

THE ALBERTA ENERGY REGULATOR

IN THE MATTER OF
Regulatory Appeal 1927181
to the Alberta Energy Regulator

AER PROCEEDING
VOLUME 1
VIA REMOTE VIDEO

October 13, 2020

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1 Proceedings Taken via Remote Video

2

3 October 13, 2020

4

5 C. Low The Chair

6 C. McKinnon Hearing Commissioner

7 B. Zaitlin Hearing Commissioner

8

9 S. Poitras AER Counsel

10 A. Hall AER Counsel

11 D. Campbell AER Staff

12 E. McKellar AER Staff

13 S. Botterill AER Staff

14 E. Galloway AER Staff

15 T. Turner AER Staff

16 T. Wheaton AER Staff

17

18 L. Berg For ISH Energy Ltd.

19

20 J. Jamieson For Canadian Natural Resources

21 Limited

22

23 S. Howden, CSR(A) Official Court Reporter

24 A. Vidal, CSR(A) Official Court Reporter

25

26

1 (PROCEEDINGS COMMENCED AT 1:01 PM)

2 Opening Remarks

3 THE CHAIR: Good afternoon, everyone, and
4 thank you for participating in the AER's first full
5 and fully electronic hearing.

6 My name is Cecilia Low, and I am chairing this
7 proceeding. The other Panel Members assigned to this
8 proceeding are Claire McKinnon -- and I'll get Claire
9 to say hello -- and Brian Zaitlin. Brian, do you want
10 to say --

11 And the three of us will have the blue AER
12 background, assuming the technology continues to work
13 for us, through the duration of the hearing, and our
14 names should also be visible on the bottom of our
15 frames.

16 So I would like to acknowledge that, as I think we
17 are participating from a variety of spots potentially
18 around Alberta, we are located in the traditional
19 territories of the First Nations of Treaties 6, 7 and 8
20 and the Métis peoples of Alberta.

21 As you know, AER staff are assisting the Panel in
22 this proceeding, and I will ask them to identify
23 themselves, I guess, just with a hello since we don't
24 have them on screen as I say their name.

25 So first we have Alana Hall and Scott Poitras --
26 there you are -- from the law branch. So I see Alana.

1 Scott, where did he go? There we are.

2 MS. HALL: Hello.

3 MR. POITRAS: Hello.

4 THE CHAIR: Thank you.

5 Then we have Tammy Turner, Dean Campbell, and
6 Elizabeth McKellar from hearing services.

7 MS. MCKELLAR: Hello.

8 MS. TURNER: Hello.

9 THE CHAIR: And the technical staff
10 assisting the Panel with this proceeding are Scott
11 Botterill, there he is; Luyi Shen, there he is; Teresa
12 Rempfer; Susan Harbidge; and Elwyn Galloway.

13 Elwyn, are you there?

14 MR. GALLOWAY: I am here. My video is --

15 THE CHAIR: Okay.

16 MR. GALLOWAY: -- not showing, though.

17 THE CHAIR: All right.

18 MR. GALLOWAY: I'm here.

19 THE CHAIR: And you can hear us. That's
20 good. Okay.

21 As this is an electronic hearing, I want to
22 outline a few details before we start, and I'll try not
23 to repeat what was covered in your practice session
24 last week, although I may repeat a couple of important
25 points. I'll also try to avoid repeating too much of
26 the information that would've been included in the

1 detailed procedures document.

2 With the added challenge posed by the electronic
3 format, first identifying and then following who is
4 speaking with a number of frames on the screen at one
5 time, and for Sarah, our court reporter's benefit, I'll
6 ask everyone to first identify themselves, and then say
7 what you have to say slowly.

8 Please also ensure that if there are multiple
9 people in a room -- it wasn't clear to me if that was
10 going to happen for some of the witnesses or not but
11 the person who is speaking is in the video frame and
12 that participants not speak over each other.

13 If you do need to speak, whether to raise an
14 objection or a concern for some other reason, please
15 interject orally and wait for me to recognize you. So
16 if we were in a hearing room, Counsel, you'd stand up,
17 and it would -- that would get my attention. In this
18 case, let's try for now a "Madam Chair" and maybe a
19 wave. A real wave, not a Zoom wave. And that will
20 hopefully get my attention.

21 One change to the detailed procedure --

22 MS. TURNER: Madam Chair, sorry. We're
23 just --

24 THE CHAIR: Oh, okay. Oh, sorry. You
25 weren't just showing a practice wave. You were
26 actually waving. That's why the "Madam Chair" part

1 will be helpful.

2 MS. TURNER: Thank you.

3 THE CHAIR: Are they in? Okay.

4 So one change to the detailed procedures that I
5 think you had received is that all participants except
6 counsel for the parties should remain muted when
7 they're not speaking.

8 The idea comes from feedback that we had after a
9 virtual prehearing that was conducted by a different
10 Panel where counsel for the parties felt the delay in
11 trying to find the unmute button sometimes prevented
12 them from interjecting in a timely manner.

13 So, Ms. Berg and Ms. Jamieson, you can leave
14 yourselves unmuted once we get going, and we'll see how
15 that works.

16 And I think that we will hopefully encounter fewer
17 challenges if we all slow everything down a bit.

18 And, Sarah, if we're going too fast for you for
19 any reason, just let us know. Okay?

20 THE COURT REPORTER: Okay.

21 THE CHAIR: So during the hearing, the
22 Panel will be making notes. So we will be looking down
23 from time to time. It will also likely appear that we
24 aren't looking directly at a witness or witness panel
25 when they're speaking because, of course, we will be
26 looking at them but on our screens, so we won't be

1 looking directly at the camera. So please know that we
2 are all engaged and paying attention.

3 We, like you, also have phones at hand in case we
4 need to communicate between Panel members or between
5 Panel and our counsel. You know, in a hearing room, I
6 could put a sticky note in front of one of my
7 co-panelists or they could put a sticky note in front
8 of me. Here we're going to have to use WhatsApp or
9 some other form of communication that will be
10 phone-based, but we'll try to minimize any
11 interruptions on that basis, and I assume you will be
12 doing likewise.

13 We all need to do our best to juggle our various
14 electronic methods of communication in a way that is
15 the least disruptive to the proceedings. So as I say,
16 please note that we're very much engaged, and we'll
17 assume that you are too. And this probably is a good
18 point for us actually to all check our alternate
19 electronic devices and just make sure that they are, in
20 fact, on silent.

21 I think we would be overly optimistic to expect
22 that we'll go through this whole proceeding without at
23 least one technical glitch. So we will all have to be
24 patient if and when issues occur.

25 You have received instructions about what to do if
26 you do become disconnected. If you're an active

1 participant and are disconnected, we will pause the
2 proceeding as soon as that fact comes to our attention.

3
4 I did want to just -- because it wasn't clear to
5 me whether this was something that had been discussed
6 at all in the practice session, what an active
7 participant is. So I'm just going to throw out there a
8 view of that, and then I will hear from -- from counsel
9 for the parties when we do preliminary matters on this
10 point.

11 But I think for the purposes of this proceeding,
12 an active participant would be a person who's in the
13 process of speaking, counsel for the parties, and
14 counsel for the AER regardless of whether they're
15 speaking, hearing panel members, and our hearing
16 coordinators. If you've got any concerns about that
17 definition, then I'll ask you to raise it as a
18 preliminary matter.

19 If you are disconnected, you should first try to
20 reconnect using the link that hearing services has
21 provided. If that does not work, then please text
22 Ms. Turner at the number she's provided to you. And if
23 your video freezes or we encounter audio difficulties,
24 you may find that you're asked to repeat portions of
25 what was said before the video froze or your audio
26 difficulties started. Please do let me know if you

1 notice that somebody's video is frozen and that's
2 causing problems. During breaks, please be sure to
3 mute your audio if it isn't already muted.

4 If you want to have an exhibit shown on the screen
5 as you are speaking, please ask the hearing coordinator
6 to bring up the document by reference to the exhibit
7 number and then to the specific PDF page number that
8 you want to have shown. The hearing coordinator will
9 also be sharing that document on the -- on the live
10 stream -- I guess the delayed stream or the video
11 stream.

12 If anybody has questions during the course of the
13 proceeding, please feel free to send a direct message
14 to either Ms. Turner or Mr. Campbell or Ms. Hall or
15 Mr. Poitras and ask them for their assistance.

16 And as at an in-person hearing, please do not
17 attempt to communicate privately with the Panel
18 members. I don't think any of you know how to get
19 ahold of us at this point in time anyway, so that's
20 sort of a moot point.

21 As set out in the Panel's notice of scheduling of
22 hearing of September 24th, 2020, this proceeding is
23 being webcast on a YouTube channel and is publicly
24 available from a link on the AER's website. Anyone
25 participating in this hearing will appear on that
26 webcast. Members of the public accessing that link

1 will be able to observe the hearing but cannot
2 participate. The public may also listen to the hearing
3 through an audio only webcast. This link is also on
4 the AER website.

5 Please note that the webcast is not the official
6 transcript of the proceeding. The official transcripts
7 are being provided by our -- prepared by the court
8 reporters and will be posted to the AER website the
9 next day.

10 So now, Ms. Turner, could you please read out the
11 safety procedures and particulars of this proceeding as
12 well as the publication of notice of hearing.

13 MS. TURNER: Yes, Madam Chair.

14 Although this is an electronic hearing, safety is
15 still very important. We encourage everyone to
16 carefully review any potential safety hazards in your
17 homes or the location from which you are participating
18 in this hearing.

19 If an alarm sounds at your location or any other
20 safety issue arises, please let me know, and we will
21 pause the proceedings. Then calmly collect your things
22 and proceed to the nearest safe exit. In the event of
23 medical emergency, call 911. Then alert me as to the
24 situation, and we will pause the proceedings. For any
25 other emergency, please notify me immediately.

26 The Panel has for consideration at

1 today's proceeding Regulatory Appeal 1927181 by ISH
2 Energy Limited. On February 21st, 2019, the AER
3 received a request for a regulatory appeal under Part 2,
4 Division 3 of the Responsible Energy Development Act
5 and Part 3 of the Alberta -- Alberta Energy Regulator
6 Rules of Practice of the AER's decision to approve
7 Canadian Natural's Application 1909395 under the Oil
8 Sands Conservation Act to amend scheme approval 11475.

9 The amended approval 11475EE dated January 24th,
10 2019, permits Canadian Natural to add a seventh
11 steam-assisted gravity drainage box at Section 1,
12 Township 75, Range 9, West of the 4th Meridian, in
13 Canadian Natural's Kirby North in situ oil sands
14 development located approximately 135 kilometres south
15 of Fort McMurray. The AER -- the AER granted a request
16 on February 11th, 2020.

17 The purpose of this hearing is to determine
18 whether the AER should confirm, vary, suspend, or
19 revoke its decision to issue approval amendment
20 11475EE.

21 The notice of hearing and notice of scheduling of
22 hearing are Exhibits 10.01 and 62.01 respectively and
23 were distributed directly to all interested and
24 potentially affected parties within the prescribed
25 notification radius as set out in the AER Directive 56:
26 Energy Development Applications and Schedules.

1 The amended notice of scheduling of hearing was
2 posted to the AER website and emailed to the parties on
3 October 8th, 2020. The original notice of hearing was
4 advertised in the Daily Oil Bulletin. That summarizes
5 the details of the giving of notice of this hearing.

6 Madam Chair, I would like to remind participants
7 that the materials filed for the proceeding, the notice
8 of hearing, and other Panel records and correspondence
9 were marked as exhibits prior to the hearing. All
10 parties to the hearing were sent a copy of the list on
11 October 9th, 2020. Thank you.

12 THE CHAIR: Thank you. Ms. Turner.

13 And will we all be provided with updated exhibit
14 lists as we go through the hearing?

15 MS. TURNER: Yes.

16 THE CHAIR: Okay. Thank you.

17 So I would now like to register the participants
18 in the hearing. Our court reporter, who's preparing
19 the transcripts, would appreciate it if we all -- I
20 also need to be reminded to speak clearly and slowly so
21 an accurate transcript is obtained.

22 Please unmute your microphones as you are called
23 to be registered and mute it for now when you're
24 finished. And just for general notice, the hearing
25 coordinator may mute microphones if they appear to be
26 have left -- to have been left on inadvertently.

1 And I note for the purposes of the transcript that
2 the hearing Panel and parties were advised that the AER
3 regulatory applications group would not be
4 participating in the evidentiary or final argument
5 phase of this hearing. So they won't be entering an
6 appearance.

7 The AER did receive submissions from ISH Energy
8 Ltd., whom I'll refer to from here on usually as "ISH
9 Energy", and from Canadian Natural Resources Limited,
10 who I will refer to as "Canadian Natural".

11 So who is represented ISH Energy?

12 MS. BERG: Good afternoon, Madam Chair.
13 My name is Laura-Marie Berg, and I'm representing
14 ISH Energy Limited in this appeal.

15 I'm not certain with regard to the -- to an
16 electronic hearing. In the normal course, I would
17 introduce my witnesses right now, but if we're going to
18 more of a roll call, I'm fine with that as well. I'm
19 in your hands.

20 THE CHAIR: So if you want to -- why don't
21 we do it this way, if you just advise us orally at this
22 point to confirm for the record who your witnesses are.

23 And then it looked to me like in your written
24 direct evidence there was a more fulsome
25 introduction -- I guess, sorry, to my co-panelist who
26 hates that word -- introduction of them. We can do

1 that at that point.

2 MS. BERG: All right. Well, ISH Energy
3 will be presenting a witness panel comprised of
4 Veronique Giry, who is the chief operating officer of
5 ISH; Edward Mathison, who is a geologist and will be
6 speaking on behalf of ISH; Peter Vermeulen, who is a
7 senior geophysicist; and David Leech, who is a well
8 test specialist.

9 Now, in addition to the witness panel, we have
10 back-row support at this hearing. Jennifer Clee is a
11 reservoir manager of ISH, and Earl Ward is an engineer
12 in training at ISH. And they just -- I'll let people
13 know just how the seating arrangements are working.
14 Mr. Ward, Ms. Clee, Mr. Leech, and Ms. Giry are sitting
15 in a room together and will be wearing masks throughout
16 the proceeding except when they are speaking.

17 In addition, we have Mr. Brett Thompson, who is
18 providing back-row support. He is located at his home
19 today 'cause he has a family member -- like many of us
20 have experienced, a family member who is awaiting a
21 COVID test, and so he will be providing back-row
22 support from home.

23 Mr. Owen Lewis is a geologist with ISH. He is
24 seated in the same room as Mr. Mathison and
25 Mr. Vermeulen. And, sorry, Mr. Lewis is a geologist in
26 training with ISH, and -- and he will be providing

1 support as well to Mr. Mathison, we anticipate,
2 primarily with navigating the very large record on --
3 in geology in this proceeding.

4 And then, finally, I am in a separate room with --
5 from all of the witnesses, and Ms. Hryciw of our office
6 is providing regulatory support. Thank you.

7 THE CHAIR: And so my apologies. I may
8 have missed it. Mr. Leech is located where?

9 MS. BERG: Mr. Leech is in the same room
10 as Ms. Giry, Mr. -- Ms. Clee, and Mr. Ward.

11 THE CHAIR: Okay. Thank you.

12 And then I also have another question. So we had
13 some back-and-forth last week about the witness support
14 with the idea that people providing witness support,
15 who would also be potentially conferring with the main
16 witness panel, would also be sworn so that in the
17 event -- if it was appearing that answers were actually
18 coming from the support and not the witnesses
19 themselves, then questions could be directed to them.
20 So is it your intention to have your witness support
21 people sworn as well?

22 MS. BERG: We have no issue with having
23 our witness support people sworn. We anticipate
24 that -- that the primary witness panel will not need to
25 rely too heavily on them but, yes, happy to do that.

26 THE CHAIR: Okay. Thank you.

1 So now representing Canadian Natural?

2 MS. JAMIESON: Yes. Good afternoon, Madam
3 Chair and panel members.

4 So my name is JoAnn Jamieson, and I confirm I'm
5 here representing Canadian Natural in this proceeding.

6 I can also go through our witnesses, but I'm
7 thinking that might make more sense tomorrow when we're
8 actually seated. But it's completely up to you, Madam
9 Chair. Would you like a rundown on who everybody is
10 and where they're physically located today?

11 THE CHAIR: If you've got that in front of
12 you, why don't we just do that now, and then you can
13 give the more detailed introduction tomorrow when
14 you're seating your Panel.

15 MS. JAMIESON: Sure.

16 So with the Canadian Natural witness panel is
17 Mr. Gerard Iannattone. He's vice president of thermal
18 operations with Canadian Natural, and he is here in the
19 building. For the most part, our witnesses are here in
20 the Canadian Natural building in their own offices --

21 THE CHAIR: Okay.

22 MS. JAMIESON: -- with a couple of
23 exceptions. I'll talk about that.

24 Second is Jason Lavigne, and he is a senior
25 geologist. He will be providing key evidence in the
26 proceeding.

1 Scott Sverdahl, he is a geophysicist and also with
2 Canadian Natural.

3 Mr. Peter Thomsen is a geomechanical specialist,
4 and he's with Canadian Natural.

5 There's Dr. Xiang Wang. So Dr. Wang, also an
6 employee with Canadian Natural. He has a PhD in rock
7 physics and structural engineering, I believe. We'll
8 come back to that tomorrow. I'm going by recollection.

9 Next we have Mr. Dale Walters, and he is a
10 geomechanical engineer, and he is responsible for the
11 geomechanical modelling that was performed by Canadian
12 Natural.

13 Mr. Ryan Craig, he is an operations -- a senior
14 operations fellow, and he's an employee of Canadian
15 Natural.

16 We also have Dr. Tom Boone, and he's an
17 independent third-party witness. He -- expert, rather.
18 He conducted a thorough review of the geomechanical
19 analysis that Canadian Natural performed as well as did
20 his own independent risk assessment of the -- the risks
21 involved.

22 I believe that's our -- sort of our full witness
23 panel. In terms of -- so I believe all of those people
24 are in the building. I think the exception would be
25 Tom Boone.

26 Is that right? Sorry? Dr. Wang is here too or

1 no? Okay. So two of those are at home. Dr. Wang is
2 from home, calling in from home. And Dr. Boone is
3 calling in from home. I believe Dr. Boone is located
4 in Canmore. So we are -- oh, there's a third.
5 Corrected. He's Dr. -- or, sorry, Mr. Thomsen, Peter
6 Thomsen, is calling in from home.

7 And then we have our back-row support. We've
8 identified two. So Devin Ollenberger, and he is also
9 an engineer with Canadian Natural.

10 Is he -- Devin is in the building?

11 So he is here in the building today as well as
12 Mark Scrimshaw, and Mark's from -- the regulatory
13 specialist, and he is also located in the building with
14 us.

15 Where I'm located is in a conference room with two
16 other regulatory people. One is Maude Ramsay. She's a
17 regulatory manager for Kirby in situ development, as
18 well as Heather Sampson, a regulatory coordinator. And
19 we are sharing a large conference room, but we're
20 spread out at two different ends. So that's how we're
21 making that work.

22 If either Ms. Ramsay or Ms. Sampson need to speak
23 or introduce themselves, then I will be muting my
24 microphone so that we don't pick up the -- the feedback
25 in the room.

26 So I believe I caught everybody. Okay. So that's

1 us.

2 Tammy, did you have a question? Sorry,
3 Ms. Turner.

4 MS. TURNER: Excuse me, Madam Chair. We
5 had somebody call in, and I believe it's with Canadian
6 Natural. And I just want to make sure. The first
7 three numbers are 587. The last three numbers are 492.
8 Can we just get -- I believe it is Mr. Craig or
9 Mr. Thomsen called in in addition to having the video
10 on. Perhaps his audio wasn't working. Okay.

