -- just to kind of put that
15 discussion in context, it would be the Review Board
16 looking at that in confidence and not available to the
17 -- to the public. So I -- I just wanted to put that
18 in.

19 MR. DAVID SWISHER: David Swisher with
20 Avalon. If I could just -- maybe I can help clarify
21 some things. I -- it's probably not valid to compare
22 directly with the diamond mines because when you're
23 looking at a kimberlite pipe deposit and the -- the
24 ground conditions there, it's -- it's vastly different
25 than what Nechalacho is composed of.

1 And having just recently spoke with the
2 president of that particular operation and about that
3 paste fill project that Don just reminded me of just a
4 couple weeks ago, in fact, yes, they are selling their
5 paste fill plant.

6 It was very clear that they had issues
7 based on the kimberlite deposit and the fact that the
8 constitutes in the minerals of that were not conducive
9 for a paste fill, whereas with our deposit, it's --
10 it's completely -- you -- you can't compare apples to
11 apples, which is why when we went through the
12 analysis, we -- we went through the analysis with
13 Golder, who are very well known for their paste vant -
14 - plant technology.

15 In fact, there's Golder, and there's
16 also AMEC, AMEC out of Australia. And that's why
17 we've worked with Golder on the paste fill plant
18 technology for that. So I -- you know, hopefully -- I
19 just wanted to -- to comment on -- on that comparison
20 as well.

21 And as Paul said, if there's
22 information that, you know, that is not -- maybe not
23 on the public registry but will go on with the Review
24 Board as a -- as a clarification point, then certainly
25 Avalon would -- would be willing to -- to share that

1 in that capacity.

2 MR. RALPH GRISMALA: Ralph -- Ralph --
3 Ralph Grismala, ICF Marbek. There was a request from
4 the Review Board, number 37, that discussed the issue
5 of the -- the long-term impacts of the paste backfill
6 on the -- on the groundwater interactions.

7 And in Avalon's response, there are a
8 number of assertions on the engineering properties of
9 that backfill, but there's no backup for those
10 assertions. Presumably in the Golder report, or some
11 other source, you have that type of information, and I
12 think that's what Stephanie's asking for. And I think
13 I would also be interested in seeing that.

14 MR. DAVID SWISHER: Yeah, if you're
15 referring to the rheology data and the test work that
16 went into it, you know, we could certainly pull that
17 data out specifically.

18 MR. RALPH GRISMALA: Ralph Grismala,
19 ICF Marbek. Yes, I think I would be interested in the
20 -- you know, the engineering properties, the water
21 contents, leaching potential, you know, anything to do
22 with the chemistry of the material, you know, that
23 type of information.

24 THE FACILITATOR MERCREDI: And my
25 question, Ralph, is with that information, would it

1 speak to the feasibility of producing a feasible paste
2 backfill for -- for this project?

3 MR. RALPH GRISMALA: Ralph Grismala,
4 ICF Marbek. I think the interest is less in whether
5 it's feasible for the product -- for the project in
6 terms of, you know, filling up the underground space,
7 but more so into being comfortable that the -- that
8 there won't be for -- fluid from that paste backfill
9 which is going to negatively impact the groundwater in
10 the area.

11 THE FACILITATOR MERCREDI: Okay. And
12 my next question is to Stephanie then. Does any of
13 that exchange address any of your concerns in any way?

14 MS. STEPHANIE POOLE: Stephanie Poole,
15 Akaitcho IMA office. I'm not asking for any
16 confidential information to be put onto the public
17 registry. If the Review Board wanted that
18 information, I'm sure they could request it
19 themselves.

20 The proponent mentioned that from that
21 confidential document that they would be able to pull
22 some technical aspects to provide to the public
23 registry that were not confidential. And -- and that
24 is what I was asking for.

25 And regarding what Mr. Grismala had

1 said, I support that as well. Like, I would like --
2 the -- the more information that we can have to
3 review, the better.

4 THE FACILITATOR MERCREDI: And just to
5 capture that conversation, it sounded like that was
6 not information that was in that report. It sounded
7 like that was in response to a previous information
8 request, just -- just to -- so we can keep track of --
9 of where that information is coming from because --
10 just so we -- we're all on the same page.

11 MS. STEPHANIE POOLE: Stephanie Poole,
12 Akaitcho IMA office. I believe the -- one (1) is a
13 new report with the technical aspects of the
14 feasibility study that is still in draft, and the
15 other is further information, outstanding information,
16 from an information request made by the Review Board
17 that should be delivered on, I believe. It's two (2)
18 different things.

19 And before I let go of the microphone,
20 I just wanted to say the proponent's comment about
21 this project not being the same as a diamond mine, I
22 understand that. But what also should be understood
23 is that this project is -- is new. It's never been
24 done before in the north, in Akaitcho territory in
25 Canada.

1 And therefore, to me it makes common
2 sense that, you know, the highest level of review and
3 precaution should be applied because it's something
4 totally new that we're dealing with, and there's a lot
5 of unknowns.

