Joint Review Panel
Public Hearing

Frontier Oil Sands Mine
Project

Commission d'examen conjoint
Audience publique

Projet de mine de sables bitumineux
Frontier

Joint Review Panel
William (Bill) Klassen
Alex Bolton
Robert McManus

Commission d'examen conjoint
William (Bill) Klassen
Alex Bolton
Robert McManus

MacDonald Island
1 CA Knight Way
Fort McMurray, Alberta

September 25, 2018

l'île MacDonald
1, CA Knight Way
Fort McMurray (Alberta)

Le 25 septembre 2018
This publication is the recorded verbatim transcript and, as such, is recorded and transcribed in either of the official languages, depending on the languages spoken by the participant at the public hearing.

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Fort McMurray, Alberta / Fort McMurray (Alberta)

--- Upon commencing on Tuesday, September 25, 2018
at 0901 / L'audience débute le mardi 25 septembre 2018 à 0901

THE CHAIRPERSON: Good morning,
everyone. Please be seated.

Good morning, ladies and gentlemen.

Thanks for taking the time to participate in this
hearing.

My name is Alex Bolton and I'll be
chairing this proceeding.

On my right is Rob McManus and on my
left, Bill Klassen.

Before proceeding I would like to
acknowledge that we are on the Traditional Territory of
the Indigenous Peoples of Treaty 8 and within the
homeland of the Métis people of the Métis Nation
Region 1.

Counsel assisting the Panel during
these proceedings are Meaghan LaCasse and Alison Doebele
of the AER Law Branch, and Charles Birchall representing
the Canadian Environmental Assessment Agency, which I
will refer subsequently to as CEAA.

Present from the AER Authorizations
Branch we have Renato Chiarella, Kenneth Yap, Adriana
Ledi, Africa Gerewew, Yetimgeta Mihiretu, Charly Wang,
Rod Drummond, Wally Qiu, Steven Stryde, Dan Slavik,
Leanne Erickson, Margaret Magai, Agnes Wajda-Plytta,
Ernst Kerkhoven, Chris Teichreb, Eva Kilinska, Geoff
Granville and Blair Bailey.

Present from Hearing Services are Tara
Wheaton and Dean Campbell.

The Panel Manager from CEAA is David
Haddon.

Analysts from CEAA present are Jason
Patchell, Elyse Maisononneuve, Claudette Bois and
Robin-Lynne Virtue.

A CEAA Registry Officer, Monica Losier,
is located at the back of the room.

Jordan Fitzgerald from the AER's
Communications and International Relations Branch and
Lucille Jamault from the Panel's Communications Advisor
from CEAA are also in the room.

I would also like to note the presence
of Dennis Naas over there and Cheolho Ham from the AER's
Corporate Security Group. The presence of security
staff is common at larger hearings such as this. It's
intended to ensure the safety of all of the participants
in the proceeding and to help ensure that the hearing
process goes smoothly and that the schedule can be
maintained and all of the participants have an opportunity to be heard.

The Panel also understands that there are members of Teck's security team present both within the hearing room and outside.

All of the AER and CEAA staff in attendance will be wearing nametags for the duration of the hearing. If anyone has any questions, please feel free to approach David Haddon, Tara Wheaton, Meighan LaCasse, Alison Doebele or Charles Birchall for assistance.

Please do not attempt to communicate directly with the Panel Members other than in the course of the hearing process. We are not trying to be unfriendly but in our roles as quasi-judicial decision-makers it's very important that any communication with the Panel occurs within the hearing process in an open and transparent manner. We appreciate everybody's understanding and adherence to this request.

As noted on the signs about the room there are live audio and video streams of this proceeding available to the public through the AER's website. Anyone in the hearing room could be captured in the broadcast. So if you have any concerns about
this, please see the AER or CEAA counsel during one of
the breaks to explain your concerns.

The audio and video webcasts are not
the official transcripts of the proceeding. The
official transcripts will be posted daily to the
Canadian Environmental Assessment Registry page for the
project or the CEAA Registry.

To make the audio webcast work well
everyone must use the microphones when speaking, and the
audio technicians will control the microphones and only
one person may speak at a time.

Also, for the benefit of the Court
Reporter, when you're approaching the microphone for the
first time, please state your name so that it's clear
who is speaking.

Mr. Haddon, could you please read out
the safety procedures as well as the particulars of this
proceeding and the publication of the Notice of Hearing.

MR. HADDON: Yes, Mr. Chairman.

So for the safety procedures, if you
hear a fire alarm, listen to the instructions.

A first-stage alarm will have no strobe
lights and a loud audible alarm sounding. Remain calm
and move in an orderly and controlled manner. Muster in
the main concord areas but away from the immediate area
of exits and prepare for evacuation. Wait for
instructions from Fire Wardens who will be wearing
yellow-orange high visibility vests to identify
themselves.

In the event of a second-stage alarm
you will observe strobe lights as well as the active and
loud audible alarm. In the case of a secondary alarm,
evacuate via the nearest fire exit. Walk, don't run.
Help persons requiring assistance. Assemble at a Muster
Point clear of and away from any building or fire
equipment. Follow the directions provided by Emergency
Responders and RRC Fire Wardens. Do no re-enter the
building until given an all clear by the Chief Fire
Warden. Assemble at a Muster Point clear and away from
any building or fire equipment.