11 MR. THOMSEN: I signed in twice, and I'm
12 only using this log-in for audio.

13 MS. TURNER: Okay. Great. Thank you.
14 That's all I wanted to know.

15 MS. JAMIESON: Thank you, Madam Chair. If
16 there's nothing else, then I'll hand it back to you.

17 THE CHAIR: Okay. Thank you.

18 So I'll briefly explain the procedures we are
19 currently planning to -- to use in this hearing. So in
20 accordance with Section 21 of the Alberta Energy
21 Regulators Rules of Practice, all witnesses must give
22 evidence under oath or affirmation.

23 The court reporter will provide for this at the
24 time the witnesses give evidence. Witnesses who are
25 choosing to be sworn will have to have their own Bible
26 or sacred object at hand for that purpose.

1 Please also note that we will not be qualifying
2 expert witnesses in this hearing as is the AER's usual
3 practice.

4 We will follow the order of presentations set out
5 in the AER's Rules of Practice without, of course, the
6 decision-maker.

7 So, first, we will be inviting ISH Energy to
8 provide its direct evidence. Witnesses for ISH Energy
9 will then be available for questioning first by
10 Canadian Natural, then by AER staff, and, finally, by
11 the witness panel -- or, finally, by the hearing Panel.

12 It is the AER's practice to allow witnesses to
13 confer briefly, if necessary, to answer a question. If
14 we find that witnesses are routinely conferring for
15 long periods of time to avoid delaying the hearing, the
16 witness panel may decide to establish a time limit for
17 witness conferral. No one other than sworn witnesses
18 being examined are allowed to confer.

19 Following questioning, counsel for ISH Energy will
20 have an opportunity to conduct redirect examination of
21 the witnesses on matters arising from the questioning
22 of the ISH witnesses.

23 Next, Canadian Natural will present its direct
24 evidence and be subject to questions from ISH Energy,
25 AER staff, and, finally, from the hearing Panel.

26 Following that, counsel for Canadian Natural will

1 have an opportunity to conduct redirect examination of
2 their witnesses on matters arising from the
3 questioning, and the advice about conferring is, of
4 course, the same for Canadian Natural's witnesses as it
5 is for ISH Energy.

6 Finally, we will give ISH Energy the opportunity
7 to present any rebuttal evidence it wishes to provide.
8 If rebuttal evidence is presented, it will be subject
9 to questioning from Canadian Natural as well as from
10 AER staff and the hearing Panel.

11 We'll decide the mode and timing for final
12 argument at the conclusion of the evidentiary portion
13 of the hearing, but we plan to give counsel for the
14 parties an opportunity to share their views on mode and
15 timing for final argument at the opening of the first
16 afternoon session tomorrow. That will give us all a
17 chance to sort of see what the space is like and how
18 we're proceeding.

19 Please do remind me that I intended to raise that
20 if I forget to ask. I can tell you that I think our --
21 our preference all things being equal would actually be
22 to have online oral argument at the end of the week.

23 We plan to take mid-morning and mid-afternoon
24 breaks and may take other short breaks as needed. All
25 of this, of course, is dependent on various
26 developments that can alter our schedule. We will try

1 to be flexible when necessary.

2 It's also my intention to check in regularly to
3 see how the electronic process is working for you so
4 that we can learn and make any necessary adjustments as
5 we go. If there is a matter related to the electronic
6 nature of the hearing that's causing issues or concerns
7 or that you want to raise, please let Ms. Turner or
8 Mr. Campbell know or AER counsel. We do want to ensure
9 a fair and efficient process.

10 So are there any questions about the procedures we
11 intend to follow today? No. I don't see anybody
12 raising their hands or -- or identifying themselves to
13 speak.

14 So before we go into the more formal preliminary
15 matters, I had given you our view about -- about who is
16 an active participant in the hearing so that if they
17 drop off, we'll try and stop as soon as we notice that
18 and not restart until they're back on.

19 Ms. Berg and Ms. Jamieson, do either of you have
20 any concerns about the way we were identifying active
21 participants? No? Ms. Berg is shaking her head.

22 MS. BERG: No. I -- I have no concerns
23 with --

24 THE CHAIR: Okay. Thank you.

25 MS. BERG: -- with that. Thank you.

26 THE CHAIR: Thank you.

1 And Ms. Jamieson?

2 MS. JAMIESON: No concerns. Thank you.

3 THE CHAIR: Okay. Thank you.

4 So preliminary matters, I think we have a couple
5 of things that have been filed recently that we may
6 need to get marked as exhibits. In addition to that,
7 so we've got -- ISH had filed some corrections, and I
8 believe, if I understood correctly, that Canadian
9 Natural didn't have any objection or any concerns about
10 those corrections.

11 First of all, am I -- did I get that right? So,
12 Ms. Jamieson, do you have any concerns about the map,
13 the most up-to-date version of the map showing the well
14 locations? I believe you had requested that the
15 locations that had core that were available be marked.
16 So it looks like those have been marked now.

17 MS. JAMIESON: Correct. We had requested
18 that the publicly available core wells be marked on the
19 map, and we have no concerns. That was completed and
20 filed.

21 THE CHAIR: Okay. So do we have an
22 exhibit -- a new exhibit number for this, Ms. Turner,
23 or how are we doing this?

24 MS. TURNER: Yes. So the cover letter ISH
25 submitted, 2020 October 13 ISH to AER, Version 2 of map
26 of cored wells, will be Exhibit Number 84.01.

1 EXHIBIT 84.01 - Cover letter, 2020 October
2 13, ISH to AER, Version 2 of map of cored
3 wells

4 MS. TURNER: Then the ISH to AER map of
5 cored wells V2 is the actual map. It will be Exhibit
6 84.02.

7 EXHIBIT 84.02 - ISH to AER map of cored wells
8 V2

9 THE CHAIR: Okay. Thank --

10 MS. TURNER: And, Madam --

11 THE CHAIR: -- you.

12 MS. TURNER: -- Chair, I think you started
13 speaking about the corrections to Exhibit 66.01?
14 That was --

15 THE CHAIR: Yes. We have a corrected
16 Kirby Upper Mannville to gas pool map?

17 MS. TURNER: There's a letter submitted by
18 ISH on Friday, October 10th.

19 THE CHAIR: Yes. That attached the map.

20 MS. TURNER: Right. So that would be
21 exhibit -- did you want to speak to that now, or did
22 the -- map of cored wells --

23 THE CHAIR: I think we're done with the
24 map of cored wells because I don't think anybody had
25 any concerns about that. So I will just double-check.

26 So, Ms. Jamieson, did you have any corrections or

1 concerns about the corrected -- about ISH's corrected
2 map showing its mapping of the Kirby Upper
3 Mannville to -- superimposed on the AER designated pool
4 area?

5 MS. JAMIESON: No concerns.

6 THE CHAIR: Okay.

7 MS. TURNER: So that would be marked as
8 Exhibit 85.01. That's 2020 October 09 ISH to AER
9 enclosing corrections to Exhibit 66.01.

10 EXHIBIT 85.01 - 2020 October 09 ISH to AER
11 enclosing corrections to Exhibit 66.01

12 THE CHAIR: And then the other one that I
13 wanted to ask about is: We have the written -- as we
14 had requested, we have the written opening statement of
15 ISH Energy that was filed this morning. I've had a
16 chance to go through it, and it seemed to me that
17 there's information in it that people may want to refer
18 to directly through the proceeding.

19 So my question to Ms. Berg and Ms. Jamieson is
20 whether we should have this marked as an exhibit and if
21 so, whether we should do that now or, Ms. Berg, if you
22 were intending to have it done as you were seating
23 and -- and going through the preliminaries with your
24 Panel.

25 MS. BERG: If we could mark it as an
26 exhibit now, that would be preferable.

1 THE CHAIR: Ms. Jamieson, do you have any
2 concerns about that?

3 MS. JAMIESON: No. We would prefer that as
4 well. Thank you.

5 THE CHAIR: Okay. So, Ms. Turner, can we
6 have an exhibit number.

7 MS. TURNER: Yes. So the cover letter
8 enclosing the opening statement is Exhibit 86.01. The
9 actual opening statement is Exhibit 86.02.

10 EXHIBIT 86.01 - Cover letter enclosing ISH's
11 opening statement

12 EXHIBIT 86.02 - ISH's opening statement

13 THE CHAIR: Okay. Thank you.

14 So is there anything that I have missed in terms
15 of preliminary matters that we should be dealing with
16 before ISH -- I was going to say seats its Panel --
17 before ISH presents its Panel for direct evidence? So
18 hearing nothing and not seeing any waving, I'll now ask
19 counsel for ISH to present its Panel and proceed with
20 its direct evidence after your witnesses have been
21 sworn or affirmed, and I'm going to leave that in the
22 capable hands of our -- of our court reporter.

23 MS. BERG: Thank you, Madam Chair. I
24 have already gone previously through the introductions
25 of our Panel. And just also wanted to note that for
26 our witness panel, Ms. Giry, our expert witnesses,

1 Mr. Mathison, Mr. Vermeulen, and Mr. Leech CVs are
2 found at Exhibit 64.01.

3 Now, I've already noted that for safety reasons we
4 have asked all persons to wear masks when they are
5 speaking. We have tried to anticipate which witnesses
6 will need to convene to discuss responses to questions,
7 and we've seated those witnesses together in the same
8 room.

9 When it is necessary for witnesses to convene as a
10 larger group, or if it is necessary, what we propose is
11 that witnesses move from one room to another where the
12 witnesses in the second room would remain seated so
13 that you're able to see witnesses convening on camera.

14 And in the event if -- in the event that it is
15 necessary for Mr. Mathison to convene with Mr. Brett
16 Thompson, the plan is for the witnesses to mute their
17 computers and to contact Mr. -- Mr. Thompson by
18 telephone.

19 I also wanted to advise that all witnesses are in
20 rooms with two very large screens that are in addition
21 to the laptops that they're using on Zoom. One of
22 those screens will have the Zoom call, and we
23 understand that exhibits will also be broadcast on that
24 screen. And we are going to endeavour to have the
25 exhibits up on the other screen as well. So if
26 witnesses are not facing the camera, as they discuss an

1 exhibit, it is because they are looking at the exhibit
2 on the larger screen.

3 MS. TURNER: Ms. Berg, sorry to interrupt.

4 MS. BERG: Yes.

5 MS. TURNER: We'd like your witnesses -- if
6 your witnesses turn their video on, they will come into
7 the screen as you are speaking.

8 MS. BERG: Okay. So, yes, I would ask
9 actually that all of the ISH witnesses at this time put
10 themselves on the screen.

11 MS. TURNER: Including back row, please.

12 MS. BERG: Including back-row support.

13 Thank you, Ms. Turner. These are things I wouldn't
14 have thought about.

15 THE CHAIR: You're not alone.

16 MS. BERG: It's all rather novel. All
17 right.

18 Ms. Giry, Mr. Mathison, and Mr. Leech will --
19 Mr. Vermeulen and Mr. Leech will speak to the opening
20 statement of ISH that was filed on October 13th and was
21 just entered as Exhibit 86.02.

22 Now, Ms. Giry will speak to the following evidence
23 and materials filed as exhibits in this proceeding. So
24 29.01, the evidence submission from ISH; Exhibits 46.02,
25 46.04, and 46.05, which are the response from ISH to
26 CNRL's information requests, including Appendix B and

1 Appendix C to that response; Exhibit 54.02, the joint
2 submission from ISH and CNRL; Exhibit 63.01, the
3 confidential reply submission from ISH; and Exhibit 66.01,
4 the response from ISH to the Alberta Energy Regulator
5 information request.

6 And Ms. Giry will also be speaking to all of
7 those -- all of the -- the exhibits that were just
8 entered, including her portion of the written opening
9 statement. And we will refer to all of that as the ISH
10 evidence.

11 Mr. Mathison will be speaking to the following
12 evidence and materials that were filled as exhibits in
13 this proceeding, Exhibits 29.01, 29.02 and 29.03, and,
14 specifically, he will be speaking in 29.01 to
15 paragraphs 36 -- or 32 to 62; 29.02, he will be
16 speaking to the stratigraphic cross sections; and then
17 29.03, the structural cross sections.

18 He will also be speaking to IR Responses 1
19 through 4 of Exhibit 46.02. He'll be speaking to
20 Exhibit 46.03 and Exhibit 63.01, the confidential reply
21 submission from ISH at paragraphs 6 through 49 and
22 PDF 91 through 99.

23 And just an added note that Ms. Giry -- while
24 Ms. Giry is speaking to material in the same exhibits,
25 I did want to note that she is speaking to those
26 materials with the exception of those portions that

1 were prepared by Mr. Mathison, by Mr. Vermeulen, and by
2 Mr. Leech.

3 Finally, there's one other piece of evidence that
4 Mr. Mathison prepared, Exhibit 66.01, the confidential
5 response to the Alberta Energy Regulator information
6 request. Mr. Mathison will be speaking to IR's 1
7 through 5 and 11 through 12 as well as the Core Study 2
8 and stratigraphic cross sections that are at Tab 2 and
9 Tab 3 of that response. And we'll refer to that as the
10 evidence of Mr. Mathison.

11 Now, Mr. Vermeulen, will speak to the following
12 evidence and materials filed as exhibits in this
13 proceeding. Exhibit 63.01, confidential reply
14 submission from ISH at paragraphs 50 through 52 and
15 paragraph 90, and we will refer to that as the evidence
16 of Mr. Vermeulen.

17 And, finally, Mr. Leech will speak to the
18 following evidence and materials filed as exhibits in
19 this proceeding. Exhibit 63.01, Mr. Leech's report
20 attached to the confidential reply submission from ISH
21 at PDF pages 52 through 88. And we will refer to that
22 as the evidence of Mr. Leech.

23 So I now wish to request that the witnesses be
24 sworn or affirmed. And, actually, all the -- we have
25 checked with our witnesses and all have decided to be
26 affirmed in order to avoid touching any objects. So if

1 I could ask the court reporter to affirm all the
2 witness, please.

3 VERONIQUE GIRY, PETER VERMEULEN, DAVID LEECH, EDWARD
4 MATHISON, BRETT THOMPSON, EARL WARD, JENNIFER CLEE,
5 OWEN LEWIS, Affirmed
6 Direct Evidence of ISH Energy Ltd.

7 MS. BERG: All right. Ms. Giry, do you
8 have before you copies of the opening statement you're
9 curriculum vitae and exhibits comprising the ISH
10 evidence referred to above?

11 MS. GIRY: Yes.

12 MS. BERG: Can you confirm that the
13 purpose of your appearance in this proceeding is to
14 provide corporate and technical evidence on behalf of
15 ISH?

16 MS. GIRY: Yes.

17 MS. BERG: Can you confirm that your
18 curriculum vitae, as filed on the exhibit on the record
19 as 64.01, accurately sets out your professional
20 qualification and was prepared under your direction and
21 control?

22 MS. GIRY: Yes.

23 MS. BERG: Can you confirm that the
24 evidence that comprises the ISH evidence with the
25 exception of the material that was prepared by
26 Mr. Mathison, Mr. Vermeulen, and Mr. Leech was prepared

1 under your direction and control?

2 MS. GIRY: Yes.

3 MS. BERG: And you adopt that ISH
4 evidence as your evidence in this proceeding?

5 MS. GIRY: Yes.

6 ms. Berg: Can you confirm that the ISH
7 evidence is accurate to the best of your knowledge and
8 belief?

9 MS. GIRY: Yes.

10 MS. BERG: Do you have any corrections or
11 revisions to make to the ISH evidence?

12 MS. GIRY: Yes. At Exhibit 46.02, PDF
13 page 7, I make reference to a voluntary safe disclosure
14 report regarding a well located at 10-34. The
15 voluntary safe disclosure report is attached as
16 Exhibit 46.05.

17 In that report, I advised that efforts were made
18 to test and restart the 10-34 well on January 3rd
19 and 4th. Before the field operator was advised, this
20 was a GOB well. We have conducted subsequent
21 inquiries, and I am advised by the field operator that
22 efforts to prepare for testing the well began in late
23 December 2019. Restart of the well did not happen,
24 and, in any case, it would have required internal
25 approval which would not have been given as it is a GOB
26 well.

1 MS. BERG: Ms. Giry, do you adopt each of
2 the exhibits referred to as the ISH evidence listed
3 above in the opening statement filed on October 13,
4 2020, as part of the evidence of ISH Energy in this
5 proceeding?

6 MS. GIRY: Yes.

7 MS. BERG: And do you adopt the evidence
8 of Mr. Mathison, the evidence of Mr. Leech, and the
9 evidence of Mr. Vermeulen as evidence of ISH in this
10 proceeding?

11 MS. GIRY: Yes.

12 MS. BERG: All right. Thank you.

13 Mr. Mathison.

14 MR. MATHISON: Yes.

15 MS. BERG: Do you have before you copies
16 of your curriculum vitae and the exhibits comprising
17 your evidence listed as the evidence of Mr. Mathison?

18 MR. MATHISON: Yes.

19 MS. BERG: Mr. Mathison, can you confirm
20 that the purpose of your appearance in this proceeding
21 is to speak to the opinion evidence you submitted as
22 ISH's independent expert witness?

23 MR. MATHISON: Yes.

24 MS. BERG: Can you confirm that your
25 curriculum vitae is filed on the record at Exhibit 64.01,
26 sets out your professional qualifications, and was

1 prepared under your direction and control?

2 MR. MATHISON: Yes.

3 MS. BERG: Can you confirm that what I
4 have referred to as the evidence of Mr. Mathison was
5 prepared under your direction and control?

6 MR. MATHISON: Yes.

7 MS. BERG: Can you confirm that this
8 evidence is accurate to the best of your knowledge and
9 belief?

10 MR. MATHISON: Yes.

11 MS. BERG: Do you acknowledge and confirm
12 that you have a duty to provide opinion evidence to
13 this Regulator that is fair, objective, and
14 non-partisan?

15 MR. MATHISON: Yes, I do.

16 MS. BERG: Does your evidence disclose
17 the information upon which it is based, including a
18 description of any factual assumptions made, research
19 conducted, and any other documents or data relied on
20 in --

21 MR. MATHISON: Yes.

22 MS. BERG: -- preparing your evidence?

23 MR. MATHISON: Yes.

24 MS. BERG: Do you have any corrections or
25 revisions to make to your evidence?

26 MR. MATHISON: Yes, I do. I would like to

1 simply -- I would simply like to note that my initial
2 report, which is Appendix K of Exhibit 29.01, it was
3 prepared without the benefit of significant amount of
4 core data. It was provided by CNRL in Exhibit 49.02
5 and 53.02.

6 My latter -- the -- my latter evidence, including
7 evidence of Exhibit 63.01 and 66.01, does reflect the
8 receipt of this additional core data.

9 I also want to clarify some issues on the record
10 with regard to stratigraphic nomenclature framework.
11 Although I use a different nomenclature, there's a
12 general agreement between me and CNRL on this
13 regional stratigraphy. With regards to where we
14 disagree, I'm at the view that what CNRL calls the
15 "post B2 non-reservoir" is predominantly inclined
16 heterolithic stratification.

17 I'm also of the view that although CNRL recognizes
18 a truncation surface at the Wabiskaw D, their image at
19 Time 8 of Tab 1 in their Exhibit 65.01, PDF 29,
20 minimizes the depth of incision in the immediate
21 vicinity of the KNO6 box.

22 MS. BERG: Mr. Mathison, do you adopt
23 what I have referred to as the evidence of Mr. Mathison
24 as your evidence in this proceeding?

25 MR. MATHISON: Yes, I do.

26 MS. BERG: And Mr. Mathison -- and I'm

1 sure there will be many reminders throughout the
2 proceeding. But if you could speak a little more
3 slowly in particular with the terminology and the
4 geology.

5 MR. MATHISON: Right.

6 MS. BERG: I think -- I think that --

7 MR. MATHISON: My Apologies.

8 MS. BERG: -- that would be helpful to
9 the court reporter.

10 MR. MATHISON: Sure. My apologies.

11 MS. BERG: Mr. Vermeulen.

12 MR. VERMEULEN: Yes.

13 MS. BERG: Do you have before you copies
14 of your curriculum vitae and the exhibits comprising
15 your evidence which I have referred to as the evidence
16 of Mr. Vermeulen?