6 And, you know, we've learned. We have
7 experience from dealing with other explo --
8 exploitation projects in our territory. And -- and we
9 have to bring that knowledge forward as well when
10 we're reviewing new projects such as this.

11 MR. DAVID SWISHER: David Swisher with
12 Avalon. Yeah, thank you for that, Stephanie. And I
13 certainly understand the concerns there. With regards
14 to the paste fill plant, I -- I guess I would need
15 some -- some clarification with regard -- excuse me.
16 In terms of what concern there would be.

17 Obviously, from a proponent's end and
18 Avalon's end, and not to make light of what Ralph is
19 asking for there, but it's our -- in our best interest
20 to make sure that the paste fill is set up properly
21 and competent. We certainly are not going to be
22 taking shortcuts there because it would -- could
23 potentially shut down the mine.

24 That's a critical component of our --
25 our process for underground. Not only that, it should

1 be viewed positively because we're -- we're able to
2 utilize the majority of that fill for underground
3 versus -- and minimize the amount that's going to the
4 surface tailings management facility.

5 So from Avalon's standpoint, we see it
6 as a positive. From a design standpoint, it is only
7 in our best interest to make sure we're managing to
8 the safest standards possible when using the paste
9 fill and making sure the designs -- and we go to the -
10 - to the experts in that field, which we've done
11 through Golder. Thanks.

12 MR. RALPH GRISMALA: Ralph Grismala,
13 ICF Marbek. David, I -- I thank you for those
14 comments, and I agree. And that's why when I spoke
15 last time I prefaced it by saying I wasn't that
16 interested with -- that interested with how the paste
17 sets up because, frankly, if it doesn't, that's going
18 to be your problem.

19 The issue that is of potential concern
20 is that roughly 60 percent of the tailings material is
21 going to be going back into the mines. We have a huge
22 underground tailings impoundment there and we want to
23 make sure that we understand how that behaves. And
24 that tailings paste is a mixture of solids and liquid,
25 and we just want to have more higher degree of

1 confidence of where that liquid goes and what the
2 characteristics of that liquid is.

3 MR. DAVID SWISHER: David Swisher with
4 Avalon. Perhaps, since we have a final form in our
5 pre-feasibility which also set the basis for the paste
6 fill design criteria, I think that would probably --
7 there are components within the pre-feasibility that
8 are in final form that -- that I would feel
9 comfortable providing at this point considering we
10 have not finalized our document for the feasibility
11 portion.

12 Because everything that was done for
13 pre-feas is the stage then taking it into feasibility.
14 So with regards to providing information, perhaps we
15 have some homework this week that I could provide this
16 week; additional information that goes into the design
17 criteria and some of the test work to -- that would,
18 hopefully, answer Ralph's questions.

19 MR. RALPH GRISMALA: Ralph Grismala,
20 ICF Marbek. I think that would definitely be a step
21 forward with the caveat that if anything changes
22 further down the line in the feasible study, that the
23 Review Board would be notified of that also.

24 THE FACILITATOR MERCREDI: And while
25 Simon is capturing the wording, did you have anything

1 on that, Nathan?

2 MR. NATHAN RICHEA: Thank you. It's
3 Nathan Richea with the Water Resources Division. I'm
4 just listening to the conversation, and I guess, to
5 me, it's not clear if there's an outstanding
6 Information Request that went to the proponent from
7 the Board regarding leaching from paste backfill.

8 I think I heard that, and I'm just
9 wondering if that could be confirmed. Thanks.

10 MR. RALPH GRISMALA: Ralph Grismala,
11 ICF Marbek. I will base this response on my best
12 understanding of the process here.

13 There was an Information Request.
14 Avalon did respond to the Request, and I think that
15 the -- whatever residual questions remain, we thought
16 it could be handled in this technical session and did
17 not issue a subsequent Information Request. Is that
18 accurate?

19 THE FACILITATOR MERCREDI: I would say
20 that's accurate, and Nathan and then Marc, yeah.

21 MR. NATHAN RICHEA: Thank you. It's
22 Nathan Richea with the Water Resources Division. Yes,
23 we would be interested as well in any information
24 related to interactions with underground water and the
25 paste backfill.

1 Our experience has shown there
2 potentially could be an issue with leaching of metals
3 and other contaminants of potential concern in the
4 underground.

5 So, yeah, we'd be interested in that
6 information as well, thanks.

7 THE FACILITATOR MERCREDI: Thank you.
8 And Marc...?

9 MR. MARC CASAS: Marc Casas from the
10 Mackenzie Valley Land and Water Board. While I can
11 understand David's assertion that this project is --
12 is different than the diamond mines and I -- it
13 obviously is.

14 There have definitely been issues with
15 -- with paste production in the NWT, so I think that's
16 where some of the concerns are raised, and I'm
17 wondering if maybe there can be some reassurance or
18 some type of mitigation that in the event that, say,
19 you're planning to be able to have it ready in a year,
20 and that wasn't -- you weren't able to reach that for
21 whatever reason, what -- what are the potential
22 mitigations?