17 MR. VERMEULEN: Yes.

18 MS. BERG: Can you confirm the purpose
19 of your appearance in this proceedings is to speak to
20 the opinion evidence that you submitted as ISH's
21 independent expert witness?

22 MR. VERMEULEN: Yes.

23 MS. BERG: Can you confirm that your
24 curriculum vitae is filed on the record at Exhibit 64.01
25 accurately sets out your professional qualifications
26 and was prepared under your direction and control?

1 MR. VERMEULEN: Yes.

2 MS. BERG: Can you confirm what I have
3 referred to as the direction of -- what I have referred
4 to as the evidence of Mr. Vermeulen was prepared under
5 your direction and control?

6 MR. VERMEULEN: Yes.

7 MS. BERG: Can you confirm this evidence
8 is accurate to the best of your knowledge and belief?

9 MR. VERMEULEN: Yes.

10 MS. BERG: Do you acknowledge and confirm
11 that you have a duty to provide opinion evidence to
12 this Regulator that is fair, objective, and
13 non-partisan?

14 MR. VERMEULEN: Yes.

15 MS. BERG: Does your evidence disclose
16 the information upon which it was based, including a
17 description of any factual assumptions made, research
18 conducted, and any other documents or data relied upon
19 in preparing the evidence?

20 MR. VERMEULEN: Yes.

21 MS. BERG: Do you have any corrections or
22 revisions to make to your evidence?

23 MR. VERMEULEN: No.

24 MS. BERG: Mr. Vermeulen, do you adopt
25 what I have referred to as the evidence of Mr. Vermeulen
26 as your evidence in this proceeding?

1 MR. VERMEULEN: Yes.

2 MS. BERG: Thank you.

3 Mr. Leech, do you have before you copies of your
4 curriculum vitae and the exhibit comprising your
5 evidence which I have referred to as the evidence of
6 Mr. Leech.

7 MR. LEECH: Yes, I do.

8 MS. BERG: Can you confirm that the
9 purpose of your appearance in this proceeding is to
10 speak to the opinion evidence that you submitted as
11 ISH's independent expert witness?

12 MR. LEECH: Yes.

13 MS. BERG: Can you confirm that your
14 curriculum vitae as filed on the record at Exhibit 64.01
15 accurately sets out your professional qualifications
16 and was prepared under your direction and control?

17 MR. LEECH: Yes.

18 MS. BERG: Can you confirm that what I
19 have referred to as the evidence of Mr. Leech was
20 prepared under your direction and control?

21 MR. LEECH: Yes.

22 MS. BERG: Can you confirm that this
23 evidence is accurate, to the best of your knowledge and
24 belief?

25 MR. LEECH: Yes.

26 MS. BERG: Mr. Leech, do you acknowledge

1 and confirm that you have a duty to provide opinion
2 evidence to this Regulator that is fair, objective, and
3 non-partisan?

4 MR. LEECH: Yes.

5 MS. BERG: Does your evidence disclose
6 the information upon which it is based, including a
7 description of any factual assumptions made, research
8 conducted, and any other documents or data relied on in
9 preparing the evidence?

10 MR. LEECH: Yes.

11 MS. BERG: Do you have any corrections or
12 revisions to make to your evidence?

13 MR. LEECH: No.

14 MS. BERG: Mr. Leech, do you adopt what I
15 have referred to as the evidence of Mr. Leech as your
16 evidence in this proceeding?

17 MR. LEECH: Yes.

18 MS. BERG: Thank you.

19 Madam Chairman, Ms. Giry, Mr. Mathison, and
20 Mr. Leech will now deliver ISH's opening statement, and
21 I now turn it over to Ms. Giry.

22 THE CHAIR: Thank you.

23 MS. GIRY: Good afternoon, Panel Members.
24 My name is Veronique Giry, and I'm the chief operating
25 officer at ISH Energy limited.

26 ISH has been an oil and gas producer in Alberta,

1 Saskatchewan, and British Columbia for 30 years. We
2 are proud to work in Alberta's oil and gas sector and
3 to employ highly skilled workers in a sector that is so
4 vital to Alberta's economy.

5 ISH's core values are integrity, long-term
6 performance, humility, agility, and sharing knowledge.

7 Regarding my own background, I am an engineer and
8 have been working for 30 years in the oil and gas
9 upstream industry. I worked for the Total Group, a
10 major international energy company for many years on
11 projects around the world, including Total's SAGD
12 operations in Alberta.

13 I spent almost two years at the Alberta Energy
14 Regulator as vice president of the industry operation
15 branch and then have been with ISH since 2018.

16 We found this regulatory appeal to be difficult.
17 We are a relatively small company doing our best to
18 work in an economic environment that is extraordinarily
19 challenging with the double impact of COVID-19 and a
20 very low world oil price.

21 As we noted in our application, we believe that
22 ISH is the last non-SAGD operator that still owns gas
23 rights in the gas over bitumen or GOB zone. We have,
24 therefore, been in a position where we lack the
25 information and experience that CNRL has in order to
26 assess the impact of CNRL's operation on our gas

1 rights.

2 Finding expertise among consultants that would be
3 willing to be affirmed at this hearing in a case
4 against CNRL has also been challenging. We expected
5 CNRL would take steps to develop its bitumen in a
6 manner that respects ISH's ability to ultimately
7 produce its currently shut-in gas.

8 ISH has significant concerns about the potential
9 impacts of CNRL'S KN06 operations on our gas rights
10 which led us to commence this regulatory appeal. The
11 additional information that we have been allowed to
12 access as part of this appeal has made it clear to us
13 that CNRL did not provide critical information in its
14 application, information that we believe would have
15 prevented the approval and appeal from being issued.

16 One of the main concerns were the fact that the
17 AER was led to conclude that the GOB zone was not
18 affected because the Clearwater caprock shale in situ
19 stress was higher than the max operating purchase of
20 7 MPa. All parties now agree that Clearwater shale is
21 excluded from the review of this appeal as the GOB zone
22 is located below this shale barrier.

23 The CNRL application was approved in January 2019.
24 ISH's gas asset in the Wabiskaw B sits under the
25 Clearwater caprock and above CNRL's McMurray B2 bitumen
26 reservoir. It is ISH's understanding that the AER's

1 mandate is to prevent the waste of gas resources and
2 offer each owner an opportunity to opt in its share of
3 production from any oil and gas pool.

4 ISH points out that CNRL's application for the
5 KN06 drilling and operations would not be in compliance
6 with Directive 23. Directive 23, paragraph 7.10 says
7 that the AER requires in situ operations to be
8 conducted in a manner that ensures reservoir fluid
9 containment.

10 Item 3 requires an in situ operator to discuss the
11 presence of water and gas bearing intervals between the
12 caprock and the bitumen pay zone within the target
13 reservoir. This is also -- this also requires
14 including an isopach map of these intervals.

15 The CNRL application did not make mention of the
16 Wabiskaw B gas and did not consider the impact of
17 CNRL's operations on this ISH gas resource. ISH
18 believes that if the AER regulatory applications branch
19 had access to the information that is now on the record
20 of this proceeding, it would have either refused to
21 grant the application or would've granted the
22 application with significantly different conditions on
23 CNRL's approval. Such conditions include
24 lower start-up and operating pressures, a requirement
25 for monitoring well in KN06, or 4D seismic.

26 Further, in its application, CNRL did not

1 differentiate Kirby North geology from Kirby South
2 geology. CNRL, as stated, did not mention the presence
3 of the GOB zone. CNRL did not provide a review for any
4 potential sealing intervals between the McMurray B2
5 and Wabiskaw B GOB zone. CNRL proposed operating
6 conditions that could exacerbate the potential of
7 communication between the bitumen zone and the GOB
8 zone. CNRL did not identify the risks of SAGD
9 operation in the KN06 on the GOB Zone. And CNRL did
10 not provide monitoring and mitigation appropriate to
11 the facts observed at and around KN06.

12 During the course of this appeal, ISH has finally
13 been able to see the information that CNRL has that it
14 neglected to provide until forced to do so or developed
15 during the AER process. That information makes it
16 clear that ISH was correct to have significant concerns
17 about the impact of the KN06 approval under the appeal
18 and its effect on ISH's overlying gas.

19 Initially, ISH was concerned by CNRL's maximum
20 operating pressure, or MOP, during circulation causing
21 fractures to potential existing sealing layers. ISH is
22 now concerned not only with the start-up pressure and
23 the possibility of hydraulic fracturing. ISH notes
24 that there are also other existing leakage pathways
25 such as noncontinuous sealing layers, existing
26 fractures and faults where potential sealing layers may

1 exist and, finally, a proven wellbore integrity issue.

2 I am going to briefly outline what the data
3 provided by CNRL in this proceeding reveals, and we'll
4 then ask each of the experts that ISH has retained to
5 give a brief overview of that evidence.

6 Issue Number 1, the presence, absence of an
7 effective barrier or top seal overlying the bitumen
8 bearing McMurray formation and, if present, its
9 relative characteristics in the area of the CNRL KN06
10 box.

11 The evidence provided by CNRL reveals that the
12 confining strata are not continuous and not a competent
13 seal. The post B2 non-reservoir just above the
14 McMurray B2 bitumen reservoir which consists of
15 inclined heterolithic stratifications, or IHS, that are
16 inclined limited layers of mudstones and sandy
17 intervals filled with bitumen is not a sufficient
18 barrier.

19 The B1 mudstone just above the B2 is thin or
20 absent in the KN06 drainage box. And the A2 mudstone
21 above the B1 mudstone varies from zero to 0.8 metres
22 and is absent from the northwest corner of the KN06
23 box.

24 Issue Number 2, the risk of fractures or other
25 breach of the barrier/top seal, if it is present,
26 resulting from CNRL operations in the KN06 box.

1 The evidence produced by CNRL in this proceeding
2 demonstrates that natural fracturing in the formations
3 overlying the KNO6 area is prevalent. The geological
4 story told by the core samples, well log correlations,
5 seismic, and the oil water contact demonstrate that
6 there are fractures and faults that create leakage
7 pathways for steam and sour gas to migrate to ISH's
8 resources.

9 The seismic interpretation produced by CNRL in
10 this appeal was not a thorough review, and it doesn't
11 go far enough to demonstrate that no fractures or
12 faults exist. The review materials that are included
13 leave more questions than are answered and, in some
14 cases, support the evidence of fractures and faulting
15 from the core samples in and around the KNO6 box.

16 CNRL asks -- CNRL asks to be able to inject steam
17 at a MOP above the minimum in situ stress. CNRL
18 asserts that the leak-off effect and potential mudstone
19 barriers will limit vertical growth of any hydraulic
20 fractures that could be formed during circulation, but
21 this fails to account -- this fails to account for the
22 longer-term effect.

23 ISH believes that the steam chamber will encroach
24 on ISH's GOB zone because of pre-existing fractures and
25 faults, the absence of A2 mudstone in the northwest
26 corner of KNO6. And a well integrity issue.

1 There is an issue with the 10-01-75-09 well, the
2 10-01 well. The 10-01 well was initially not thermally
3 compliant. In 2005 [sic], CNRL worked over the well to
4 set a thermal cement plug inside the tubing below the
5 GOB perforations.

6 In March 2019, CNRL installed a downhole
7 pressure/temperature engage with the dual purpose to
8 monitor this wellbore for thermal well integrity and to
9 acquire data in the GOB zone.

10 ISH's expert, Mr. David Leech, has reviewed the
11 data and has concluded that the data demonstrates the
12 possibility that the well could be channelling
13 gas behind casing from the GOB zone into the Upper
14 Manville HH gas pool.

15 CNRL has argued that another GOB well would have
16 been produced to explain depletion of the GOB zone.
17 Analysis of the data available since March 2019 is
18 clearly highlighting that there is a significant issue
19 at the 10-01 well.

20 The bottom of the 10-01 well is located within
21 18 metres of a proposed steam injector inside KNO6.
22 The 10-01 well is located within 150 metres of KNO5,
23 which is already injecting steam at pressures four
24 times higher than the current GOB pressure. CNRL
25 cannot be allowed to commence drilling at KNO6 if the
26 10-01 well is compromised and is, therefore, a

1 potential conduit for steam and sour gas.

2 Issue 3, the need for an observation well in the
3 KN06 box. Even in the absence of issues such as we see
4 for the KN06 box, other in situ operators use
5 combinations of observation wells, pressure temperature
6 measurements, 4D seismic and gas analysis to monitor
7 SAGD operations.

8 For the KN06 box, the evidence shows the absence
9 of an effective barrier. Fractures and faults in
10 potential sealing layers are present in and around the
11 KN06 box, and the 10-01 well could be compromised.
12 This clearly indicates that more rigorous monitoring
13 methods need to be deployed and maintained to monitor
14 steam chamber growth at KN06.

15 CNRL has justified the removal of observation
16 wells in Kirby North by asserting similarities between
17 the Kirby North and Kirby South SAGD reservoir.
18 However, the decision for the KN06 must be made on the
19 data specific to the KN06 box and cannot be made on the
20 basis of CNRL's other SAGD operations.

21 The KN06 data indicates significant risks to
22 the -- ISH's GOB zone if the CNRL's bitumen resource
23 development is allowed to proceed under the current
24 approval with no additional monitoring and mitigation
25 in place.

26 As demonstrated by the evidence, CNRL risk

1 identification for steam and sour gas migration into
2 the GOB zone was limited to the early hours of the
3 circulation phase and does not consider any
4 other leakage pathways, even when compelling data from
5 the 10-01 well were available.

6 Requiring additional monitoring, including the
7 drilling of an observation well, will provide necessary
8 data to identify risks and potential mitigation to
9 avoid communication between the bitumen zone and the
10 GOB zone that can happen during the lifetime of SAGD
11 operations.

12 A risk not identified is a risk not managed. ISH
13 requests a mechanism that can identify and mitigate the
14 risk of communication between the bitumen zone and the
15 GOB zone.

16 I will now ask the experts who have been retained
17 by ISH to speak briefly to their evidence. We will
18 begin with Ed Mathison, who will speak about geology;
19 followed by Peter Vermeulen, who will speak about
20 geophysics; and David Leech, who will address the 10-01
21 well integrity issue.

22 MS. BERG: Just one moment. I did want
23 to confirm that before we move to Mr. Mathison that all
24 of the Panel members have a copy of the opening
25 statement available because Mr. Mathison will
26 be referring -- Mr. Mathison and Mr. Vermeulen will be

1 referring to exhibits in the proceeding that have been
2 copied into the -- into the opening statement.

3 THE CHAIR: So I can confirm that I do,
4 but I'll just ask Ms. McKinnon and Mr. Zaitlin to
5 confirm that they do as well. I know they were
6 circulated electronically earlier this morning.

7 MS. MCKINNON: I do.

8 DR. ZAITLIN: Yes, I do. I have a copy
9 right here.

10 THE CHAIR: Okay. Thank you.

11 The one thing I would ask then, as they go
12 through, it would be useful when they are referring to
13 specific sections of an image, if they've got -- I have
14 seen in other Zoom meetings a pointer that can be used
15 to identify specific -- if that is technology that we
16 have access to and you're able to use, let's do that.
17 If not, then we'll just have to do the best we can with
18 describing it in words where you want us to look at and
19 what specifically you're asking us to notice. Thank
20 you.

21 MS. BERG: What we might try to do --
22 there are a few computers in that room, and so, yeah,
23 if the exhibit comes up, maybe what we can do is ask
24 that one person turn their computer so that
25 Mr. Mathison can be seen pointing at the exhibit.
26 We'll maybe try that and see how it goes.

1 MR. CAMPBELL: Madam Chair, it's the Zoom
2 host speaking as well. If you would like a particular
3 exhibit to be brought up on screen that I can share to
4 everyone, I can do that as well.

5 THE CHAIR: Yeah. Well, let's maybe --
6 well, we can maybe try it both ways and see what works
7 best for people in terms of being able to convey the
8 information that you want us to get from the exhibit.

9 Mr. Mathison, you're on.

10 MR. MATHISON: Good afternoon, Panel. My
11 name is Ed Mathison, and I've been retained by ISH to
12 examine the geological evidence in this proceeding.

13 My scope was to look at the presence/absence of an
14 effective barrier or top seal overlying the bitumen
15 bearing McMurray formation and, if present, to
16 determine its relevance, characteristics in the area of
17 the CNRL KN06 box from where there were existing
18 fractures or other breaches of the barrier/top seal.

19 To perform my review, I compiled information from
20 well logs and cores observations to create isopach maps
21 for each of the layers that CNRL indicated would work
22 together to form an effective barrier overlying the
23 bitumen zone and structural cross-sections. Excuse me.

24 The evidence clearly indicates that fractures are
25 prevalent throughout the vicinity of the KN06 box.

26 There is also evidence of faults that can be seen in

1 core photographs and are inferred from the differences
2 in the oil water contact and in the seismic data
3 that -- that has been provided to these proceedings.

4 The B2 is not a sufficient barrier. The McMurray
5 B2 regional varies from 3 to 1 metres throughout the
6 KN06 area. Given that the McMurray B2 is a tidal flat
7 assemblage that -- that grades from dominantly
8 sandstone to dominantly mudstone and is bitumen
9 saturated, it cannot be interpreted as a barrier to
10 steam. What I've called the B2 valley fill reservoir
11 is comprised of -- there is -- comprised of muddy
12 silty inclined heterolithic stratification, IHS. Sandy
13 intervals within the strata are bitumen saturated.

14 The muddy silty IHS passed laterally to sandy IHS
15 both along the strike of the reservoir and down dip
16 or -- where this occurs, the reservoir is almost
17 entirely made up of sandy strata up to the base of the
18 regional B2 layer indicating that the entire valley
19 fill succession is one continuous reservoir with local
20 baffles.

21 The B1 mudstone is thin or absent in the KN06
22 drainage box. Finally, the A2 mudstone is not a
23 sufficient barrier. It is a thin to nonexistent layer
24 in -- in and around the KN06 box.

25 The parties agree that this is completely -- that
26 it is completely absent from the northwest corner of

1 the KN06 box. The presence of fractures and faulting
2 raise additional questions regarding whether a thin
3 A2 mudstone in the KN06 box would act as a kind of
4 barrier between the steam chamber and the overlying GOB
5 zone.

6 Much of the geological story is found in the well
7 cores and well-log correlations from the area. In this
8 opening statement, I would like to walk you through the
9 evidence from some of those wells.

10 And would you -- so this is Exhibit 53.02, PDF 41,
11 and it's the 1AA/02-01 well, and it's a core going from
12 the Paleozoic into the overlying McMurray formation.

13 The photo we will look at -- be looking at first
14 are in the 'A' -- 1AA/02-01 well. The core photo I am
15 commencing with is from the basement in the Paleozoic.

16 If you look at the bottom column on the left-hand
17 side -- can we show this? So that's the bottom column.

18 THE CHAIR: So, Mr. Mathison, I --

19 MR. MATHISON: Yes.

20 THE CHAIR: -- think we can probably get
21 hearing services to bring up Exhibit 53.02, PDF page 41
22 on the screen or a screen for us. So I'll ask them to
23 do that, and let's see what happens.

24 MR. MATHISON: That would be very helpful.

25 Thank you --

26 THE CHAIR: Okay.

1 MR. MATHISON: -- Madam Chairman.

2 THE CHAIR: Since we're not in the hearing
3 room, I can't -- oh, there we go.

4 MS. TURNER: So Exhibit 53.02, PDF page 41
5 is -- was one of the confidential exhibits filed. So
6 the public version does not have any of the photos.

7 THE CHAIR: So let me ask Ms. Jamieson
8 whether Canadian Natural has a concern about putting
9 the same photo that appears in the printed version of
10 the opening statement that we all received on the
11 screen and, therefore, out on YouTube.

12 MS. JAMIESON: Yes. Understood. And we have
13 no concern.

14 THE CHAIR: Okay. Thank you.

15 MS. TURNER: So to clarify, we will put up
16 the opening statements.

17 MR. CAMPBELL; I want to clarify I'm not
18 putting up the opening statement. I'm putting up
19 page 41 of Exhibit 53.02

20 MS. TURNER: No. Because that is a
21 confidential --

22 THE CHAIR: Let's --

23 MS. TURNER: Okay.

24 THE CHAIR: So instead of -- Mr. Campbell,
25 if you can put up the opening statement and then go to
26 PDF page 8, and let's see if the resolution we get is

1 sufficient on that.