23 Like, how much more -- like, is it --
24 you know, could you just continue to fill the
25 containment area with more slurry or those types of

1 things? What kind of mitigation measures do you have
2 to reassure people that you can address that?

3 MR. DAVID SWISHER: David Swisher with
4 Avalon. See, this is precisely why we don't like to
5 talk about all these optimization efforts. It just
6 adds more questions.

7 No, at the end of the day, the -- in
8 the DAR originally, the tailings management facility
9 was bigger, the -- the berms were higher to
10 accommodate a much higher flow of tailings. And so by
11 being able to optimize the paste fill plant or by --
12 not us, but Golder, optimizing the paste fill plant to
13 where we can put more tailings underground because of
14 the mixtures, it -- it only improves the footprint for
15 the tailings management facility in which we described
16 earlier and being able to tighten that up.

17 You know, from a mitigation standpoint,
18 if we need more room as indicated during the
19 presentation, there is always opportunity to -- to --
20 to raise up the -- the berms to expand that. However,
21 Avalon doesn't believe or predict at all that we will
22 -- we will need to do that because of the tests --
23 test work that Golder has done and their -- their
24 backing that their professionals have provided with
25 regards to the competency of this fill as fill for us

1 in our process.

2 Keep in mind that the paste fill is an
3 integral part of our mining process, which is also why
4 it's -- it's probably more important for Avalon to
5 make sure this paste fill plant works than it is for
6 anybody else in this room. Thank you.

7 THE FACILITATOR MERCREDI: Nathan...?

8 MR. NATHAN RICHEA: Thank you. It's
9 just Nathan Richea. I think something that might help
10 the process, in the past, in other EAs we have sort of
11 a commitments table. I'm not sure if there's one (1)
12 for this one (1) yet.

13 But the issue may be headed off by a
14 commitment from the company to use -- to put paste
15 backfill underground, and therefore we won't have to
16 have a contingency in the event that paste doesn't go
17 underground or something like that.

18 And then pending the results of some
19 testing on how the paste backfill may interact with
20 the groundwater, we can make judgments and provide the
21 Board with evidence in our technical report on whether
22 it will change the quality of water or effluent as far
23 as the impact protections. Thanks.

24 THE FACILITATOR MERCREDI: Okay, it
25 sounded like there might have been a request for a

1 commitments table and then another commitment. So
2 before we explore that, I'd like to go back to if --
3 if it -- if we can still capture what Simon was trying
4 to capture there. And so with that, Simon, go ahead.

5 MR. SIMON TOOGOOD: Thank you. It's
6 Simon with the Review Board. I'm supposed to be
7 looking at Avalon here for some clarification on what
8 you will actually be able to provide with respect to
9 the -- I believe you mentioned you'd provide
10 additional information on design work and the criteria
11 of the paste backfill. If somebody could clarify what
12 information you would be able to provide.

13 UNIDENTIFIED SPEAKER: We'll -- we'll
14 provide the design criteria and the results of the
15 test work.

16 MR. SIMON TOOGOOD: Okay, thank you.

17 MR. RALPH GRISMALA: Ralph Grismala,
18 ICF Marbek. I'm just going to read what we had in our
19 notes here when we were discussing original
20 Information Requests and things like that. And these
21 may not be the -- and probably wasn't the wording that
22 was final, but it'll give you a better idea of what we
23 were looking for at the time, and:

24 "Please present the chemical
25 characteristics of the paste

1 backfill, and based on the results,
2 present a discussion of the chemical
3 interactions that are predicted to
4 occur between the paste backfill and
5 the existing groundwater. The
6 analysis should present support for
7 statements regarding the short term
8 and long term interactions and the
9 effects on water quality. Please
10 provide complete information on the
11 composition, chemistry, and
12 engineering properties of the paste
13 backfill."

14 Does that help?

15 MR. DAVID SWISHER: David Swisher with
16 Avalon. It -- it does to a certain degree, but I
17 would remind the Board, and I remind everybody in
18 here, that at the end of the day, the paste fill and
19 the water as a result of the paste fill that comes off
20 of that, because again, mind you the paste fill is a
21 cemented fill. It is a cemented paste fill that
22 solidifies underground and acts as supporting agent
23 underground.

24 And the water, as we've already stated
25 in our discussions with regards to Nechalacho water,

1 reports to the tailings management facility. And as a
2 result, we've already said that we are proposing the
3 SSWQOs from that.

4 So we are creating this system and the
5 water balance including the underground. So I would
6 please ask everybody to remember that when trying to
7 now analyse the underground environment, when actually
8 the underground environment is already included in the
9 discussions that we've -- we've had previously.

10 THE FACILITATOR MERCREDI: Go ahead,
11 Nathan.

12 MR. NATHAN RICHEA: Thank you. It's
13 Nathan Richea. Thank you for the clarification,
14 David. Yeah, and we're just trying to assure that we
15 don't run into a problem where, for some reason,
16 something is missed or overseen, the predictions are
17 worst case scenarios and we end up not meeting our
18 objectives in the receiving environment. That's what
19 we're trying to avoid, right?