2 MR. CAMPBELL: Okay. Well, give me a moment
3 to locate the opening statement. Do we have an exhibit
4 number for that?

5 THE CHAIR: 86.02.

6 MR. CAMPBELL: And page 8?

7 THE CHAIR: Yes, please.

8 MR. CAMPBELL: Okay.

9 THE CHAIR: So can you see that,
10 Mr. Mathison?

11 MR. MATHISON: Yes, I can. Thank you --

12 THE CHAIR: Okay.

13 MR. MATHISON: -- very much.

14 So to go back to this, you'll look at the bottom
15 column on the left-hand side, and you'll notice that
16 there is a significant fracture going -- a significant
17 vertical fracture. In addition, since you cannot match
18 the stratigraphic sedimentary layering across this
19 fracture, it indicates there has been vertical
20 displacement indicating that this is, indeed, a fault.

21 Let's go on to moving up from the basement. Now,
22 this is Exhibit 53.02, PDF 39.

23 THE CHAIR: So, Dean, it'll be the next
24 page. It's PDF page 9 of the opening statement.

25 MR. CAMPBELL: Sorry. I am stuck on
26 annotate. I need to take that off.

1 MR. MATHISON: Okay. Moving up from the
2 basement, if we look at the second column from the top,
3 in this photo, it is heavily fractured, forming an
4 orthogonal pattern.

5 As we move to the top of core of the second
6 column, the fracturing is so intense that we see
7 brecciation or, in other words, complete shattering of
8 the sedimentary layer.

9 It is evident from this photo that the fracturing
10 was post-depositional, and after lithification or, in
11 other words, after it has been turned into mudstone.

12 I'd also like you to look at the second column
13 from the bottom of this core photo. You'll notice
14 there is a sand-filled fissure penetrating the
15 underlying mudstone. This is evidence of an open
16 fracture filled from -- with sand from an overlying
17 unit.

18 This -- the next is Exhibit 53.02, PDF 33. So
19 it'll be page 10 of the -- that's it. Very good.
20 Moving up further in the core -- can we all see the
21 core? There. That's better. Thank you.

22 Moving up further in the core of the 02-01 well, I
23 would like to begin with the second column from the
24 bottom. You will see at the right-hand side that this
25 column has a vertical fracture. Oh, sorry. I made a
26 mistake. I -- I've -- I've jumped a line.

1 If we begin with the second column from the
2 bottom, if you look at the left of the core near the
3 top of the column, you will see highly distorted
4 strata. Sedimentary layering -- layers are broken and
5 lack continuity. So that's just right above the 485
6 mark.

7 We'll go to the third column from the bottom, and
8 you'll see on the right-hand side that this column has
9 a vertical fracture and that the overlying silty
10 mudstone have highly variable inclinations suggesting
11 that it's been completely fractured after
12 lithification.

13 If we move up to the third column from the top,
14 you'll note that to the right close to the 484 marker,
15 the sandstone bed has been truncated by a small fault.

16 Are you following me where this is? The
17 truncation is between the sand and the mudstone.

18 THE CHAIR: So if you were to give a
19 description, you say just to the right of the 484
20 marker.

21 MR. MATHISON: Yes. And just above it. Do
22 you see that that -- there's a bitumen-stained layer in
23 there? Typically, these bitumen-stained layers are
24 continuous. This one has been truncated, and it
25 juxtaposes the -- the bitumen-stained sandstone against
26 a mudstone, a grey mudstone.

1 MR. CAMPBELL: Madam Chair, I believe
2 Mr. Mathison can annotate on the documents, if you
3 would like him to be able to do that.

4 MR. MATHISON: Can I? Just a second. Can I
5 confer? One second.

6 THE CHAIR: So, Dean, the annotation,
7 would that give him a pointer or an arrow that he can
8 use to sort of ring a circle around what he's talking
9 about or something like that?

10 MR. CAMPBELL: It will -- yes. He can
11 choose, like, an ink colour and then just draw or make
12 a mark on something. It won't save it as a permanent
13 part of the record. If they want it saved, we would
14 then have to take a screenshot and save that.

15 So he would need to go up to the top where it says
16 "annotate" and pull down, and then he can select a
17 mouse just to point or to draw to be able to make a
18 mark.

19 MS. BERG: I believe Ms. Hryciw's trying
20 to assist him with that.

21 MR. MATHISON: Would you like me to -- just
22 to point out some of the previous ones, or do you want
23 me to just keep going?

24 THE CHAIR: Well, if you could point out
25 the one you were just talking about.

26 MR. MATHISON: Right. It's right here. Can

1 you see this here?

2 MS. BERG: No.

3 MR. MATHISON: You see this sandstone bed?

4 What? Oh, okay. Right there.

5 MS. BERG: There we go. Yes.

6 MR. MATHISON: Yeah. Okay. I think we've
7 got the technology figured out now.

8 So that's the -- that's the 44 -- if we move up to
9 through the column, you'll note that the -- right close
10 to the 484 marker, the sandstone bed has been truncated
11 by a small fault.

12 Yeah. And then moving up to the second column.

13 THE CHAIR: You may have to actually go
14 click on the arrow and then click again where you want
15 to put it, if you're wanting to move the arrow.

16 MR. MATHISON: How do we -- yeah. No. I
17 want to just move it up or put a new one. Okay.

18 Sorry.

19 Moving up to the second column, top, to the right
20 of the column, you can see that the thin sandstone bed
21 has been truncated by -- oh, sorry. Yeah. This is the
22 final one. The second column from the top. I think
23 this may be an error. Yeah. I think we'll just ignore
24 that, and we'll go to the final 46.

25 Finally, moving to the centre of the second column
26 from the top just to the right of the red line, so just

1 in this area, there's a sand-filled fracture that
2 indicates that the timing of fracturing occurred after
3 oil migration and degradation into bitumen. So you can
4 see this. That's a fracture coming through there.

5 Moving on to Exhibit 53.01, PDF 29.

6 THE CHAIR: So page 11.

7 MR. MATHISON: Yes. Sorry. My apologies.

8 THE CHAIR: No. No worries.

9 MR. MATHISON: Okay. How do we get to --
10 we'll do this one.

11 Finally moving to the top of the McMurray
12 Formation and the base of the Wabiskaw, if you look
13 at -- to the -- look to the bottom column on the
14 right-hand side, you will see a highly deformed strata
15 that has been cut by small fractures. You can see the
16 small fractures.

17 If you move to the top column just to the left of
18 the 467, so let's -- 467 marker, you will see a
19 vertical fracture that extends upward. This is a
20 post-bitumen fracture.

21 To summarize, in the 1AA/02-01 well, the core
22 photos demonstrate fracturing and faulting from the
23 Paleozoic up to the Wabiskaw D level. This is a
24 consistent story in the wells of the KN06 box and the
25 KN06 area.

26 So Exhibit 29.01, PDF page 98, so it's page 12,

1 please. Thank you. Please and thank you.

2 The interpreted presence of faults is also
3 apparent from the oil water contact. We have
4 reproduced part of the structural cross sections
5 from Exhibit 29.01, W-W prime for the 1AA/06-01 well
6 and the 1A seventh -- 1AC/07-01, which are 241 metres
7 apart.

8 I would like to direct you to the left side of the
9 page where there is a dark blue/purple line
10 unconformity near the bottom. Notice the offset
11 between the two wells, which is 11.6 metres. You will
12 note that there's an offset all the way up to the top
13 of the -- of the -- of the Wabiskaw. If you look at
14 the right-hand log for the 06-01 well, about four
15 metres above the Paleozoic, above the blue/purple line,
16 you will see a dramatic increase in the resistivity
17 that signifies bitumen above and water below. This is
18 the oil water contact.

19 For the 07-01 well, we will see the oil water
20 contact on -- on the right-hand log chart. There is a
21 significant offset of the oil water contact which
22 roughly parallels the Paleozoic. The difference
23 between the oil water contact between the two wells
24 is 7.5 metres. This offset has occurred -- has had to
25 occur post oil migration and post biodegradation. The
26 oil water contact offset is also evident in other wells

1 in the KN06 area.

2 Could you go to page 13? We're looking at
3 Exhibit 30.02, PDF 124. Very good. Thank you.

4 The presence of a significant structural
5 dislocation between the 1AA/06-01 and the 1AC/07-01
6 well is also apparent from other evidence submitted by
7 CNRL. We have reproduced the seismic cross section
8 from W-W prime below. In the cross section, we can see
9 that -- the flexure in the Paleozoic that is between
10 AA/06-01 and AA/07-01.

11 Could we move on to page 14, Exhibit 53.02,
12 PDF 207.

13 Two core photos below from the 1AB/05-01 well
14 illustrates some key differences in the way that CNRL
15 calls the "Post B2 Non-Reservoir", what I interpret as
16 IHS. If you look at the bottom column, you will note
17 that they have labelled "Top of Post B2 reservoir"
18 [sic]. It is at the top of the -- it is at the top of
19 what is predominantly sandy -- sand. I would refer to
20 these as "Sandy IHS".

21 So page 15, Exhibit 53.02, PDF 208. Moving to the
22 next core photo from the 1AB/05-01 well and down
23 through the stratigraphic column deeper into the
24 reservoir, you will see that CNRL places the top
25 reservoir at the top of the third column.

26 In the third column from the top, you can see

1 the -- what they call a post -- pardon me. In the
2 third column from the top, one, two, three, you can see
3 that they've placed the bottom of what they call the
4 "Post Non-reservoir". So that's actually what I'm
5 pointing to right there, and then the top is just
6 immediately below that. So they consider this
7 reservoir and this non-reservoir.

8 You see that the strata consists of mudstone
9 interbedded within sandstone which, again, I would
10 refer to as "IHS". I would refer to the entire core in
11 this photo as "IHS".

12 Moving on to page 16, Exhibit 53.02, PDF 135.
13 Moving to the next core photo, which is from the
14 1AA/11-01 well. You will see in the third column from
15 the bottom that CNRL has marked what they called the
16 "Regional Lower B1 Sequence". Moving up the columns
17 and the wellbore, you will see that it is interbedded
18 thick sands and thin mudstones. In my opinion, it is
19 highly unlikely that this -- these thin interbedded
20 mudstones can act as a barrier.

21 Page 17, Exhibit 53.02, PDF 92. Moving to what
22 CNRL calls the "Regional B1 Mudstone", what -- and
23 which I will call the "B1 Mudstone", you will note that
24 the -- that CNRL has marked the bottom and top of the
25 unit in the lowest column in the photo below from the
26 1AA/07-01 well. You will note that it is 15 centimetres

1 thick. Could you raise it just a little bit, and we'll
2 see the scale. The scale is along the bottom, and it's
3 marked off in centimetres.

4 Looking again at the lowest column, below the
5 B1 mudstone, this is the -- what ISH -- CNRL considers
6 the base of the B1 mudstone. Below the B1 mudstone to
7 the bottom of the core, you will note there is a
8 vertical fracture network coming through the core. You
9 will -- I'll show you what this looks like at the
10 bottom of the core, and I will also show you -- you
11 will also notice in some of the fractures are sand
12 fill. They're small vertical lines that disrupt
13 the stratigraphy of the core.

14 So there are a number of these. And on the third
15 one, it's -- you can see one down here.

16 Page 18, Exhibit 53.02, PDF 300. I would like to
17 move next to the 1AB/09-01 well, what CRNL -- CNRL
18 calls the "Regional Upper B1 Sequence." This -- in the
19 third column from the bottom, you will notice the sharp
20 contact marked in red for what CNRL terms the "Upper B1
21 Mudstone and Sequence" and the "Middle B1 Mudstone,"
22 which I call the "B1 Mudstone." You'll notice that the
23 B1 is very thin in this well, about 15 centimetres.
24 And if we could move it up just a touch. So it's --
25 from there to there would be 15 centimetres -- oh,
26 can't see it 'cause I don't have the arrow on -- and

1 has been fractured as is evident by the changed colours
2 between light grey and medium grey silty mudstones.
3 Notice the thickly interbedded sands and mudstones of
4 the regional B1 that directly overlie the middle B1
5 mudstone.

6 And finally, page 19, Exhibit 53.02, PDF 133.
7 Finally, I would like to direct your attention back to
8 the AA/11-01-75-9 well, which is located in the
9 KN06 box. You will notice the sharp erosional contact
10 between the Wabiskaw D and the top of the underlying
11 A1 -- actually, A2 mudstone marked in -- in the second
12 column of the top. So CNRL calls it the "top of A2
13 mudstone." In the -- in the third column from the top
14 is marked in red what it is believed what -- CNRL has
15 marked in red what it believes is the bottom of the A2
16 mudstone. I take issue where they have marked it "A2
17 mudstone." I would place the bottom of the A2 about
18 10 centimetres above where CNRL has placed it, in the
19 third column, based on the presence of sandy interbeds.
20 This would place the A2 mudstone at a total thickness
21 of 25 centimetres at the 11-01 well. Also notice the
22 same -- in the same third column from the top, right
23 underneath the mudstone, is what looks like a series of
24 small fractures. This section of core is highly
25 anomalous and -- just note this contact and also there.
26 That's my direct. Thank you.

1 MR. VERMEULEN: All right. I will continue on
2 with the geophysics. If we could get that same
3 document -- get that same document up to page 21, and I
4 just want to figure out how to do the annotation before
5 I start here. All right. I think I've got it.

6 All right. Good afternoon, Panel. My name is
7 Peter Vermeulen, and I'm a geophysicist. I have been
8 retained by ISH to review the seismic data submitted by
9 CNRL in this proceeding. I concluded that CNRL's
10 seismic review only investigated the presence of very
11 large-scale faulting and/or major collapse due to salt
12 dissolution. The core and log evidence within Kirby
13 show that faulting and fracturing within the confining
14 strata are expressed at a much smaller scale. Detailed
15 seismic analysis capable of measuring small-scale
16 changes in seismic waveforms were not provided within
17 CNRL's evidence. ISH noted this in their response to
18 CNRL's evidence and requested CNRL provide ISH with the
19 seismic volumes to conduct their own independent
20 analysis. CNRL declined to provide ISH with any
21 further seismic analysis nor the seismic data and
22 instead responded with the same seismic evidence that
23 was derived from an alternately processed seismic
24 volume.

25 Some of the advanced seismic analysis CNRL could
26 have provided to strengthen their position on fractures

1 and faulting would include horizon amplitudes, horizon
2 and zone attributes, a collection of semblance slices,
3 frequency decomposition, pre-stack gather analysis,
4 inversions, and seismically derived geomechanical
5 properties.

6 Also, I noted a single semblance slice at the
7 Mid-B1 mudstone level in the evidence that CNRL
8 provided ISH. This semblance slice is reproduced here
9 on page 21, which is on your screen. It is Exhibit 30.02,
10 PDF 120. So this semblance slice is reproduced here
11 and by itself demonstrates a piece of seismic evidence
12 that leaves the interpreter with more questions than
13 answers.

14 There are several linear trending dissimilarity
15 anomalies within and beside the KN06 drainage box as
16 highlighted by these black lines that I'm drawing
17 overtop of them, a few. Some of these anomalies appear
18 to be supportable with geological cross sections and
19 core evidence of faulting fractures.

20 A further review of semblance slices above and
21 below the mid one -- Mid-B1 mudstone level would be the
22 first step to determine if or how faulting propagates
23 through the semblance volume. CNRL did not provide
24 additional semblance slices in their evidence.

25 That's all I have, and I'm going to pass it over
26 to David now.

1 MR. LEECH: Good afternoon. Am I on?

2 THE CHAIR: Yes, you are.

3 MR. LEECH: Oh, get it in my ear.

4 Good afternoon, Panel. My name is David Leech,
5 and I was retained by ISH to assist in an investigation
6 regarding anomalous bottomhole pressure data observed
7 in the gas over bitumen pool. My review focused on the
8 10-01 well.

9 I've concluded that GOB gas has been flowing
10 around or through the 10-01 perforations. I believe
11 that the most likely scenario involves gas channelling
12 behind 10-01 casing up hole to the Upper Manville HH
13 formation which has two ISH wells producing. I believe
14 that this is the most probable case given the apparent
15 correlation of 16-35 production data to 10-01 pressure
16 data.

17 I'm confident that the 10-01 well has been flowing
18 because of a sudden drawdown pressure event on
19 November 5th, 2019, which triggered a liquid unloading
20 event followed by a Joule-Thomson cooling event.

21 I understand from my review of Exhibit 48.02 in
22 this proceeding that CNRL is suggesting that the sudden
23 change in 10-01 pressure on January 7th, 2020, came
24 from an ISH shutdown of a well located at 10-34 about
25 2,200 metres away. I am of the view that the hard
26 shutdown on January 7th, 2020, had to come from 10-01

1 or in very close proximity to 10-01.

2 This was an instantaneous hard shutdown. A
3 shutdown from 2,200 metres away would not have had such
4 an instantaneous effect at the 10-01 bottomhole
5 pressure gauge.

6 Moreover, 10-34 was presumably shut in sometime
7 before January 5th, 2020, whereas 10-01 final shut-in
8 event was on January 7th, 2020.

9 MS. GIRY: Thank you, David.

10 I would like to conclude by outlining how
11 difficult this proceeding has been for ISH. We began
12 this appeal because we were concerned about the
13 potential impacts on our GOB resources by CNRL's
14 operations in the KN06 box.

15 As we have gathered more information through this
16 appeal process, we have become increasingly concerned,
17 given the data which shows the lack of a barrier,
18 widespread fractures, faulting in the area around the
19 KN06 box, and the well integrity issue.

20 We are aware that we are a tiny company with few
21 resources compared to CNRL. We understand that CNRL
22 has a right to develop its bitumen resources. However,
23 it needs to do so by taking reasonable steps to ensure
24 that our gas resources are preserved for ISH to
25 produce. It should not be permitted to behave as if
26 the geological facts around the KN06 box do not exist

1 and SAGD operations at KN06 would have no impact.

2 There have been arguments put forth by CNRL that
3 the value of the resources in the GOB zone do not
4 justify the cost to ensure the steam chamber is
5 contained. But while the value of the resources may be
6 small to CNRL, they are significant to ISH. CNRL
7 should not be permitted to avoid the steps taken by
8 other SAGD operators to protect GOB resources on the
9 grounds that the resources that belong to parties like
10 ISH are of little value to CNRL.

11 It is the AER's mandate to avoid wasteful
12 operations of oil and gas resources and to protect
13 ISH's opportunity to obtain production of its gas.
14 Allowing CNRL's operation to sour ISH's gas is contrary
15 to the AER fulfilling its mandate. ISH also notes that
16 this argument about valuation in the end amounts to a
17 commercial issue between ISH and CNRL.

18 We thank you for hearing this appeal and look
19 forward to answering your questions.

20 MS. BERG: Madam Chair, the ISH panel is
21 ready for questions.

22 THE CHAIR: Thank you, Ms. Berg.

23 And I will have to say that for our first shot at
24 electronic hearing we're just about bang on, our time
25 estimate. Well done, everyone.

26 So I think now would be a good time to take a

1 break. Everybody get away from the screen, especially
2 our court reporter. I think we're scheduled to break
3 until 3:30. So I'll just remind the ISH Energy
4 witnesses that you can confer among yourselves, but you
5 may not confer with counsel or anyone who's not on your
6 witness panel.

7 Mr. Zaitlin and Ms. McKinnon, I think if we exit
8 to our breakout room, and then we will rejoin you all
9 back here at 3:30.

10 (ADJOURNMENT)

11 THE CHAIR: Ms. Jamieson, whenever you're
12 ready, you can proceed.

13 MS. JAMIESON: Thank you, Madam Chair and
14 Panel members.

15 I would just like to make note of the time and ask
16 a question. I see we're allocated two hours to
17 cross-examine. I think we're going to need that time.
18 Do we still get the full two hours since we're five or
19 six minutes starting late?

20 THE CHAIR: I want to say we were all back
21 in the hearing room at 3:30.

22 MS. JAMIESON: We didn't receive the
23 invitation to come back until just shortly, so I don't
24 know -- there must be a lag.

25 THE CHAIR: Maybe so.

26 Well, let's see where we get to. There's a

1 variety of factors relating to the time, but let's see
2 where we're at at 5:30. And if you're still -- have
3 more questioning, maybe we'll just stop and see how
4 much more and then make the decision then.

5 MS. JAMIESON: Okay. Thank you very much.

6 Ms. Jamieson Cross-examines ISH Energy Ltd.

7 Q MS. JAMIESON: Okay. Good afternoon,
8 Mr. Mathison.

9 I'd like to start with a few questions for you,
10 and I believe I followed Ms. Berg's outline at the
11 beginning in terms of your -- the evidence that you
12 will speak to, but if I, for any reason, get into an
13 area that you're not prepared to speak to, then if you
14 could just kindly let me know that.

15 So, Mr. Mathison, I noticed from your curriculum
16 vitae that you participated in the gas over bitumen
17 hearings back in 2004, 2005, as an expert witnesses.
18 Is that correct?

19 A MR. MATHISON: That's correct.

20 Q And so you would be familiar with the 2003 regional
21 geologic study?

22 A That is correct.

23 Q In fact, you wrote a paper about the same time. It's
24 titled "Sequence Stratigraphic Architecture of the
25 McMurray Formation" that Canadian Natural referenced in
26 its materials. Do you recall?

1 A That's correct. Actually, it was done six months
2 earlier prior to the RGS paper.

3 Q Okay. Thank you.

4 So just chronologically that takes us to about
5 2003. In the last ten years or so, do you have any
6 direct experience working for industry in the
7 McMurray-Wabiskaw reservoir?

8 A Let me see. Not -- not directly other than this --
9 this work that I've done for ISH.

10 Q Okay. Thank you.

11 And what about any experience just with SAGD
12 operations in -- you know, in respect of looking at
13 temperature data and characteristics of the vertical
14 position of the steam chamber? Any experience along
15 those lines?

16 A Yes. Yes, I have. I've -- I've actually worked on --
17 on three thermal projects beginning in 1984, and I
18 worked closely with the engineers to -- to help to
19 define the fluid motion, the -- the steam penetration
20 into the reservoir. That was at Fort Kent, a thermal
21 project with Suncor.

22 And then in '98, I worked on the Bolney project,
23 which is in Saskatchewan. It's in upper -- Upper
24 Mannville. It's actually at top of the Mannville.

25 And, again, I worked with the engineers on that on
26 trying to understand and understand both the placement

1 of the wells, the development of the pool, and any --
2 any -- the influence of any barriers to steam flow
3 and -- and steam propagation in the reservoir.

4 Q Thank you.

5 And can you recall what data --

6 A I'm not --

7 Q -- set you might've use --

8 A I'm -- I'm not quite -- I'm not quite finished.

9 Q Sorry.

10 A -- yet with the -- and then I've worked recently as
11 late as 2014 with Northern Blizzard, and I've worked
12 with the engineers to understand the -- the extent of
13 barriers and baffles within the reservoirs of the north
14 of their Kerrobert valley fill and to -- and -- and
15 then to develop operations -- worked around to how
16 to -- how to work around these issues.

17 So I have --

18 Q Thank you.

19 A We used -- yeah.

20 To anticipate, I've looked at temperature. In
21 fact, in -- we had -- we'd -- we'd do temperature
22 measurements at Fort Kent, and we could demonstrate
23 there that there was a cemented horizon that was
24 locally within the reservoir. It was not able to
25 transmit steam. Of course, there we have deviated
26 wells, so all you did was put -- put in some more

1 perfs [phonetic].

2 And then I worked -- and, sorry, what other
3 information are you -- would you like me to --

4 Q Oh, that's all I need. Thank you.

5 MS. JAMIESON: I'd actually like to pull up
6 an exhibit now, if I could, Ms. Turner. I'm not sure
7 who's running the exhibits, but Exhibit 65.01. This
8 was Canadian Natural's response to the AER's
9 information request.

10 A MR. MATHISON: Right.

11 Q MS. JAMIESON: I'd like to go to Tab 2, which
12 is page 30 of 45. Do you recall this? Have you --

13 A Oh, I --

14 Q -- reviewed this?

15 A -- do, indeed.

16 Q Okay. So let's see if we can move through this. So
17 this is ISH's regional strat chart on the right and
18 compared to Canadian Natural's strat chart in the
19 middle, Figure B.

20 A Could I correct you? That is not on the right. It
21 is -- that is taken from my paper. That is not ISH's.

22 Q Okay. So let's start on the left. Sorry. I might've
23 misspoke.

24 A Oh, okay. Okay.

25 Q Figure A.

26 A That's okay. That's fine.

1 Q All right.

2 A Yeah. Figure A.

3 Q Sorry.

4 A My -- my apologies.

5 Q Figure A.

6 THE CHAIR: Sorry. I'm just going to
7 interrupt for a minute. I don't see our court reporter
8 on screen, and I'm getting -- oh, there she is. And
9 I'm getting an echo and a ringing.

10 So, Sarah, are you able to hear clearly enough?

11 THE COURT REPORTER: I can hear, yeah. I hear the
12 same echo and ringing, but I can still hear.

13 THE CHAIR: And, Ms. Jamieson, have you
14 got -- you've got one person in the room with you.
15 Have you all got -- I'm wondering if the problem is if
16 we've got multiple speakers or mics on listening at the
17 same time.

18 MS. JAMIESON: No. I'm getting -- I'm the
19 only one that is audio right now.

20 THE CHAIR: Okay.

21 MS. JAMIESON: I don't think it's coming from
22 us.

23 THE CHAIR: Okay. Actually, right this
24 minute with your speaking then, it's fine, and it's
25 gone. So I guess let's carry on.

26 MS. TURNER: Excuse me, Madam Chair. It

1 perhaps happens when people are trying to -- are
2 speaking over each other. So maybe just give a bit
3 more of a pause.

4 MS. JAMIESON: Okay. We can try that. Thank
5 you.

6 Q MS. JAMIESON: So -- okay. I'll slow this
7 down, Mr. Mathison, just so you and I are on the same
8 page. I think that's --

9 A MR. MATHISON: Sure. Sure.

10 Q -- important.

11 So I may have misspoke. Figure A on the left-hand
12 side of the screen --

13 A Right.

14 Q -- that was taken from ISH's reply submission,
15 Figure 1. Do you agree?

16 A Yes, I agree.

17 Q Okay. Thank you.

18 And in the middle is Canadian Natural's
19 interpretation of the stratigraphic position of the
20 KN06 reservoir.

21 A I agree.

22 Q And on the right -- okay. And on the right is
23 Figure C, which is an excerpt from your Figure 6 of
24 your 2003 paper; correct?

25 A That's correct.

26 Q And do you agree that these are fair depictions of the

1 information from the ISH strat chart as well as your
2 paper?

3 A From the ISH strat chart -- now, I'm not really sure of
4 the question, that -- do I agree that -- that it's --
5 my stratigraphy is in agreement with what ISH's
6 nomenclature is? Is that the --

7 Q Well, we're going to --

8 A -- question?

9 Q -- get to that. Oh, sorry. Yeah. I'll ask the
10 question. I just wanted to make sure that you thought
11 it was a fair representation.

12 A I agree.

13 Q And you -- okay. So let's go to -- Figure A shows the
14 red circle, and it reads "McMurray B2"; correct?

15 A That is correct.

16 Q And so just on -- so we are on the same page. Do you
17 recognize that what ISH is calling the McMurray B2 on
18 its chart, Canadian Natural is calling the lower B1
19 regional unit?

20 A I do, indeed.

21 Q All right. And then Canadian Natural has a couple of
22 arrows on its Figure B. They're blue. And the first
23 one shows -- well, first of all, do you agree that the
24 lowest of the second, like, on the bottom is an
25 accurate placement for the location of the B2 mudstone
26 at the base of the regional B2 sequence?

1 A Based on the RGS's terminology, that is correct. Well,
2 it's not what I would call it, but it is correct for
3 the RG -- RGS terminology.

4 Q Okay. Thank you.

5 Do you agree that the log signature in your
6 published paper is identical to what Canadian Natural
7 correlates?

8 A It is the same unit. Yes, I agree. And these --
9 you'll notice also that this was an older terminology
10 that was used prior to the RGS.

11 Q Sorry. Oh, because -- you're saying because you
12 published it six months prior? Is that what you mean?

13 A That's correct.

14 Q Okay. But the blue -- can we just confirm, though,
15 that the blue in that depiction, Figure 6, confirms the
16 B2, correct, the McMurray B2?

17 A According to the RGS's terminology, yes. I agree.

18 Q Okay. All right. I think we're -- I think we're still
19 on the same page. That's good.

20 So, now, do you -- you also agree that the upper
21 arrow is an accurate placement for the location of the
22 base of the regional B1 sequence which also agrees with
23 your published correlation?

24 A I agree that what they term the "lower B1 unit" is the
25 same as what I refer to as the "B2," and they are
26 identical. It's just a difference in terminology, and

1 it is -- it is -- it is that -- the terminology used by
2 CNRL is consistent with the RGS terminology.

3 Q Okay. Thank you.

4 Okay. So let's start with that. Your evidence is
5 the terminology used by Canadian Natural is, in fact,
6 the same as 2003 RGS. Okay.

7 So is that -- is it the case -- would you agree
8 that it follows that the location of the McMurray B2 on
9 ISH's strat chart is incorrect, then, and not
10 plausible?

11 A No. I do not agree with that. It's just a difference
12 in nomenclature, and if you would just take -- if you
13 want to use my nomenclature, just replace the B2 -- or,
14 yeah, the B2 regional units, what they have red, in
15 blue -- thanks for colour-coding these in the -- in
16 the -- in the same way they were named in -- in my
17 earlier paper.

18 The blue is equivalent to what I would consider to
19 be the McMurray C, and there -- and so what I consider
20 to be the McMurray C mudstone would be equivalent to
21 the B2 mudstone. So, essentially, if you take where
22 they've got B2 regional and just change that to
23 McMurray C, that would be identical. So it's just a
24 nomenclature issue.

25 Q Okay. So, Mr. Mathison, I don't -- I don't think we're
26 going to agree on that, but I do have one more question

1 for you, and this is just more general.

2 So would you agree with me that an incomplete
3 understanding of regional stratigraphy sedimentation
4 just generally would lead to improper correlations and
5 interpretations by ISH?

6 A No, not at all. What -- in -- my 2003 paper, if
7 anybody's read it, has -- I never identify a B2
8 mudstone in it. What -- what I was identifying
9 were unconformity surfaces that -- that I could trace
10 through the -- throughout the McMurray area. And we
11 covered a very large area. Many, many townships.
12 And -- and this was -- this was -- this was applicable
13 throughout that area.

14 The other thing is -- so -- so I did not -- what
15 they say, this is not the B2 mudstone in green. I
16 never said was, if you look at the paper. That's where
17 the unconformity is. And both ISH -- both CNRL and I,
18 as well as ISH, agree that there is an unconformity at
19 the top of what they call a B2 regional sequence.

20 For clarity, I am willing to use the terminology
21 of -- of CNRL. To me, the terms, what you call it, is
22 not important. The reason I separated it out is in
23 classical sequence stratigraphy, you don't take a name
24 up above an unconformity. There is a large time gap
25 between the B1 and the -- and what ISH is -- CNRL is
26 calling "B2." To call them -- use the same terminology

1 is very -- to me more confusing than naming it a
2 different unit.

3 Q Okay. One last question, and I am getting out of my
4 depth here, Mr. Mathison. But just so that I am clear
5 on your evidence, when I look over at Figure C and what
6 Canadian Natural's identified as "blue B2" --

7 A M-hm.

8 Q -- you're calling the "McMurray C"?

9 A That's correct.

10 Q Have I got that right? Okay.

11 And then where Canadian Natural -- like, now on
12 Figure B, where -- so looking at Figure B, where
13 Canadian Natural says this is not the B2 mudstone --

14 A Yes.

15 Q -- do you agree with that?

16 A Well, it is the B2 mudstone as defined by the RGS
17 and -- and used by CNRL, but in my paper and as we have
18 used it, it would be called the McMurray C mudstone.

19 It's -- and it's just merely a different naming.

20 It's -- it's just nomenclature.

21 Q That continues to confuse me, Mr. Mathison --

22 A Okay.

23 Q -- because on Figure A, that McMurray B2 -- like,
24 McMurray B2 shows up and McMurray C shows up, but if I
25 followed you correctly, you would have the McMurray B2
26 come down with your McMurray C.

1 A Yes. And that's -- that is consistent, actually, with
2 what -- what CNRL is -- is -- is naming it. They call
3 it the "post B2 reservoir unit," and that unit is cut
4 into the regional stratigraphy which includes the --
5 the -- what I call the "McMurray C," what -- what CNRL
6 calls the "B2 regional." It cuts -- cuts right through
7 that. And -- and at the base of that is a regionally
8 persistent mudstone flooding event that I call
9 "McMurray C;" CNRL calls "B2." It's -- we're -- we're
10 not in disagreement at all with the regional
11 stratigraphy. It's just the naming. The --

12 Q Okay.

13 A Yeah.

14 Q Okay. But I just -- just from a basic logic
15 perspective, so not geology, but what I thought I heard
16 you say was that the McMurray B2 would be down on --
17 sorry. On Figure A, the McMurray B2 would be down
18 there with the McMurray C where it's placed on there
19 which would, in fact, make ISH's strat chart incorrect.
20 Do you agree?

21 A No, I would not. No, I would not. I think that's a
22 misinterpretation. What's -- there is -- the B2, what
23 I call "B2 valley fill," truncates all of the regional
24 strata and so is equivalent to -- and I don't think
25 there's any disagreement between myself and CNRL -- is
26 equivalent to that unconformity that I was the first

1 to -- actually, to recognize at the -- at the -- the --
2 the boundary between the B1 and B2 in CNRL's
3 terminology.

4 Q Okay. Thank you, Mr. Mathison. Let's leave that line
5 there 'cause I don't think it's -- would be any more
6 fruitful.

7 I'd like to understand a little bit about your
8 evidence on the A2 mudstone.

9 A Sure.

10 Q Do we agree that the A2 is recognized as a seal that --
11 the A2 regional mudstone is recognized as a seal? Do
12 you agree?

13 A According to the RGS finding, yes, it is a very
14 persistent mudstone. It's -- it's very easily mapped.
15 It's readily mappable. It can be thin, though.
16 That's -- that is an issue, so that -- that could be an
17 issue. But its characteristics, it's a silty bio --
18 highly bioturbated silty mudstone. So from those
19 characteristics, where it's present and -- and thick
20 enough, it should act as a barrier.

21 Q Okay. Thank you.

22 So on page -- so this is 35 of your opening
23 statement, and I don't think we need to bring it up.
24 But you made a statement. You said: (as read)

25 The parties agree that the [A2 mudstone] is
26 completely absent from the northwest corner

1 of the KN06 box.

2 Do you recall making that statement?

3 A Well, I guess it's -- it's -- it is absent over a
4 portion of the northwest box, KN06 box, and I don't
5 think there's any agreement. Both of our maps show
6 that. We agree that it's missing in -- in the same
7 wells. In fact, even the numbers we're using are very,
8 very, very similar. The difference that we have is
9 that we think that -- I would argue that the way it has
10 been contoured by CNRL would actually indicate that it
11 was of -- of greater -- greater extent than it actually
12 is, that the zero zero value that -- in the 186 of 11-1
13 well, right at the north corner of the pool, is a zero
14 value, yet that's -- which means it -- it is actually
15 not absent as opposed to the zero edge because we
16 don't -- there's no -- it's not present in that well.

17 So it's -- it's just a matter of contouring
18 option, if you -- if you will, how you contour that.
19 And I think what CNRL has -- has done is they've pushed
20 it as far out as possible. I would say it's probably
21 less, you know, and I think it makes more sense, our
22 contouring, which is Figure 4 of -- could you get me
23 a -- 63.09, Figure -- and what's the PDF? Do we have a
24 PDF number? Oh, PDF 14 of 63.01.

25 MS. TURNER: Sorry, Madam Chair.

26 Mr. Mathison, who were you conferring with?

1 MR. MATHISON: Oh, my -- my apologies. I was
2 conferring with --

3 MR. LEWIS: Sorry. He was asking me for
4 the PDF number for one of our maps, which I
5 mentioned -- yeah.

6 MS. TURNER: So that's Mr. -- just for the
7 record, that's Mr. Lewis.

8 MR. LEWIS: Yes. Owen -- Owen Lewis.
9 Mr. Owen --

10 Q MS. JAMIESON: Mr. Mathison, I don't have any
11 further questions on the A2 mudstone.

12 If we could move on, I'd like to talk to you about
13 the Mid-B1 mudstone now. Is that okay?

14 A MR. MATHISON: Certainly.

15 Q Okay. Thank you.

16 And, again, we don't need to bring this up, but
17 there is a statement in ISH's reply submission with
18 respect to the B1 mudstone, and it states: (as read)

19 The B1 mudstone is a thin but regionally
20 extensive silty, sandy mudstone similar to
21 the McMurray A2 mudstone.

22 Do you agree?

23 A I agree that it is thin. It is silty,
24 highly bioturbated mudstone. Very recognizable.
25 Regionally mappable, I agree. But in the KN06 box, I
26 do not agree that it is present throughout.

1 Q Understood.

2 The words "similar to the McMurray A2 mudstone",
3 do you mean that where it's present, the B1 mudstone
4 would be effective as a barrier to steam in the same
5 way that A2 mudstone would?

6 A Provided it's thick enough, yes, and -- and present
7 throughout the steam flood area and not breached by a
8 later fracturing or faulting.

9 Q All right. Okay.

10 So I don't have your exact words, but I do recall
11 in your opening statement that you were acknowledging
12 that the B1 mudstone is present over the KN06; correct?

13 A If we can go to my -- now, I'm going to confer with
14 Mr. Lewis, the map of the B2 -- B1 mudstone.

15 MR. LEWIS: Sure. Just a second. That is
16 in PDF -- no. Sorry. That's in 63.01, PDF 12. Sorry?

17 A MR. MATHISON: Let me talk with the --

18 MR. LEWIS: Oh, okay. Yeah. So that is
19 in 63.01, PDF 12, I believe, is that map, Figure 3.

20 MS. JAMIESON: Yes. Page 12, Figure 3. Yes,
21 I think that's right.

22 MR. CAMPBELL: Do you mean 63.02?

23 MR. LEWIS: I have it up at 63.01 here.

24 MR. CAMPBELL: I have -- sorry. We may have
25 cross documents here. I have --

26 MR. LEWIS: No, it's all right.

1 MR. CAMPBELL; -- 3.02 as the ISH reply
2 submission.

3 MS. JAMIESON: Yes. I believe that's the
4 right document, and the question might be whether or
5 not -- it might be 63.02 if the cover letter was given
6 63.01.

7 MR. CAMPBELL: Yes. The cover letter --

8 MS. JAMIESON: That might be --

9 MR. CAMPBELL: -- is 63.01. Okay.

10 MS. JAMIESON: Yeah.

11 MR. CAMPBELL: Sorry. And the page number,
12 sorry, was 12?

13 MS. JAMIESON: We're looking at page 12 of
14 the PDF.

15 MR. LEWIS: Yes. With the Figure 3
16 McMurray B1 mudstone isopach map, I think, yes.

17 Q MS. JAMIESON: And, sir, are you agreeing
18 with this? This is your isopach map?

19 A MR. MATHISON: I'm agreeing that it was done
20 under my supervision, and I'm agreeing -- in agreement
21 with it.

22 Q Okay. So if we could, I would like to go to one of the
23 aids in cross-examination that we filed prior to.

24 MS. JAMIESON: Ms. Turner, this would be
25 Number 1, and this is an annotation of the earlier
26 depiction. So I'd like to have it marked as an

1 exhibit, if we could, please.