20 So that's probably why all of this
21 concern, at least the concern that I think I'm
22 bringing to the table, is trying to understand what
23 the interactions will be and whether that will change
24 potential water quality going into the receiving
25 environment. We definitely don't want to set site

1 specific water quality objectives that you can't
2 achieve. There's no point in doing that.

3 But we also want to make sure that the
4 objectives that we do set are also protecting the
5 downstream environment, right? So we're just trying
6 to balance and making sure that we're not going to get
7 taken off guard by another source that we didn't
8 account for, right? So thanks.

9 THE FACILITATOR MERCREDI: And just
10 one (1) moment.

11

12 (BRIEF PAUSE)

13

14 THE FACILITATOR MERCREDI: So we will
15 -- regarding the homework, actually what we'll do that
16 for particular -- on that issue is we'll revisit that
17 tomorrow morning. And there will be some further
18 discussion, I would expect. So I'm just basically
19 saying to Avalon expect there might be some further
20 discussion on that.

21 Ralph does have a separate question, I
22 believe.

23 MR. RALPH GRISMALA: Ralph Grismala,
24 ICF Marbek. And this was triggered in part by -- by
25 something you had said a few moments ago, that the --

1 the liquid from the paste backfill would be returning
2 to the tailings maname -- management facility. And
3 earlier, somebody had mentioned that water pumped out
4 of the mine would be going to the TMF.

5 And my question was: Does the -- the
6 analysis of the concentrations in the output from the
7 TMF consider those inflows in the chemical composition
8 in volumes of those inflows?

9 MR. DAVID SWISHER: The analysis
10 considers a worst-case scenario because the -- the
11 water that is underground in the underground sump
12 that's collected, all that water sits underground, so
13 it's not a continuous flow out. So any suspended
14 solids settle out underground so that we can dispose
15 of the sludge underground and mined out workings.

16 And there is a higher ratio of
17 freshwater that's added to the underground workings
18 from the function of underground mining through
19 drilling fluids, through washing the muck piles after
20 the shot. So there is an abundance of freshwater,
21 more so that's added to the underground, than there is
22 any drainage that would come off of the paste fill.

23 And so in terms of being included in
24 the modelling, it was not because it was considered
25 that it would dilute it even further. So we wanted to

1 look at the modelling criteria as -- as more of a
2 worst case scenario in terms of what we did model, so
3 we did not include that as a diluted measure. We can
4 go back and include it as a diluted measure, it'll
5 just lower the figures.

6 MR. RALPH GRISMALA: Ralph Grismala,
7 ICF Marbek. Thank you for your response.

8 THE FACILITATOR MERCREDI: Okay, and
9 in all this discussion, David...

10 MR. DAVID SWISHER: Yeah, Dave Swisher
11 with Avalon. I still have to answer the rest of
12 Stephanie Poole's questions.

13 THE FACILITATOR MERCREDI: I was -- I
14 was just trying to see if there's some -- some more
15 that Stephanie -- so, yeah, there were some unanswered
16 questions, I believe, so we'll continue along that
17 line -- Stephanie's line of questioning.

18 MR. DAVID SWISHER: Okay, great. So
19 moving on with Stephanie's questions. The had to go -
20 - her -- I think where we left off was the underground
21 aquifer in the area. It's not so much an aquifer.
22 But maybe -- I know that Knight Piesold did some work
23 for us there, and so maybe Kevin can clarify with
24 regards to the test work we have done and in -- in the
25 -- both the surficial and the -- and the groundwater

1 regime.

2 Kevin...?

3 MR. KEVIN HAWTON: Kevin Hawton, with
4 Knight Piesold. So I think your question was just
5 related to the groundwater inflows. I -- I didn't get
6 quite what the question was.

7 MS. STEPHANIE POOLE: Stephanie Poole,
8 Akaitcho IMA office. I'm just wondering what is the
9 proponent's understanding or what studies or
10 information do they have to provide on any aquifers or
11 underground water that is occurring onsite at Thor
12 Lake or within the zone of influence. Thank you.

13 MR. KEVIN HAWTON: Okay, yeah. Kevin
14 Hawton, Knight Piesold. Yeah, we've done extensive
15 geotechnical and geomechanical drilling at the site.
16 The geomechanical drilling included, I believe, seven
17 (7) deep drill holes around the -- around the mine
18 area. That included doing packer testing, which
19 measures permeability.

20 We've also reviewed the majority of the
21 Avalon core and logs to verify if there was any
22 distinctive features that may be water bearing. And
23 to date, we've -- we haven't encountered anything.

24 We've also done shallow geotechnical
25 drilling into the bedrock and done packer testing, and

1 the bedrock is generally tight.

2 MR. DAVID SWISHER: David Swisher with
3 Avalon. Thanks, Kevin. So moving on, Stephanie, you
4 asked about the CCME SSWQOs that we -- we had and why
5 we're using Ontario as a basis for CCME or -- or for
6 our SSWQOs. And it had to do with one (1) of the
7 constituents in the table that we had, vanadium.

8 Vanadium is not a -- I don't believe
9 it's governed under CCME, so we utilized the Ontario
10 water quality guidelines because that's the guidelines
11 we were able to find, I believe, at the -- at the
12 time. So we used those standards just for that one
13 (1) component, which was vanadium.

14 MS. STEPHANIE POOLE: Stephanie Poole,
15 Akaitcho IMA Office. So are you saying that in
16 regards to vanadium, that Ontario is the only
17 jurisdiction on the planet that has water quality
18 guidelines?

19 MR. RICHARD HOOS: Rick Hoos here.
20 No, that's not to suggest that there aren't other
21 authorities that also have, let's say, a guideline
22 value for vanadium. But the Ontario numbers were used
23 because they seemed to -- they were available, and
24 they were particularly relevant since a lot of Ontario
25 is Canadian shield country as well.

1 And so it was deemed to be appropriate
2 for this situation. We have on -- on occasion also
3 looked at water quality criteria in British Columbia,
4 for instance, for other purposes, but for vanadium,
5 this one (1) seemed to be the most useful one (1) to
6 refer to.

7 MR. DAVID SWISHER: David Swisher with
8 Avalon. I'll continue on with Stephanie's questions
9 here, we're getting close. Stephanie, you mentioned
10 your confidence level in the DAR, and certainly I can
11 understand where you would get that -- or perceive
12 that with the discussions that we've had with some of
13 the information that's been presented.

14 I -- I would just like to point out
15 that the DAR was developed back in March of 2010, so
16 we're well over two (2) years, almost two and a half
17 (2 1/2) years since the development of the DAR.

18 I'd say we've been pretty -- pretty
19 good to get pretty close to where we're at today with
20 regards to the DAR, but there's always optimization
21 efforts. And so those optimization efforts that the
22 company continues to work on in its processing
23 facilities or even in -- in any of the other items
24 that we identified in our -- in our, I guess,
25 supplemental information requested by the Review

1 Board, identified those -- those optimizations and
2 updates.

3 And so, you know, certainly the
4 information in the DAR is still of very good quality,
5 and the supplemental in -- response that we provided
6 to the Review Board is -- is a -- is an additional add
7 on to that in terms of just some of the optimization
8 efforts that we've been undergoing.

9 I -- I think it's really important for
10 developers in any situation where they're going
11 through a longer process to be able to have the
12 opportunity to optimize the processes, particularly in
13 the way of where the environment and any water quality
14 is concerned.

15 And -- and certainly Avalon with its
16 commitments will continue doing that along the way.
17 And I believe -- I believe that was the last one (1)
18 you -- you had, so thank you.

19 THE FACILITATOR MERCREDI: And,
20 Stephanie, do you have any further questions or
21 followup comments?

22 MS. STEPHANIE POOLE: I have a
23 followup question regarding the -- the use of the
24 Ontario -- Ontario water quality objectives for
25 vanadium. I'm wondering, are those the guidelines

1 that the -- Canada and the Land and Water Board will
2 be using as well, or will other jurisdictions be
3 considered?

4 I'm wondering -- well, I'm assuming
5 that every project is assessed independently, and the
6 CCME guidelines are not always just the end all be
7 all, right. It depends on -- on what it is that's
8 being proposed. And I'm wondering how Canada and the
9 Land and Water Board will be determining the water
10 quality objective for vanadium.

11 THE FACILITATOR MERCREDI: The Review
12 Board has req -- just to kind of -- what Avalon has
13 proposed for site specific water quality objectives
14 are that, a proposal. And the Board has asked -- the
15 Board did request that -- that Avalon put -- put those
16 forward in addition to rationale for why they are
17 acceptable.

18 And so for -- for example, for
19 vanadium, that is the developer's proposed water
20 quality objective for vanadium, and they have chosen
21 the rationale of -- correct me if I'm wrong, but
22 according the same rationale that Ontario has had. So
23 that's the one that they've adopted and proposed. I
24 see them nodding in -- in agreement with that.

25 So, again, that's a proposal. If -- if

1 there is disagreement within this process -- within
2 the environmental assessment process -- with the --
3 with the number that's been proposed or the rationale,
4 this is the forum to -- to express that disagreement
5 and also to inform the Review Board to -- to inform
6 the Review Board why it might be -- not be protective
7 or why it may lead to a significant adverse impact on
8 the environment, should that be adopted.

9 So, again, that -- that is what we are
10 here for today. The numbers that the Company has put
11 forward is -- is a proposal. It is evidence that the
12 Company has produced for the review Board to consider,
13 and it is -- and as -- as I've mentioned, it is here
14 for -- for public examination. So, I hope -- does
15 that answer your question?