2 MS. BERG: If we could mark it as an
3 exhibit for identification at the moment, and let's see
4 what he has to say about it, if that's all right.

5 MS. JAMIESON: Yeah. That's fine with me.

6 THE CHAIR: And, sorry, is this one of
7 the -- we -- the Panel received three documents earlier
8 that were identified as aids to questioning. Is what
9 you're referring to now one of those, or is this
10 something different?

11 MS. JAMIESON: No. Yes, it is. It's the
12 first one.

13 THE CHAIR: Okay.

14 MS. JAMIESON: And the title would be
15 "Stratigraphic Interpretation of the Upper McMurray".

16 THE CHAIR: Okay. I thought that's what
17 we were looking at the first -- the -- your very
18 first --

19 MS. JAMIESON: It is, but this one has been
20 annotated just to try to facilitate the question.

21 THE CHAIR: Okay. Thank you.

22 Q MS. JAMIESON: Okay. So just to orient you,
23 Mr. Mathison, if I could, this is the same
24 stratigraphic interpretation we were just discussing.

25 A MR. MATHISON: Yes.

26 Q I want you to focus in figure -- on Figure B, and we've

1 annotated with a round circle. It's blue, and it is on
2 the gamma log there on the left-hand side of Figure B.

3 A Yes.

4 Q All right. And just so that we're on the same page, do
5 you see the dash line going through the middle of the
6 blue circle?

7 A Yes, I do.

8 Q Okay. Do you acknowledge that that is what Canadian
9 Natural asserts is the Mid-B1 mudstone?

10 A Yes. And that's what I call the "B1 mudstone."

11 Q Okay. All right.

12 So the question is: Do you agree that the gamma
13 log indicates that the regional upper B1 sequence is
14 mudstone rich?

15 A In this well, it is. Yes.

16 Q And could -- this mudstone-rich area within the
17 regional upper B1 sequence over the KN06 box, could
18 that result in a misinterpretation that the Mid-B1
19 mudstone has been removed?

20 A Not in this well. I think that it's -- usually, the --
21 the -- both the A1 or the A2 mudstone and the Mid-B1
22 come through as a high gamma ray pick, and it's -- it's
23 pretty obvious. And -- and where you lose that
24 character, you have to question yourself of whether
25 that is there or not, and so it's not related to the
26 overlying strata. It's more a matter of the actual

1 character on the well log.

2 So once -- you know, the -- the question, of
3 course, is: What's causing that? And you could get
4 thin-bed effect. That -- even -- even when you get
5 down into the half metre or even less, it's still a
6 highly recognizable mudstone. And so I don't think
7 that would cause any -- I recognize that in certain
8 portions of the -- the KN06 area, the B1, the overlying
9 B1, upper B1, is a muddy unit, but as we go elsewhere,
10 it's also a sandy -- predominantly sandy unit.

11 Q I'm hoping to follow up. Are you speaking about the
12 uncertainty of the pick when you give that answer?

13 A Well, that's -- is that not what you asked me? Because
14 you mentioned that they said because it was -- it
15 was -- the upper B1 was predominantly muddy in this
16 well. Would that make -- not make you interpret
17 that -- that it was -- that the 'B' -- B1 mudstone,
18 Mid-B1 mudstone, was absent? And I -- to -- in reply
19 to that, I said I -- no, I do not believe that because
20 the reservoir -- or the log characteristics are quite
21 distinctive and distinctively different from the B1
22 mudstone -- or overlying B1.

23 Q Okay. I think I understood that. I think I have a
24 more basic question.

25 A Sure.

26 Q Do you agree that mud can act as a barrier?

1 A Yes. Yes. I'm --

2 Q All right.

3 A I'm not in disagreement, but these are mudstones.

4 Q Thank you.

5 A They're -- they're -- they're -- they're indurated, and
6 they can be broken and fractured. They're not just
7 simply muds. That's why we call them "mudstones".

8 Q Okay. Let's move forward, if we could. So here's
9 another statement. Actually, I think that in your
10 opening statement you spoke to the 12-01 well. So I
11 think we should -- actually, I'm going to leave those
12 questions for the moment.

13 I need to just talk to you generally about the
14 datum that you picked for identifying the depositions.
15 So my question is: Do you agree that a datum must be a
16 continuous unambiguous pick that was horizontal at the
17 time of deposition?

18 A I believe those are my words.

19 Q Those are not your words. I'm asking --

20 A Oh, they aren't?

21 Q -- if you agree --

22 A Well --

23 Q That's the --

24 A -- I certainly --

25 Q -- conclusion --

26 A -- agree with them. I absolutely --

1 Q Okay.

2 A -- agree with them.

3 Q Okay. Thank you.

4 Are you aware that the top Wabiskaw marker is
5 consistently chosen by operators to hang stratigraphic
6 sections from -- in this area to best allow them to
7 understand the regional upper McMurray stratigraphy?
8 Are you aware of that?

9 A I am aware of that, but I don't think that that
10 necessarily makes it the best pick. It depends on what
11 you're using it for.

12 And the reason we use the -- the B1 and Mid-B1
13 mudstone was -- for the most part, it can be correlated
14 in that area, and it's closer to the -- the actual
15 reservoir level. And, therefore, any -- if there's any
16 distortion structuring differential compaction and you
17 choose an overlying datum such as the -- you know, the
18 basic Clearwater or the top of the Wabiskaw, it's going
19 to -- going to distort your image of the -- the
20 stratigraphy.

21 You want to choose something that's as close to
22 the layers that you're interested in in order to --
23 to -- but that you're -- you're pretty confident was --
24 was a horizontal unit and can be picked with -- with a
25 great deal of certainty to avoid any distortion in the
26 data.

1 Q Right. And so it would follow, then, that if you pick
2 a poor datum or the datum's not verifiable, then that
3 creates uncertainty. Yes?

4 A That's true. And as I say, with the B2, there are
5 places where we interpret it. And -- and when we built
6 these first cross sections, I hadn't looked at -- at
7 much of -- any of the core, in fact.

8 And so what -- now, I wasn't aware at that time
9 that -- that I -- that the B1 -- or, yeah, that the B1
10 mudstone is absent over portions of -- of the pool.
11 But the -- the overlying B2, the base of the B2, acts
12 as a very good proxy, and it's a good pick also.

13 So we're not -- we're not distorting things too
14 much. You know, we're -- even if the B1 is absent in a
15 few wells. Because we're -- we're picking the top of
16 the B1, which is also coincident with the base of the
17 B1, upper B1, we're not actually causing any
18 distortion.

19 Q Okay. My understanding, then, is by using the top of
20 the Wabiskaw as the stratigraphic datum, then the
21 underlying A2 mudstone is --

22 A Yeah.

23 Q -- also flat relative to this datum and that that would
24 demonstrate that the effect of the Wabiskaw D
25 unconformity is negligible. Do you agree?

26 A I guess what are you referring to in the KN06 box? Are

1 you referring to the -- the larger KN06 area?

2 Q I think the large --

3 A Go ahead.

4 Q The larger KN06 area.

5 A Yeah. Well, now, if I understand your -- your question
6 correctly, the unconformity, which is the other one
7 that I identified in my paper, at the base of the
8 Wabiskaw is a very high -- has a high -- it's a -- it's
9 an unconformity that cuts all the way down in this
10 instance just north of the KN06 area -- I've lost your
11 feed -- in the KN06 area.

12 It actually truncates down to where it's
13 truncating regional strata as opposed to the post B2
14 reservoir unit. It truncates down all the way into
15 what -- what CNRL and the RGS would -- would call the
16 "McMurray C." So these channels can be up to well --
17 in the 11-02 well just to the north of it, which I had
18 in the core. It's -- it's actually 27 metres thick.

19 So -- so that -- there is a large amount of -- of
20 erosion at the base of the Wabiskaw B. And in -- in
21 the KN06 box, that takes away the entire upper A2
22 sequence and -- and down into the regional and removes
23 the regional A2 mudstone. So it's truncated all the
24 way down to the top of the B1.

25 Q So I'm confused by that 'cause I thought we already
26 established that the A2 mudstone is still present over

1 the KN06 except for the one -- a small portion based on
2 the one well in the northwest corner; right?

3 A It's not based on one well. It's based on the wells
4 also to the north with the 1AC. In fact, we can show
5 you -- I can show you the core in that 1AC/11-01 well
6 just on the northern border of the KN06 box. And I
7 can -- I think I can demonstrate -- yeah, demonstrate
8 that the A2 was not there, if you would like me to do.

9 Q I think just in the interest of time, keep moving
10 forward. I did file a second aid to cross-examination.
11 This was a paper that was referenced by ISH -- a 14
12 paper ISH -- referenced by ISH in -- by Jablonski, et
13 al., and I'd like to bring it up, if we could, and move
14 to the second page. Now -- yeah. I'll give that a
15 moment.

16 So, sir, we did highlight the yellow portion that
17 I would like to ask you about. But before we get
18 there, I believe the first sentence of the same
19 paragraph, so the third paragraph down, is the one that
20 ISH was referencing or using this paper for support.

21 So it's: (as read)

22 The initial analysis of this quantitative
23 data suggests that individual silt beds,
24 1-to-10 centimetres thick; millimetres
25 laminated to structureless; relatively low
26 permeability compared to the sand beds, at

1 selected outcrops, type section particularly,
2 are less continuous, less than 10 metre
3 lateral extent than originally thought before
4 undergoing the study.

5 So I believe that that's what the reference was based
6 on. Is that correct?

7 A That is correct.

8 Q All right. So we're talking now about the -- the post
9 B2 non-reservoir, and the concept is that, you know,
10 certainly, in Canadian Natural's view, that that
11 non-reservoir (INDISCERNIBLE), the interbedded -- or
12 the IHS, so the inclined heterolithic strata, at the
13 stop of the steam chamber can act as climate strata due
14 to its low permeability.

15 And we think that ISH didn't go far enough in
16 reviewing this reference because starting just above
17 the yellow highlighted statement -- and I'll ask your
18 thought about this, but it states: (as read)

19 Even though silt beds appear to be
20 discontinuous in the outcrop samples, it
21 appears that there are zones within the IHS
22 stratigraphy where silt beds are more
23 abundant. These zones vary in thickness, 50
24 to 200 centimetres in thickness, and are
25 laterally continuous across an entire outcrop
26 bowl and can often be traced for over a

1 hundred metres across numerous outcrop bowls.
2 The abundance of the silt beds and the
3 resulting complex tortuous permeability
4 pathways, due to the individual mud beds
5 within the zones, are laterally
6 discontinuous. It likely indicates that
7 these zones will be barriers to steam
8 chambers development and SAGD over the life
9 of a well-pair.

10 Can you please explain why you state the position that
11 the IHS will not act as an effective barrier.

12 A Okay. I can -- several lines of that notes to indicate
13 that -- that they probably are not barriers, at least
14 in portions of the reservoir. And if we could look at
15 the core from the A/11-01 well. Go down to the -- no.
16 That's -- okay. It's -- to eleven --

17 MR. LEWIS: I'll search for the --

18 Q MS. JAMIESON: Sorry. Mr. Mathison, maybe I
19 wasn't clear with my question, and I'm happy to look at
20 that core. But my question is just: Speaking in
21 general terms, do you agree that IHS can work as an
22 effective barrier to steam in this area even though
23 they're discontinuous? That's my question, and that's
24 what this abstract seems to indicate.

25 A MR. MATHISON: Well, I -- I -- first of all,
26 I think we have to understand we're looking at very

1 different -- different fish here. The outcrop samples
2 are from very large channels. The very large channels
3 have very -- have very -- the IHS is very thick, up to
4 17 metres, that -- in the Fustic paper.

5 You know, so we're looking at -- at -- at mudstone
6 intervals and beds because -- because they have --
7 typically have an 8-degree dip, and that's taken right
8 out of Fustic. Their lateral extent is -- is far
9 larger than we see in the IHS that we see overlying the
10 top of the B2 -- what they call the "B2 reservoir
11 unit." And so -- so that -- that's one thing.

12 And the other thing is that what is termed
13 "non-reservoir" -- and I would interpret as -- as --
14 in -- in -- I would interpret it actually as a
15 reservoir because it's -- it's -- it is sandy IHS even
16 though they have -- they have termed it as
17 "non-reservoir", and -- and -- you know, and -- and it
18 has significant thicknesses, and that's what I wish to
19 show you in the -- the AA/11-01 well, which is the --
20 the type well that -- that CNRL likes to present, and
21 it's the only well that they've presented any core or
22 well logs information on.

23 And -- and in that well, where they place the top
24 of the reservoir, there are clearly thick sandstone
25 beds, and these beds would be dipping at an 8-degree
26 angle. So these -- these sandstones would go from the

1 top of what they consider reservoir all the way up to
2 the top of the 'B' -- to the base of the overlying --
3 overlying what -- what they referred to as the "B1."

4 So, clearly, there are communication pathways, and
5 to use their Collins paper, the Collins paper that
6 they -- Collins, et al. paper, the 2001 paper, he
7 refers to this -- these as spill points where you have
8 inclined strata that has coarse -- both coarse-grained.
9 In this instance, sand and mudstone intervals can act
10 as spill points.

11 And so what I'm saying is there are spill points
12 within that KN06 area, and I can point to wells where
13 you have sandy strata that goes all the way up to just
14 below the -- or right up virtually to the top of the
15 'B' -- the -- just underlying the B1 unit. And, in
16 fact, in -- in the -- the modelling that CNRL did --
17 and it's -- excuse me. Can I confer with my
18 compatriots?

19 MS. TURNER: I understand Mr. Mathison is
20 conferring with Mr. Lewis for the record.

21 A MR. MATHISON: So it's PDF 0201.

22 Q MS. JAMIESON: Mr. Mathison, I'm growing
23 concerned about time, and I have a number of questions
24 I'd still like to answer, so I don't need to look at
25 that PDF.

26 A Okay.

1 Q I'm satisfied with your answer.

2 A Yeah.

3 Q And if I could ask you one last one on the confinement
4 strata --

5 A Sure.

6 Q -- I -- I have a few more I'd like to get to, if I
7 could. Thank you.

8 A Yeah.

9 Q So -- and this is a general -- I want us to just take a
10 step back. So I understand your evidence to say you're
11 finding fault with all three of these strata layers
12 that Canadian Natural's put forward. They're putting
13 it forward as a package. But if I understand your
14 evidence, you're saying, None of this is effective;
15 it's not going to work as a confinement strata. So I
16 want to understand how you can explain the literally
17 hundreds of wells in the Kirby area, the SAGD wells,
18 that have been successfully started up, and they're
19 operating without any loss of steam, with the same
20 confinement strata. So how does that go around with
21 your evidence, sir?

22 A Well, first of all, I'm not saying that those layers
23 always provide containment in -- you know, provided
24 they're continuous throughout the reservoir and have --
25 have a, you know, minimum thickness, whether it's a
26 half metre or a metre. What I'm -- so it doesn't meet

1 those criteria in the KN06 box. And that's the issue.
2 It's not what is happening next door but what is
3 happening in this box. And the -- the -- sorry. I've
4 lost my train of thought, but I will get it.

5 So we -- we can demonstrate or -- that -- that
6 these -- these strata are within the KN06 box. All of
7 those units are either largely sandy and -- and --
8 which would go all the way up to the -- you know,
9 let's -- for instance, the IHS, or the B1, the regional
10 B1, upper B1, and the lower B1, so within that box.
11 You know, we have mapped them out. I would map them
12 out if I was an operator. I would like to know.
13 I'm -- I'm actually going -- using a lot of things
14 from -- that -- that CNRL has -- has provided, and I
15 don't think that they've fully read them and -- and
16 taken it to heart and really tried to understand
17 that -- that IHS -- not calling it "IHS" but calling it
18 "non-reservoir" isn't good enough. You need to map out
19 which -- where are your sandy -- sandy IHS 'cause
20 that's a spill point according to Collins, or where in
21 the B1 -- the lower B1, where is it sandy versus
22 shaley? It's usually a sandy unit and -- and would --
23 would therefore be transmissible to steam. And --
24 and -- and, again, the B1, where it's very thin or
25 where it's fractured, we're looking at things that go
26 down to .1 metres, 10 centimetres. Now, it wouldn't

1 take much to break through that with steam. I don't
2 think you even need any fracture. And, again, we know
3 that the A2 has -- is truncated. It's eroded
4 completely at a small portion to the north.

5 So what -- what you can do is you may not get that
6 chamber rising up like a -- chambers don't rise up
7 vertically. If you have inclined strata, it will go up
8 that -- that inclined strata provided you've got a good
9 reservoir. And these -- every one of these units has
10 bitumen saturation. All of the sands in them are
11 bitumen-saturated. So it can get through any -- and as
12 long as it can -- it can encounter a sandy unit in the
13 overlying strata or a missing strata or fractures or
14 where it's very thin and can get through, it can break
15 through that barrier. So we can get spill points. I'm
16 saying it doesn't necessarily have to be vertical
17 propagation. I don't believe that that -- when you get
18 into this sort of strata, it's going to follow the
19 stratigraphy. And the stratigraphy is telling me that
20 there could be lines of communication and very probably
21 are.

22 Q Thank you, sir.

23 A You're welcome.

24 Q Again, in the interests of time, if I could move you
25 to -- I'd like to look at some of these -- what ISH is
26 alleging to be faults and fractures. Could we start

1 with Exhibit 63.01. It's ISH's reply submission.
2 Figure 6, page 17 of 102, I believe.

3 MR. CAMPBELL: So that is 63.02, page 17.

4 MS. JAMIESON: Yeah. So Figure 6 -- yeah.
5 Thank you, Mr. Campbell.

6 Q MS. JAMIESON: All right. Sir, so Figure 6,
7 I believe, was put forward by ISH to show wells where
8 cores -- it shows clear verticals of sub-vertical
9 fractures and faulting. Which of the faults and
10 fractures on the core photos referenced in this figure
11 are actually located in the KN06 box?

12 A MR. MATHISON: As it's very clear, there
13 are -- we didn't at that time have any -- any in that
14 area. We chose only to provide the -- what we thought
15 was the strongest evidence. Now, we have lots of
16 evidence in the KN06 box. In fact, I can -- I would be
17 willing to provide a list of -- of those wells and a
18 map such as this if you would -- would like to. If you
19 want me to go through which wells have it, I -- I'm
20 certainly willing to do that.

21 Q We just don't understand why they weren't shown in
22 evidence, sir, if you have --

23 A Well, first of all -- okay. We -- I actually -- it was
24 just a -- a mix-up and a timing issue. We had -- I
25 don't know what -- how many pages to go through here,
26 and I've gone through that -- and I've gone through

1 that, the core photographs, a number of times, and the
2 more you look at them, the more things you see.

3 And -- and especially on core photographs, it's
4 difficult to tell with actual certainty what you're
5 looking at. And so what we initially provided was what
6 we felt we had the -- the clearest evidence, and, in
7 fact, some of these we -- outside of the box, 15-02 is
8 probably one of the strongest cores. But within the
9 box, I've also shown you some evidence of -- of
10 fracturing in the AA/11-01 well, which is the -- the
11 well that CNRL always uses as their type well. And
12 I've also -- and 5 -- AB/05-01. So those are two I've
13 already presented to you. So -- but, as I say, we can
14 provide lots of evidence of faulting and fracturing
15 within that box, and we would be happy to provide a
16 list of those wells if you'd like.

17 Q Well, that's fine. I think we can just agree, though,
18 that the -- that the evidence of faults and fractures
19 over the KN06 box would be more relevant, correct --

20 A I --

21 Q -- to the proceeding?

22 A I agree with you, and I tried to get it in, but
23 unfortunately we were rushed with this, and we didn't
24 have that map prepared at the time, so ...

25 Q Okay. Thank you, sir.

26 And are you familiar, sir, with the difference

1 between drilling-induced fractures and natural
2 fractures?

3 A Absolutely, absolutely.

4 Q And is ISH really claiming that all the faults and
5 fractures that you're putting forward in all these
6 wells are natural as opposed to drilling-induced? Did
7 you see any sign of drilling-induced?

8 A Oh, yes. And I've -- I have edited out and tried to
9 stick to the ones that I felt had clear evidence.
10 Now -- and -- but sometimes it's very difficult to say
11 then -- and especially where you can see direct
12 evidence that there is some sort of -- there is
13 fracturing. And then above this, you see a -- an open
14 fracture, which you're -- you know, could -- could be
15 drilling-induced; it's hard to say. But it's -- the
16 weight of evidence would suggest that this is a
17 fracture related -- and I -- I've got examples where
18 you can see highly distorted strata. In fact, I showed
19 that, highly distorted strata, with an overlying
20 fracture coming up, vertical fracture. So we know that
21 they exist.

22 Now, not having the ability to actually look at
23 these in core makes it very difficult to say with any
24 certainty whether they're drilling-induced or whether
25 they're actually vertical fractures. Both would look
26 very similar in -- in core.

1 Q Well, I'm going to suggest, sir, that Canadian Natural
2 will speak to that in its evidence.

3 I'd like to understand if this concept that -- my
4 understanding is this, that a fault or a fracture needs
5 to be open and wide enough and sand-filled or permeable
6 in order to act as a conduit. So do you have any of
7 your fractures or faults that are actually of a
8 sufficient circumference -- or, first of all, let's
9 break this down. What circumference would you agree to
10 is required in order for a possible fracture or a fault
11 to start to act as a conduit?

12 A Well, first of all, what I would argue is I don't
13 believe that -- first of all, that this necessarily has
14 to be an open fracture that is, you know, wide enough
15 that you can get steam flow. What you need is a zone
16 of weakness, a zone that is broken. If the -- if
17 the -- the core has been broken or shattered -- and I
18 do see that in some instances -- then the -- the
19 pressure and the -- and the -- from the steam could
20 fracture that and induce -- and then would allow steam
21 to propagate up through that fracture system.

22 Q Okay. So let's just follow that along if I could, a
23 zone of weakness. How long would this zone of
24 weakness -- would you -- wouldn't it not -- would it
25 need to be -- or I'm going to suggest to you it would
26 need to be the length of the confinement strata in

1 order to actually act as a conduit; correct?

2 A No. It just needs to be enough to get one through,
3 let's say, the B1 mudstone. If that's the confining
4 strata over a portion of the field -- pool, then all it
5 needs is to be able to get up through that to access
6 the sand beds over -- overlying that. And once its --
7 once its accessed them, then it will expand from there
8 and -- and cause more -- open up that -- that line of
9 communication.

10 Q What about the ones that you feel you observed at
11 depth? Are they closed?

12 A No, they're not. Not all of them. If you recall back
13 to the 02-01 well -- the A/02-01 well, that's a
14 Paleozoic. That one I referred to as a fault. It's
15 open, and indeed it's -- it's -- you know, it's -- it
16 would be significant.

17 The other thing that -- you know, I -- there are
18 many lines of communication. Some of these fractures
19 have been cemented, and I agree those -- those would be
20 not lines of communication. But I've also seen wells
21 where these have actually been fractured also. So, you
22 know, I think, you know, we're -- the other thing is
23 we're -- these fracture systems or -- or faults, as I
24 would interpret them to be, are not a single, you know,
25 fault coming up that's, you know, 'X' metre -- 'X', you
26 know, centimetres wide. They are an array of

1 fractures, which means that any strata they go through
2 will have multiple penetration points, which would
3 certainly reduce the integrity of that layer, and
4 therefore the whole thing could break through.

5 Q Okay. Understood.

6 On the fault that you're just referencing, how
7 much offset are you seeing on that fault?

8 A We don't see -- we don't know. We can't match the --
9 the stratigraphy across. We don't see the other side.
10 It could be metres. It could be tens of metres. We
11 don't know. There's no way of telling from the -- the
12 core. If -- if CNRL can demonstrate it on seismic
13 and see it, that would be very, very, you know,
14 helpful.

15 Q Thank you, Mr. Mathison. I believe those are all my
16 questions for you.

17 Ms. Giry, I would like to speak with you if I
18 could next, and this is just with respect to Hearing
19 Issue 2, the risk of fractures. So, Ms. Giry, the
20 second hearing issue that was set by the panel is the
21 risk of fractures or other breach of the barrier/top
22 seal, if present, resulting from Canadian Natural's
23 operations in the KN06 box. And I have reviewed ISH's
24 submissions in this proceeding. I couldn't find a
25 clear statement as to what ISH believes the risk of
26 fracture to the containment strata is. Can you please

1 state that clearly now.

2 A MS. GIRY: So if I read again the
3 Issue 2: (as read)

4 The risk of fractures or other breach of the
5 barrier/top seal, if it is present, resulting
6 from CNRL operations in the KN06 box.

7 On top of the fractures and faults that were identified
8 by Mr. Mathison, we also looked at this other breach,
9 which is Well 10-01. Well 10-01, looking at the
10 pressure provided by CNRL, is clearly demonstrating a
11 compromised well.

12 Q All right. Thank you.

13 In addition to 10-01 -- the 10-01 alleged breach,
14 did you -- do you have a clear position on the risk of
15 fracture to the confinement strata from the KN06
16 operation? So there I'm talking about the start-up
17 pressure.

18 A Can you repeat your question. All I heard, "breach"
19 and then "start-up pressure."

20 Q What does ISH believe the risk to the confinement
21 strata is from the KN06 operation?

22 A The biggest risk is having 10-01 compromised.

23 Q Okay. Thank you.

24 Did ISH retain a geomechanical expert to evaluate
25 the risk on Hearing Issue Number 2?

26 A We looked at fault and fracture with the review done by

1 Ed Mathison. We definitely looked at the pressures
2 provided by CNRL on 10-01, and we understand
3 geomechanics from an engineering level.

4 Q From an engineering level. Okay.

5 And was any analytical or quantitative assessment
6 performed?

7 A We trust that CNRL, being the operator, would provide
8 us with sufficient information on this simulation. We
9 were provided with a geomechanical simulation performed
10 by CNRL. We reviewed that geomechanical model. And
11 that's my one -- my answer, I guess.

12 Q Thank you.

13 I'd like to just talk briefly about the field data
14 that Canadian Natural filed to support its position
15 that there was an extremely low risk of fracturing, and
16 there I'm referring to the 96 wells that have already
17 been drilled at Kirby. And Canadian Natural provided
18 evidence that 95 of those 96 wells were started up with
19 no fracturing in the McMurray sands, let alone the
20 confinement strata. So based on that, would you agree
21 with me that the risk of fracture to the McMurray
22 reservoir, to the sands, is about 1 percent?

23 A No, I don't agree. It depends how you look at things,
24 again. I will refer to CNRL's table, Tab 37, which is
25 in the ...

26 Q I actually -- Ms. Giry, if I could try to help, I would

1 like to look at the Tab 37 as well. It is my third aid
2 to cross-examination.

3 A Okay.

4 Q If we could have that up, I think it would help both of
5 us.

6 A Yeah, because I think you are referring to it.

7 Q Actually, the reason I was referring to it is perhaps
8 different than you are, so why don't you finish your
9 comment on that. I was asking, just in terms of
10 straight numbers, that this field data supports
11 Canadian Natural's position that the risk of fracture
12 would be extremely low, less than 1 percent, and that
13 is based on the 96 wells already drilled. So I'd just
14 like your response on that question. Do you agree?

15 A I would like as well to actually point out some --
16 which I guess would be further questions to CNRL
17 tomorrow about that Table 37. Our understanding of the
18 start-up operation is the requirement for CNRL to lift
19 the liqueen [phonetic] in the vertical section of the
20 wellbore and to face the hydrostatic pressure in those
21 wellbores. You would expect hydrostatic pressure at a
22 well of 500 metres to be more as 5 MPa, and if we look
23 at this table or these 96 wells, maybe -- I don't have
24 the bottom of the table. If you go below, you would
25 see -- if you go below, below, below. That's good
26 enough. Oops. Yeah. You would see more or less,

1 yeah, about 40 wells, probably, 30 wells have start-up
2 pressure which are below hydrostatic pressure.

3 Q Yeah, I don't disagree with that.

4 While we're here, though, I might as well ask my
5 question on it. So in your -- if I can find it. I'm a
6 little bit out of order if you can bear with me now
7 just for a moment.

8 So one of the statements that you made in your
9 reply submission was that: (as read)

10 It is extremely likely that Canadian Natural
11 will push the start-up pressure at all KN06
12 wells above 6,500 kPa in 100 percent of the
13 cases.

14 And you made that statement; there was no facts to
15 support it.

16 MS. JAMIESON: If we could please,
17 Mr. Campbell, scroll to the top of this exhibit.

18 Q MS. JAMIESON: What we've done here in the
19 red markings is actually identified the ones that were
20 started up out of those 96 wells above the 6,500 kPa,
21 and we came up with 7, so that correlates to roughly 6
22 to 7 percent, which is a far way from the 100 percent
23 that you're alleging, and I just -- I guess I'm asking
24 if you would agree with me that that was an
25 exaggeration.

26 A MS. GIRY: So there are seven wells that

1 are above 6,500 kPa with an average depth of 520
2 metres. So the pressure gradient for those wells would
3 be around 12.5 kPa, maybe 12.6 kPa, the pressure
4 gradient for this well. If we use 12.5, 12.6 kPa per
5 metre at the level and the depths of the injector wells
6 in KN06, which is 480 metre, we would be at 6 MPa. So
7 our concern is that -- it's to compare apples to
8 apples. We've got to take into account that seven
9 wells above 6,500 in all the parts drilled so far do
10 not compare with KN06. KN06 is shallower. KN06
11 doesn't have continuous layers. KN06 has faults and
12 fractures and a compromised well.

13 Q I'm just speaking strictly to your comment that -- or
14 ISH's belief that in 100 percent of cases, Canadian
15 Natural will be starting up the KN06 wells above the
16 6,500 kPa, and I'm just asking, you know, what you're
17 basing that assertion on when their evidence is clearly
18 the opposite.

19 A Well, I will get back, probably, to my first point,
20 which is getting a better understanding of the
21 definition of maximum bottomhole pressure for the
22 circulation phase when I honestly don't understand how
23 we can have pressures below hydrostatic. The reason
24 why I don't understand that is because we are showed
25 that the maximum bottomhole pressure is reached when we
26 have to applaud -- or unload -- offload the well -- the

1 vertical section of the well.

2 Q So if I'm following you, your belief is that Canadian
3 Natural could start up much lower. Is that what you're
4 trying to get at? Is that why you're pointing out the
5 pressures closer to 5 MPa?

6 A The table said that -- where it started up, if you go
7 back to the bottom of the table, at 3,293.

8 Q Okay. Thank you, Ms. Giry. I don't think that I'm the
9 right person to be discussing that. Canadian Natural's
10 going to address their start-up pressure in their
11 evidence and why they need to go up to the 7 MPa.

12 I'd like to move to some of the comments you made
13 on ISH's -- or, sorry, on -- some of the comments you
14 made on Dr. Boone's risk assessment that was filed in
15 the proceeding. You make a number of comments there in
16 terms of, well, really criticism. Did you have a
17 geotechnical engineer or someone else trained in risk
18 assessment to review Dr. Boone's report?

19 A I have personally been trained in risk assessment as
20 part of my experience, 25 years with Total Energy, a
21 large, major international oil and gas company. And
22 then with the AER, we had numerous training there.
23 It's -- it's an organization which is very much into
24 risk-based analysis.

25 Q I agree with that.

26 Would you agree with me that the APEGA "Guideline

1 for Management of Risk in Professional Practice" is a
2 good starting point?

3 A I will probably not fully agree with that, particularly
4 if you refer to the metrics used by the APEGA. A risk
5 assessment is part of a larger risk framework, and each
6 company has to give their own framework.

7 Q Understood. I've read your view on that.

8 There is a statement in the APEGA guideline that
9 states that: (as read)

10 If there are specific historical data related
11 to the specific project or activity, [that]
12 these are often the better to use.

13 Do you agree with that statement that that's a good
14 idea?

15 A I couldn't hear your statement, what you read, and I
16 don't have the evidence for that one. Sorry.

17 Q Yeah. I'll repeat it, if that's okay, a little slower.
18 It's not long. The recommendation at page 16 --

19 A Sorry. The sound is not super good. Page 16? Okay.

20 UNIDENTIFIED SPEAKER: I don't know what document.

21 A MS. GIRY: Yeah. Me neither.

22 What document? Page 16?

23 Q MS. JAMIESON: I'm talking about the APEGA
24 guideline.

25 A Oh, that one. Okay.

26 Q The base for assessing risk, the concept, is that

1 historical data should be taken into account. So I
2 don't need you to turn anything up. I just -- I'm
3 asking if you agree that historical data would be
4 relevant and a good thing to consider on a risk
5 assessment.

6 A Well, a risk assessment -- the primary activity of a
7 risk assessment is to identify the risks.
8 Identification of the risks does not require necessary
9 data because you can have risks that are invisible; we
10 call them "phantom risks." And you have risks where
11 you have a lot of data on them, and those ones are
12 generally high likelihood, low -- low impact. So data
13 are necessary to quantify the risk, but there's -- you
14 really need to have your -- well, leave the analysis
15 open to all the risks that can happen in -- in -- in
16 the development.

17 Q Can I just confirm -- and I think I understand this
18 from your earlier comment, but what -- ISH also offered
19 its own risk assessment, and that was based -- my
20 understanding is the \$2 million consequence that you
21 identified was based on the idea of contamination of
22 the Mannville II and Mannville HH pool. Do I have that
23 correct, that that was the basis for that \$2 million
24 consequence that ISH put forward?

25 A It definitely impacts the GOB zone, and it could be
26 more than that if it -- yes, when it goes to the

1 Mannville HH.

2 Q And the way that the zone would be contaminated, from
3 ISH's viewpoint, would be up through this 10-01 well;
4 is that correct?

5 A That is correct.

6 Q All right. So let's talk about that a little bit.

7 Actually, these questions maybe I'll start with
8 Mr. Leech just in terms of his well-test evidence, and
9 then, Ms. Giry, I might have a couple more questions
10 for you if that's okay.

11 A Absolutely.

12 Q All right. If I can just take a moment to get
13 organized.

14 So, Mr. Leech, you filed a report, and I believe
15 it is attached to Exhibit 63.01. And if my page count
16 is correct, it should be at -- I'd like to look at your
17 executive summary, sir. It's located at page 53 of the
18 PDF, 53 of 102 pages.

19 A MR. LEECH: Right.

20 Q So, sir -- and I -- I'm just going to get up your
21 opening statement because I want to make sure that I
22 understood some of your comments, but since you filed
23 your report, you've now, I assume, received a copy of
24 the cement bond logs that Canadian Natural filed last
25 week; is that correct?

26 A I've looked at them.

1 Q Did you review the third-party independent assessment
2 of those logs, sir?

3 A I have looked at that, yes.

4 Q I'm going to suggest that those cement bond logs
5 confirm that there is no integrity issue at the 10-01
6 well. Do you agree?

7 A Not necessarily, no.

8 Q Why is that, sir?

9 A It's possible for cement bond logs to read a good
10 connection with the casing and not read a
11 miscommunication between the cement and the formation.

12 Q Okay. Thank you.

13 So I'd like to look at your report, the page that
14 we've got up. And it is small, at least on mine. But
15 you started, sir, with a couple of statements. You
16 state that -- and I'm going to find you the paragraph
17 so we can try to stay on the same page. So the third
18 paragraph down, you have a statement that: (as read)

19 ISH management reports that the wellhead is
20 chained and locked, the pipeline has been
21 disconnected, and they have no knowledge of
22 or involvement in any communication,
23 interference, or production operation at the
24 subject 10-01 well.

25 Correct?

26 A That's correct.

1 Q And you also state in the following paragraph that:
2 (as read)

3 The operational data were minimal and
4 somewhat piecemeal.

5 You acknowledge the circumstantial nature of your
6 conclusion: (as read)

7 The interpretation is subjective, the
8 analysis is speculative, and quantitative
9 values are considered best estimates only,
10 and thus the results cannot be warranted.

11 I'd like to understand, based on those qualifications,
12 what confidence we can have in your results.

13 A We have good confidence in some particular pieces of
14 the results, and then some other pieces of information
15 are rather ambiguous, so it's -- it's variable
16 throughout the data that I've looked at.

17 Q Okay. Thank you.

18 So let's move to your conclusion. The first one
19 is that: (as read)

20 The GOB gas has been flowing around or
21 through the 10-01 perforation.

22 Do you still agree with that, or after reviewing the
23 cement bond logs, does that change at all?

24 A I still agree with this.

25 Q And next you point to three possibilities for this gas
26 migration. First, "gas channelling behind the 10-01

1 casing," and this one you're saying -- you're
2 characterizing it as your most probable case:
3 (as read)

4 ... given apparent correlation of 16-35
5 production data to the 10-01 temperature and
6 pressure data.

7 And are you still standing by that statement, sir?

8 A I still think that's a probable cause -- a probable
9 possibility, yeah, yeah.

10 Q Just on that first one, sir, if -- well, let's -- let's
11 review the second and the third just so that we have
12 all the possibilities. So the second one was that:
13 (as read)

14 The 10-01 well has been tied in, and gas has
15 been stolen,
16 which you state is: (as read)

17 ... less probable except that (a) pressure
18 dynamics appear more hydraulic in nature than
19 via dampened reservoir communication, and (b)
20 the hard shut-in does not reflect typical
21 hydrating effects.

22 Do I have that right?

23 A Yes.

24 Q And then third: (as read)

25 The leaking packer at 16-35 possibly is
26 allowing gas migration into the Upper

1 Mannville HH from the Upper Mannville II.

2 And just to be clear before I go on, on your second
3 one, when you -- what you call a "hard shut-in" is just
4 another way of saying that the valve's been closed;
5 correct?

6 A Instantaneous shut-in. I cannot discount that a
7 hydrate could have caused that.

8 Q A hydrate or a valve closing?

9 A A hydrate or a valve closing.

10 Q Yes?

11 A Correct.

12 Q You're agreeing with me?

13 A Yes.

14 Q Okay. And so why is it not listed here in your
15 possible explanations for the gas migration simply that
16 the 10-01 well was flowing itself?

17 A Flowing itself where?

18 Q Well, just that it was flowing, that that would explain
19 the temperature and the readings that you saw.

20 A I don't think there -- I don't -- I think there's a
21 very high level of confidence that 10-01 is indeed
22 flowing, yes.

23 Q Okay. And then if ISH's management hadn't ruled out
24 the possibility for you, would you agree that another
25 explanation for the pressure and temperature behaviour
26 that you analyzed from the 10-01 well could be

1 production from the well itself?

2 A I suppose it could be. Except that I've been -- you
3 know, my professional colleagues have told me that the
4 well is blocked off and not flowing, so --

5 Q Understood. I understood.

6 But if you hadn't received those instructions,
7 would you have listed it as one of the possibilities
8 and perhaps the probable cause?

9 A I could have, yes.

10 Q Thank you.

11 Would you agree with me that -- would you agree
12 that if it was assumed that the 10-01 could flow at
13 surface, then the January 7, 2020 -- do I have that
14 date right? 2020? Yes. That hard shut-in measured on
15 the -- measured at the 10-01 well is unlikely to be
16 explained by gas channelling behind the 10-01 casing?

17 A If the -- if the hydrate was close to the wellbore,
18 somewhere within the wellbore, it could have caused a
19 hard shut-in.

20 Q Would another explanation just be the valve closing,
21 sir?

22 A Could be the valve closing.

23 Q And just on those hydrate formations -- and assuming I
24 know what I'm asking -- I understand that they only
25 show up in a certain hydrate regime, meaning you need
26 the right pressure temperature in order for them to

1 show up and that this 10-01 well is not in that range.
2 Do you agree?

3 A No, I do not agree. We -- I can demonstrate a hydrate
4 was formed within 10-01 during the Joule-Thomson
5 cooling event. There was a slug of liquid. There was
6 a sudden drop in pressure. A slug of liquid was
7 produced. And that created a hydrate, causing the
8 Joule-Thomson event. So that is -- suggests to me that
9 hydrates can occur within this well.