16 MS. STEPHANIE POOLE: It's Stephanie
17 Poole, Akaitcho IMA Office. I believe my question was
18 directed to Water Resources Canada and the Mackenzie
19 Valley Land and Water Board. Thank you.

20 THE FACILITATOR MERCREDI: For sure.
21 You guys can paper-rock-scissors for who answers first
22 on that.

23 MR. NATHAN RICHEA: Thank you,
24 Stephanie. It's Nathan Richea with the Water
25 Resources Division, Aboriginal Affairs.

1 As you heard today, we're looking at a
2 process for reviewing Avalon's proposed site-specific
3 water quality objectives. We want to continue to work
4 with them to help improve, I guess, some of the
5 objectives.

6 Part of that will include looking at
7 what the background concentration of parameters are in
8 the receiving environment, which includes the -- I
9 don't even know -- vanadium, in the -- in the
10 receiving environment, particularly Drizzle Lake for -
11 - for site-specific water quality objectives and
12 beyond.

13 So that's one (1) important
14 consideration when we look at any parameter of
15 concern. What is the existing condition in the site-
16 specific objec -- area that is being proposed to
17 receive the effluent? And then we'll look at what the
18 concentration of that parameter would be in the
19 effluent itself.

20 And then from there, we'll make
21 educated judgments on whether certain impacts may
22 happen as a result of releasing concentration of that
23 parameter in the receiving environment that may reach
24 or -- or exceed that particular guideline. So there's
25 a number of different steps, I guess, that are

1 involved.

2 So first we'd have to look at what the
3 -- the concentration of vanadium is in the receiving
4 environment. And then, from that point, we'd be in a
5 better position to understand how relevant the Ontario
6 guideline would be for Drizzle Lake. So we will
7 endeavour to do that as part of this review process
8 for the site-specific water quality objectives.

9 THE FACILITATOR MERCREDI: And Marc?

10 MR. MARC CASAS: Marc Casas here with
11 the Mackenzie Valley Land and Water Board. Well,
12 that's a bit of a tricky one, I guess, without knowing
13 any -- what measurements or commitments may come out
14 of -- of this process with potentially the regulatory
15 process to follow.

16 But what's happened in the past in
17 terms of determining water quality -- or, site-
18 specific water quality objectives is the Proponent
19 proposes some, which -- which they have here, and --
20 and then all reviewers and commenters were -- are
21 welcome to provide their own, and there would be a
22 technical review of that. And then it would be
23 considered, and that information would be presented to
24 the Board -- the Mackenzie Valley Land and Water Board
25 -- for a decision on the water quality objectives.

1 And -- and those would be -- once those
2 come out there would be a -- a pretty -- the reasons
3 for decision, in terms of outlining why particular
4 ones were chosen. So we don't defact -- we won't
5 defacto accept the -- the Proponent's necessarily.
6 But that doesn't necessarily mean that they won't be
7 the ones.

8 So I hope that helps. But, I mean, I'm
9 -- I'm not the Board, so I can't actually speak to
10 whether they will or will not accept those.

11 MS. STEPHANIE POOLE: Thank you.
12 Stephanie Poole, Akaitcho IMA Office. Just one (1)
13 more thing before I stop, is I had requested from the
14 proponent that they provide a document outlining the
15 tech -- technical aspects of their feasibility study
16 regarding their paste fill plant. And it sounds like
17 the Proponent does not want to provide that. And so I
18 just needed, like, a clear direction.

19 I understand we're going to discuss it
20 some more tomorrow, but I'm just wondering, am I going
21 to be able to get that document from Avalon or not?

22 THE FACILITATOR MERCREDI: As I
23 mentioned earlier, for now, we're going to park the
24 issue, revisit it tomorrow, just to give Review Board
25 staff time to -- to look at that, because that does --

1 the Board's technical consultant has indicated that
2 he'd like to -- basically, the -- the wording is -- is
3 important there. And so basically, we'll revisit that
4 tomorrow.

5 And so if that question remains
6 unanswered, that's because we are essentially saying
7 that we'll re -- revisit that tomorrow. And then --
8 and from then we'll have the appropriate homework for
9 -- for the developer. So does that answer your
10 question? Okay, and for the record, that was a "yes".

11 For -- we have about ten (10) minutes
12 left before we wrap up for the day. Do I -- is there
13 any more within -- that we can fit within ten (10)
14 minutes, Anne? Yeah.

15 MS. ANNE WILSON: It's Anne Wilson,
16 Environment Canada. This will be quick. Following up
17 on Stephanie's question about the aquifer, Kevin had
18 outlined that there were seventy (70) drill holes
19 done, the core reviewed, as well as the shallow
20 geotech drilling. But you didn't say what they found.

21
22 So just wanted to confirm that that did
23 indeed show little to no groundwater or whether it
24 did.

25 MR. KEVIN HAWTON: Kevin Hawton,

1 Knight Piesold. What it showed was that the
2 permeabilities within the rock were very, very low: 10
3 to the minus 9, 10 to the minus 8 metres per second.