10 Q Sorry. Can you please explain to me what that event
11 looks like? What do you need for the -- sorry. What
12 did you call it, the Jones ...

13 A Joule-Thomson cooling event?

14 Q Yes. Can you explain for me what exactly is needed for
15 that to -- for that type of event to occur.

16 A Well, Joule-Thomson cooling occurs with any gas flow.
17 It's a natural phenomenon of -- of gas moving through
18 smaller orifices, so --

19 Q Okay, okay. And then you're saying -- your evidence is
20 that -- that you have evidence that a hydrate could
21 have been formed, and that would explain this blockage,
22 I guess, and that's one of your theories, but I think
23 you also agreed that it's also possible that the same
24 behaviour could have been caused by a shut-in?

25 A Yes, it could have.

26 Q All right. Can I please --- Ms. Giry, if I could go

1 back to you.

2 Thank you, Mr. Leech.

3 MS. JAMIESON: I just need to moment, if I
4 could, Madam Chair. Can I have just two or three
5 minutes to confer with my clients here? We are sort of
6 coming to the end of the cross, and I want to make sure
7 that I'm covering the right material. Is that -- can I
8 have a -- three minutes?

9 THE CHAIR: Yeah, that's fine. Turn off
10 your mic so we don't hear you and confer away.

11 MS. JAMIESON: Thank you, Madam Chair.

12 Q MS. JAMIESON: Ms. Giry, I'm going to get you
13 up on my screen so we can have a conversation. So,
14 Ms. Giry, just to follow up those questions, how much
15 gas does ISH think is flowing behind the 10-01 well?
16 Just a ballpark.

17 A MS. GIRY: Let me confer with my team. I
18 think it's somewhere.

19 So it is in David Leech's report, and I'm going to
20 show you where it is. About -- an estimated -- so if
21 you look at Mr. Leech's report, in 63.01, page 54, I
22 will read the second from the bottom -- second
23 paragraph from the bottom. Even -- yeah. Thank you.
24 I don't have it on mine because it's so small there.
25 Next page, please. Page 54. Yeah: (as read)

26 Even one year between 1,069 kPa and 753 kPa

1 would be a dramatic depression for an
2 estimated migration outflow of only one
3 (INDISCERNIBLE).

4 Q Okay. Thank you very much.

5 So I just want to confirm that it sounds like --
6 that ISH's evidence is that the most probable scenario
7 is that the 10-01 well is connected up to the Grand
8 Rapids; that would be the 16-35 well. The two wells
9 are connected such that that is the flow. Is that
10 correct? Is that what you're saying? I -- you did put
11 a schematic in your reply submission, and we're just --
12 I just want to confirm we've understood it correctly.

13 A So the flow is that Mr. David Leech's report is
14 demonstrating the flow behind the casing from the GOB
15 zone to the Mannville HH -- HH formation.

16 Q Okay.

17 A The gas migrates to that zone, and 16-35 is a well
18 producing from that zone -- is producing gas from the
19 same zone.

20 Q Okay. So the idea is that it's the gas coming up to
21 the 10-01 channel, in ISH's viewpoint, and it would be
22 being produced at the 16-35, which is also a GOB well;
23 correct?

24 A Just to make sure I understand, the gas which is
25 channelling behind 10-01 into the Mannville HH is
26 not -- like, 16 -35 is produced well -- gas from

1 Mannville HH. Just want to picture for you that it's
2 not necessarily instantaneously. You know, there's a
3 reservoir between the two wells.

4 Q At the 16-35, are you saying production from both
5 wells --

6 A 16 --

7 Q -- or, sorry from (INDISCERNIBLE - OVERLAPPING
8 SPEAKERS)?

9 A No. 16-35 is producing from Mannville HH. The GOB
10 zone from 16-35 is shut down by order of the GOB
11 shutting down.

12 Q Okay. Thank you. That's helpful. I understand that.
13 Thank you.

14 So let's just assume for a moment that there's not
15 an integrity issue with the 10-01 well because Canadian
16 Natural clearly disagrees with that. So if there's not
17 an integrity issue, do you agree that the 10-01 well
18 would be suitable for monitoring impacts to the GOB?
19 So now I'm talking about Wabiskaw B from the KN06 box.
20 If that was a good well, could it be used for
21 monitoring that zone?

22 A So admitting that somebody can explain the
23 Joule-Thomson effect that is observed in 10-01 -- so
24 once we get another possible explanation than the one
25 we provide, 10-01 well is equipped with special
26 temperature gauges to monitor the well integrity of

1 10-01, the cement integrity of 10-01. I will
2 remember [sic] the Panel that 10-01 is a thermally
3 noncompliant well initially. That's why it's been
4 reworked -- worked over by CNRL in 2015. So what is
5 not thermally compliant in that well is the -- still
6 the production casing is not thermally compliant. So
7 CNRL in 2015 installed cement plugs -- thermal cement
8 plug below the GOB perforations. So the -- the 10-01
9 well first objective is to monitor the thermal
10 integrity of that well, and the second objective is to
11 monitor the GOB zone.

12 Q Okay. Thank you.

13 So I think that was a "yes" if I understand you
14 correctly, that assuming there's no integrity issue, it
15 is -- it remains a suitable well for monitoring the
16 would be Wabiskaw B. Yes?

17 A It's a dual objective for that well to monitor the
18 thermal integrity of that well and the Wabiskaw B.

19 Q Thank you.

20 So if indeed the cement job is compromised, what
21 steps has ISH taken to repair those cement channels?

22 A Well, we received data from CNRL between 2019 and 2020,
23 so we are -- like you, I assume, like CNRL, analyzing
24 the situation, and 10-01 is compromised; it's a joint
25 well, and we'll have to discuss with CNRL.

26 Q Understood.

1 So you're saying you're analyzing. It is a joint
2 well. Canadian Natural certainly agrees with that.
3 But ISH is the operator of that well, so ISH would have
4 responsibilities under the AER directives and
5 guidelines to take steps to ensure the integrity of
6 that well. Is your evidence that no steps have yet
7 been taken?

8 A The -- as you could see, like the report from David
9 Leech indicates, the -- the well is compromised, and we
10 are hearing from CNRL that they still want to discuss
11 that -- that possibility. We are very firm about --
12 that this well is compromised. When the two parties
13 agree that the well is compromised, we will talk and
14 discuss with the AER about the next steps.

15 Q Have you conducted a pressure test? Because, again, my
16 understanding is that's going to tell us very quickly
17 whether or not there's a problem.

18 A The GOB zone pressure, as you can see from the data
19 acquired from these pressure builds, is actually around
20 800 kPa. So doing a pressure test of 7 MPa is not
21 proving anything. We have to look at the
22 CBL [phonetic] that would be done at the lower
23 pressure. 7 MPa is not representative of the GOB zone.

24 Q And what about a shut-in test to the Grand Rapids. Has
25 that been performed?

26 A The next steps that we should talk about with CNRL is

1 will they consider to run a chat log? Chat logs are
2 logs that will help both parties to analyze if that
3 well has been flowing, is flowing by showing if there
4 are some gas storage behind or around the cement.

5 Q Okay. I believe Leech -- Mr. Leech recommended that
6 test in his report. And it sounds like your answer is,
7 yes, ISH thinks that should be done as well, and --
8 yes? Was that your answer?

9 A There are tests that need to be run or -- on 10-01,
10 like I mentioned, running a chat log, and around 10-01
11 testing Mannville HH, particularly looking at 16-35.

12 Q Okay. So you agree that it needs to take place, but
13 you have not performed that test to date; correct?

14 A We have not performed that test to date. We're in the
15 process of procuring some pressure measurements at
16 wellhead.

17 Q Okay. But there is a chance, then, that you're still
18 producing the Mannville II gas; is that right? If you
19 haven't taken the test and you don't know, is there
20 still a chance that the Mannville II pool is being
21 produced?

22 A I think with the conversation you had with David Leech,
23 he mentioned that there was an instantaneous shutdown
24 on January 7th on the 10-01, which -- he referred these
25 things; it's likely a hydrate phenomenon.

26 Q Sorry. I'm not sure whether I'm not asking my

1 questions right or whether I'm getting confused, but it
2 sounds to me like there's still a chance that a GOB
3 well is out there being produced and ISH has not taken
4 steps to confirm one way or the other?

5 A I don't understand your question. I think I just
6 answered to you. We are talking about the 10-01 well.
7 It has been proven to flow behind casing, particularly
8 looking at the Joule-Thomson effect. That well is now
9 not flowing according to the pressure temperature
10 measurement. I am -- I think I understand -- I
11 answered that question, but maybe you want to be more
12 precise.

13 Q Yes. I'll try again. Sorry. Thank you for that.
14 Yeah. I understood that's your evidence on 10-01.

15 On 16-35, our understanding is that the rate has
16 not dropped, suggesting that that well is still
17 flowing, it's a GOB well, and that ISH has not taken
18 steps to shut it in or to confirm that one way or the
19 other. Is that the case?

20 A 16-35 is --

21 MS. BERG: Well, sorry. I -- I think
22 Ms. Giry has been very clear that the 16-35 is -- is
23 not producing from the GOB. I don't know if she
24 needs to say that again -- how many times she needs to
25 say that, but the questions that continually suggest
26 that 16-35 is flowing from the GOB when that's been

1 asked and answered, I -- I'm concerned about.

2 MS. JAMIESON: So if I can just respond to
3 that, there is -- there is some confusion because there
4 are two zones at the 16-35, and ISH is putting forward
5 a theory that the 10-01 well is flowing to the 16-35.
6 So my questions are really aimed at both of those zones
7 and what's going on at the 16-35. Like, for ISH's
8 theory to go around, then the production at 16-35 needs
9 to be dealt with. That's where I'm coming from.

10 A MS. GIRY: Is it a question?

11 Q MS. JAMIESON: I think 16-35 -- sorry. If I
12 could have another moment. This part is confusing, and
13 I appreciate, Ms. Giry, you're being very patient with
14 me. I appreciate that.

15 MS. JAMIESON: So, Madam Chair, if I could
16 have -- I know our time is coming up -- just a couple
17 more minutes, and I will confirm that we're -- our
18 final question.

19 THE CHAIR: Okay. So that was going to be
20 my question, is: Are we close to the end of your
21 questions, depending on what you sort out here?

22 MS. JAMIESON: I'd like to sort out the 10-01
23 and just make sure it's clear and, in particular, how
24 these two wells relate. And then I do have about five
25 questions on the last question, which has to do with
26 monitoring option.

1 THE CHAIR: We are at 5:23. I'm concerned
2 about our court reporter, potentially also people who
3 are participating from home, who at this time of day
4 are going, I imagine, to begin to have other kinds of
5 distractions and things going on. So if you think that
6 after conferring you can wind it up in sort of five to
7 ten minutes tops, then I'm fine with that. Otherwise
8 maybe now would be a good time for the break for the
9 day, and we can continue in the morning.

10 MS. JAMIESON: No. I will promise you
11 that -- I think your clock is a little different than
12 mine, but if yours says 5:23, I'll be done by 5:33.

13 THE CHAIR: That's good enough. I'm a
14 minute ahead. Let's go.

15 MS. JAMIESON: All right. Thank you very
16 much.

17 Okay, Madam Chair. I'm back.

18 Q MS. JAMIESON: If you'll humour me, Ms. Giry,
19 I'm going to ask you one final question on the 10-01
20 well and then move on. And so this is the question:
21 We're going to assume the 10-01 well is flowing the way
22 ISH suggests, and then it must be flowing to the 16-35
23 well. It has -- it needs to be going somewhere. There
24 are two zones at the 16-35 well. One is Mannville II,
25 which is a GOB zone and shut-in; we understand that.
26 That's ISH's evidence on that. But if the 10-01 is

1 flowing, it must mean it's going up into the
2 Mannville HH and is producing. Do you agree, Ms. Giry?

3 A MS. GIRY: So the -- again, I will refer
4 to the David Leech report. The 10-01 well was flowing,
5 I will say, based on the pressure at that time until
6 January 7th and David Leech's report indicates it was
7 flowing behind casing into the Mannville HH -- into the
8 Mannville HH reservoir. And then the well 16-35, which
9 is (INDISCERNIBLE) metres away is producing from the
10 same reserve well.

11 Q Are you saying that the Mannville HH -- the 16-35 at
12 the Mannville HH formation is producing? Is that what
13 you just said?

14 A 16-35 at the Mannville HH is definitely producing, yes.

15 Q At Grand Rapids.

16 And has the temperature dropped -- or, sorry, the
17 pressure dropped because -- the gas rate dropped
18 because the shut-in at 10-01 would have resulted in a
19 drop at 16-35? So has the production rate at the 16-35
20 well dropped since that hard shut-in on January 7th?

21 A Let me confer with the team. I think we have a graph,
22 and I want to ask them.

23 Q Thank you.

24 A Sorry for taking some time. I was searching for the
25 evidence in David Leech's report. And I will point out
26 that page -- page -- sorry, page 65, that's -- 66 is --

1 yeah. 66 is where we can see the 16-35 gas rate. And
2 if I read that properly, it looks good. And operators
3 are continuously working on the well to make sure --
4 yes. That's perfect -- to make sure that we are
5 producing properly this way.

6 Q Ms. Giry, I think my clients are telling me they
7 understand this graph, and because I promised Madam
8 Chair that I would finish up, can I ask you instead my
9 last question?

10 A You're the boss.

11 Q Thank you.

12 So -- and this just has to do with ISH's comments
13 on the remaining reserves that you included in your
14 opening statement and just that you didn't think that
15 it was a relevant consideration. So my question is:
16 Is it your view that the Alberta Energy Regulator
17 should not be considering the value of the reserve when
18 it's considering extra costs to Canadian Natural to
19 monitor the GOB?

20 A Well, the mandate of the AER is to avoid wasteful
21 operations of oil and gas resources and to protect all
22 producers and allow them to gain from their --
23 from their -- to obtain production from their feeds.
24 So I don't know if it answers your question, but that's
25 the mandate of the AER.

26 Q Yeah, I understand the mandate of the AER. The AER's

1 also mandated to consider, you know, economic
2 considerations, factors, costs, and benefits, and so
3 I'm asking whether or not your view is that the costs
4 of these proposed monitoring options that ISH has put
5 forward -- and you've put forward several, the obs
6 [phonetic] well, the 4D seismic. All of those cost
7 money. And is it your view that that -- those costs
8 should not be considered up against the value of the
9 reserve?

10 A So let me confer.

11 So -- sorry. Thank you. It's getting late in the
12 evening, and my brain tends to freeze after 5:30. So
13 the question, I think, is about the value, but the
14 question is also about who is impacted here. We are
15 impacted, and CNRL gets the opportunities. And so we
16 are saying we should not be the only one to carry the
17 burden. We have resources, and we have to develop them
18 at the time whenever we can. The costs for developing
19 bitumen resources for CNRL and the cost to monitor
20 their development belongs to that development. Every
21 other operator is putting in place sufficient
22 monitoring to enhance their own development and protect
23 any other stakeholders, whether it's us, like oil and
24 gas, or other stakeholders at surface, monitoring gas,
25 monitoring water, everything. So it's always been my
26 understanding that when you make a development and

1 you -- when you operate a development, you carry the
2 cost -- all the costs of that development.

3 Q Yes. I think my -- my question that I -- it was a
4 little more simpler than that, and I think that I just
5 want -- you don't -- okay. Do you disagree -- or do
6 you agree with me that the cost of these different
7 monitoring options is a relevant consideration for the
8 AER to take into account?

9 A I disagree. The --

10 Q Thank you.

11 A -- cost of monitoring this bitumen is part of the
12 development of these bitumen resources.

13 Q Thank you very much.

14 MS. JAMIESON: So, Madam Chair, those are all
15 of my questions.

16 Ms. Giry, thanks for your patience.

17 And I believe I can stand down. Yeah.

18 THE CHAIR: Okay. You got the nod from
19 the team?

20 MS. JAMIESON: I got the nod. Thank you.

21 THE CHAIR: Thank you, Ms. Jamieson.

22 So with that, we will adjourn for the day. I
23 believe we are scheduled to start tomorrow morning
24 at 9, and we'll be starting with AER staff questions
25 for the ISH witness panel.

26 ISH witnesses, I'm certain that Ms. Berg has

1 already gone over this with you, but as long as you are
2 still under questioning by any party, we have to keep
3 to the same no conferring with counsel or anybody other
4 than who was on the panel with you practice.

5 So with that, unless --

6 MS. BERG: And -- sorry. And I did want
7 to raise that issue because --

8 THE CHAIR: Okay.

9 MS. BERG: -- obviously, witnesses remain
10 under oath. I can't discuss any of their evidence with
11 them, but I still have work to do tonight on the CNRL
12 cross, and given the technical nature of a lot of that
13 cross, I -- I do need assistance from members of the
14 team, and so, obviously, we all know; cannot discuss
15 ISH evidence at all, but I -- I would like the ability
16 to -- to speak to witnesses regarding the CNRL cross.
17 We -- we have a fair bit of work. I've -- I've got
18 about a day of cross for CNL -- CNRL right now, and --
19 and we need to cut it down to three hours this evening,
20 so -- and I -- I will need assistance with that.

21 THE CHAIR: Ms. Jamieson, you're lit up
22 there.

23 MS. JAMIESON: Yeah. So I would just -- I'm
24 concerned about that for sure because some of that
25 cross, I think, was probably prepared beforehand, which
26 Ms. Berg would have had the benefit of her client's

1 input at that time. I'm noting that tomorrow there is
2 opportunity for ISH, it looks like. Like, once that
3 ISH panel stands down, it looks like there's at least
4 one break in the lunch break that Ms. Berg could speak
5 with her clients and get some last-minute direction.
6 But we're doing this on the fly as well, so I -- those
7 would be my comments.

8 MS. BERG: So just to respond, I
9 anticipate that we'll be spending much of the lunch
10 break reviewing the 1.5-hour opening statement that
11 CNRL is going to be -- is going to be putting in. So
12 what I would propose -- because, literally, we have the
13 whole team here with the back-room support, so what I
14 would propose is that I at least be able to confer with
15 people providing back-room support with regard to
16 the -- the preparation of cross. And just, again, in
17 response to the -- being in a similar position to CNRL,
18 yeah, I -- we -- we are the night before cross, and --
19 and there is work to do, so ...

20 THE CHAIR: So I'm not going to make this
21 call on my own. I'm going to ask Commissioner Zaitlin
22 and Commissioner McKinnon to join me in our breakout
23 room for a minute or two. We'll be right back.

24 So thank you for your patience. We've had a
25 discussion, and the Panel's view is that Ms. Berg's
26 second suggestion, that is, that she be permitted to

1 work with the support side of the ISH witness panel to
2 pare down the cross-examination, is a reasonable
3 compromise, so with the understanding on her part and
4 the rest of the ISH witness panel that the main ISH
5 witnesses will not be participating in that process.

6 MS. BERG: Yes. Thank you.

7 THE CHAIR: And if everybody's clear on
8 that, then we will adjourn for the day.

9 _____
10 PROCEEDINGS ADJOURNED UNTIL 9:00 AM, OCTOBER 14, 2020

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1 CERTIFICATE OF TRANSCRIPT:

2

3 We, Sarah Howden and Andres Vidal, certify that
4 the foregoing pages are a complete and accurate
5 transcript of the proceedings taken down by us in
6 shorthand and transcribed from our shorthand notes to
7 the best of our skill and ability.

8 Dated at the City of Calgary, Province of Alberta,
9 this 13th day of October 2020.

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Sarah Howden, CSR(A)

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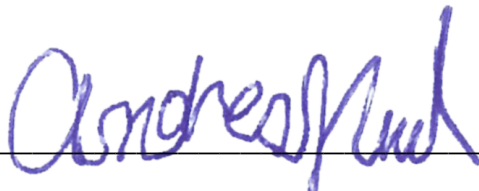
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Andres Vidal, CSR(A)

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Official Court Reporter

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