4 MS. ANNE WILSON: It's Anne Wilson.
5 Thanks for that. Were there any water samples
6 collected from the deep, deep cores and tested for
7 chemistry?

8 MR. RICHARD HOOS: Yeah. Rick Hoos
9 here. We'll -- we'll complicate things just a little
10 bit by saying that there were actually two (2)
11 groundwater hydrogeological programs conducted at
12 Nechalacho: one (1) set by Knight Piesold, which Kevin
13 has discussed, and another set by Stantec.

14 And Stantec did sample the groundwater
15 from all the wells that they installed, and continue
16 to do so. And those results, the initial results, or
17 the results that were available during preparation of
18 the DAR, were presented in the DAR, both in a -- in a
19 section called "Groundwater Quality" and in -- in one
20 (1) of the appendix documents, again, produced by
21 Stantec, that discussed hydrogeological considerations
22 of the work that they had done.

23 MS. ANNE WILSON: Thanks. It's Anne
24 Wilson. My impression from reviewing those results
25 was that those were the more shallow holes. And so I

1 was interested if there was any deep groundwater
2 samples that were available that would span the actual
3 depth that the bottom of the underground mine would go
4 to.

5 MR. DAVID SWISHER: David Swisher with
6 Avalon. In terms of the depth that the mine would go
7 to, that requires extensive -- extensive work. So the
8 drilling that we had done through Knight Piesold was
9 designed to see what kind of inflows there were,
10 basically because the past experience from a gentleman
11 who actually worked on the 'T' zone, which is next
12 door to that deposit, was a good indicator of the
13 ground conditions as well, because it's all very
14 similar rock.

15 And they had driven a decline over, I
16 think, 150 metres below the surface. And they never
17 encountered any water whatsoever, which confirmed --
18 other than what they pumped into the mine for drilling
19 activities and that sort of thing.

20 So our work program that we outlined
21 for Knight Piesold wasn't necessarily focussed on --
22 on sampling at that depth, because we felt based, on
23 the practical experience that Mr. David Truman
24 (phonetic), Dr. David Truman, had worked at this site
25 and his experience in the past, we wanted to confirm

1 if that would be the same in our area, given the close
2 proximity to -- to our project and where he had
3 worked, actually worked underground. And I think we
4 had confirmed that through the work that Knight
5 Piesold had done and the fact that the -- the prauses
6 (phonetic) and permeabilities were so low.

7 Plus, when you're logging the core,
8 when you see the competency of the core itself, you
9 know, you can hold core from end to end without any
10 fractures or -- or breaks in it, you know, it's tight
11 material.

12 So for us, it was more of a
13 confirmation, I guess, in terms of what we were
14 thinking of, the -- the fact that we're not going to
15 or we most likely may not encounter any water in the
16 mining regime other than what we introduce and/or what
17 -- what filters down from precipitation.

18 THE FACILITATOR MERCREDI: Okay. And
19 if no further questions, we are approaching our wrap-
20 up time. So with that, we'll go to Simon for a review
21 for the Company to -- to -- for -- for them to hear
22 what their homework is.

23 So again, Simon had -- had a list. I
24 believe he's at number 7. So just like when you're
25 filling up with gas and the disagreement between the

1 cashier and the re -- the -- the gauge, this gauge
2 will be taken as correct. Simon, that was his job, so
3 we'll take his -- what he has. And then while
4 everybody's here, we can -- we can look at that.

5 So Simon will read out the -- I don't
6 believe -- I believe we had one (1) commitment and, I
7 think, seven (7) homework items. So with that, Simon
8 Toogood.

9 MR. SIMON TOOGOOD: Thank you very
10 much. I'll start off with some homework. I have
11 number 1 from Anne Wilson being a question on
12 chromium, whether hexavalent or trivalent. And the
13 question is: With respect to Avalon's proposed site-
14 specific water quality objectives as presented during
15 the technical session presentation and with respect to
16 the purpose of determining which CCME -- which CCME
17 guideline value to use for chromium, is the form of
18 chromium listed in the table hexavalent or trivalent?
19 There's -- everyone's fine with that. I'm seeing nods
20 around.

21 We have the next question, again from
22 Anne Wilson, being nitrate as 'N'. Are the values of
23 nitrate as 'N' in the proposed site-specific water
24 quality objective table consistent with CCME values?
25 Is that correct?

1 MS. ANNE WILSON: It's Anne Wilson. I
2 was just plugging -- I think there's an error in the
3 value that was proposed.

4 MR. SIMON TOOGOOD: That the error is
5 with the CCME values, it's not the same?

6 MS. ANNE WILSON: It's Anne Wilson.
7 Yes, the value noted was an order of magnitude higher
8 than the CCME value of nitrate as 'N'.

9 MR. SIMON TOOGOOD: Okay, fair enough.
10 Yeah, by consistent, I meant it's -- it's not the
11 same. So I'll just clarify that -- that it appears an
12 order of magnitude higher. So for Avalon, that would
13 just be to clarify a number.

14 Number 3, in from Environment Canada,
15 is TTS values for Drizzle Lake, and Avalon is to
16 provide the TTS for Drizzle Lake. I'm seeing
17 agreements.

18 Number 4, from Nathan Richea, was
19 changes and updates to water modelling. Essentially
20 the question was: What assumptions were made and what
21 has changed in Avalon's downstream water modelling for
22 Drizzle and Thor Lake? I'm seeing nods.

23 Number 5 is from Ralph Grismala, the
24 question on tracer modelling study clarification. And
25 the request from Avalon is to present a simple

1 calculation of the approximate values of dilution
2 ratios used for tracer modelling studies.

3 Okay, number 6, Avalon to provide a
4 present -- Avalon to provide presentations that were
5 provided today.

6 Number 7 was essentially being asked
7 already -- answered, but that was: Mercury, the
8 lowest detection limits, was it low or ultra low? I
9 think we've agreed that that was answered.

10 THE FACILITATOR MERCREDI: Putting it
11 out there that that has been answered and is no longer
12 homework. I'm putting that out there to the floor
13 just to -- so that there's -- if there's less to do
14 for -- for Avalon tonight, then that's...

15 MR. NATHAN RICHEA: Thank you. It's
16 Nathan Richea. I believe so. I think the answer was
17 they used the ultra low detections.

18 THE FACILITATOR MERCREDI: In that
19 case, go ahead, Ralph.

20 MR. RALPH GRISMALA: Ralph Grismala,
21 ICF Marbek. There -- there was another part when this
22 was being discussed, and it had to do with the use of
23 half the detection limits in the calculations that --
24 that showed up in the table. And I just wanted to
25 make sure that at some point they confirm that they

1 are using half the detection limits and -- and which
2 part of the table -- one (1) of the -- I think it's
3 for the five (5) day decant concentrations.

4 MR. JIM STRONACH: Jim Stronach here.
5 Yeah, that's true. All right.

6 THE FACILITATOR MERCREDI: Okay. So
7 just to clarify, that is resolved, correct? Okay. So
8 that is resolved. Moving on.

9 MR. SIMON TOOGOOD: Number 8 I have as
10 a -- the -- Avalon to provide the five (5) day decant
11 information in the site-specific water quality table
12 as found in the technical session presentation of
13 August 14th, 2012. That was from Nathan.

14 And then that was it, and number 9
15 potentially has to do with the paste fill, and we'll
16 be touching on that tomorrow morning. And there's one
17 (1) commitment, I believe. And this may be a bit
18 long-winded. But essentially, should Avalon propose
19 alternate reagent from those proposed in the DAR for
20 the Nechalacho floatation plant, Avalon will notify
21 the Review Board prior to the public registry for
22 Avalon Thor Lake Rare Earth Element Project being
23 closed. That's everything I have.

24 THE FACILITATOR MERCREDI: Thank you,
25 Simon. And how does that read?

1 UNIDENTIFIED SPEAKER: It reads good.
2 I'd just like to clarify that homework item number 6
3 is completed, as well. I forwarded the presentation
4 to -- to the Review Board.

5 THE FACILITATOR MERCREDI: Very well.
6 Thank you. Consider it resolved. With that, we'll
7 close up for the day. I'll just say before everybody
8 moves, so again, the homework if -- if it does come by
9 tomorrow, that's be great. Homework -- if it's -- if
10 it's within the week, it -- it is homework. Past
11 Friday, it is an undertaking due August 31st.

12 So again we will revisit a couple of
13 things tomorrow. I think today has been very
14 productive. I -- I'd like to thank Avalon for their
15 participation, as well as the parties. We will -- as
16 far at the agenda, tomorrow we do some follow-up from
17 today immediately. We will consider anymore -- we
18 will discuss any further Nechalacho site water quality
19 issues and move onto the hydrometallurgical plant and
20 fish and fish habitats. So that's how the agenda is
21 looking tomorrow.

22 So -- and before we -- before we break
23 for the night, I would like also if -- if there are
24 any sidebar meetings between now -- and this again
25 goes for the week. If there are sidebar meeting after

1 -- after the -- the closure of today or during the
2 week that resolve issues, please speak up for the --
3 the registry so it is captured, it is resolved and it
4 does not have to be revisited. That's just a gentle
5 reminder.

6 So with that, David, do -- do you have
7 any closing comments for today from -- from the
8 company?

9 MR. DAVID SWISHER: Yeah. David
10 Swisher with Avalon. I appreciate everybody's
11 comments. You know, hopefully, you know, we can
12 continue on tomorrow with the same type of positive
13 discussions and move the process along, so thank you
14 very much.

15 THE FACILITATOR MERCREDI: Thank you,
16 David. And with that, everybody is dismissed, and
17 we'll see you tomorrow at 9:00. Thank you very much.

18
19 --- Upon adjourning

20
21 Certified correct,

22
23 _____

24 Wendy Warnock, Ms.

25

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