Evacuation routes. So when the fire
alarm sounds, proceed to the double doors in the
northwest corner of the room, which are the ones you
came in from; turn right, go down the stairs and proceed
to Muster Point B, which is the public parking lot
between the Community Centre and the Miskanaw Golf
Course. If the primary route is blocked, exit out the
back of the room to the deck and then turn left; go to
the end of the deck, down the stairs and proceed to the
Muster Point.
In the event of a medical emergency, phone 9-1-1 immediately. Have someone notify AER or CEAA staff and have someone contact RRC Safety and Security at 780-881-0101 or by radio so they can attend and assist with providing First Aid and coordinate a response to the incident.

Now, just a few words about this Panel and proceeding.

This Joint Review Panel was established to review the proposed Frontier Oil Sands Mine Project -- which I'll refer to as the project -- and conduct an assessment of the environmental effects of the Project. The project includes the construction, operation and reclamation of an oil sands surface mine with a production capacity of about 41,300 cubic metres a day, which is approximately 260,000 barrels per day, of bitumen. The project is located in northeastern Alberta, approximately 110 kilometres north of Fort McMurray. The project is a truck and shovel mine which includes two open pits, an ore preparation plant, a bitumen processing plant, tailings preparation and management facilities, cogeneration facilities, support utilities, disposal and storage areas, river water intake, a fish habitat compensation lake, bridge, roads, airfield and camp. The estimated project area is
approximately 29,200 hectares. If the project is approved, it would operate for 41 years.

A Public Notice of Hearing was issued on June 6, 2018 and invited Indigenous groups, interested parties and government authorities to request the opportunity to participate in the assessment.

The Panel determined that the following groups had previously demonstrated that they may be affected by the project or have relevant information or expertise about the project and were invited to participate in the hearings. Those groups include the Athabasca Chipewyan First Nation, Fort Chipewyan Métis Local 125, Fort McKay First Nation, Fort McKay Métis Community Association, Métis Nation of Alberta Association Fort McMurray Local Council 1935, Métis Nation of Alberta Association Lakeland Local Council 1909, Mikisew Cree First Nation, Oil Sands Environmental Coalition (OSEC), Canadian Parks and Wilderness Society Northern Alberta Chapter (CPAWS), Keepers of the Athabasca, and the Aboriginal Consultation Office of Alberta Indigenous Relations, whose participation is provided for by Ministerial Order.

Teck Resources Limited, Environment and Climate Change Canada, Parks Canada Agency, Health Canada, Transport Canada, Department of Fisheries and
Oceans, Natural Resources Canada and the Canadian Environmental Assessment Agency were required to participate in the hearing.

For purposes of the Hearing Record, Mr. Chairman, the Notice of Hearing can be found on the CEAA Registry, Document No. 398.

Letters granting participant status were also sent to the following parties who requested participation: Fond-du-Lac First Nation, Deninu Kue First Nation, Katl’odeeche First Nation, Original Fort McMurray First Nation and Clearwater River Band No.175, Wilderness Committee, Smith’s Landing First Nation, Council of Canadians, Stand.earth, Sierra Club of British Columbia, Northwest Territory Métis Nation, Glasswaters Foundation, and the International Brotherhood of Electrical Workers Local 424.

On July 12, 2018, the Panel issues a Revised Notice of Hearing announcing the hearing would commence at 9 a.m. on September 25th in Fort McMurray. The Notice provided a preliminary schedule of filing submission dates for the hearing.

For purposes of the Hearing Record, Mr. Chairman, the Revised Notice of Hearing can be found on the CEAA Registry, Document No. 464.

Mr. Chairman, I would like to remind
participants that the materials filed respecting the proceeding can be found on the CEAA Registry.

That's it.

THE CHAIRPERSON: Thank you, Mr. Haddon.

If a party would like to submit a document into evidence during this hearing, you are requested to submit an electronic copy to Mr. Haddon or Ms Wheaton so that it can be shown on the monitors and added to the CEAA Registry. Paper copies should be distributed to the Hearing Panel, counsel and all parties participating in the hearing.

I would now like to register the participants in the hearing. Please note that we have a Court Reporter here to obtain a transcript of these proceedings. I would ask that you speak clearly so that an accurate transcript is obtained and, as I mentioned, please move to a microphone to speak.

The AER received submissions from Teck Resources Limited, the Canadian Parks and Wilderness Society Northern Alberta, the Oil Sands Environmental Coalition, Fort McKay First Nation, Stand.earth, Sierra Club BC, the Council of Canadians, Original Fort McMurray First Nation and Clearwater River Band No.175, the Wilderness Committee, Smith’s Landing First Nation,
Deninu Kue First Nation, Northwest Territory Métis Nation, Keepers of the Athabasca, Athabasca Chipewyan First Nation, Mikisew Cree First Nation, Environment and Climate Change Canada, Health Canada, Transport Canada, Natural Resources Canada, Parks Canada, and whole of Government of Canada submission from CEAA. Also the Department of Fisheries and Oceans, from the Katl-odeeche First Nation, and Glasswater Foundation.

So who's representing Teck Resources?

MR. IGNASIKA: Good morning, Mr. Chair, Panel Members. My name is Martin Ignasiak. I'm with the law firm Osler, Hoskin, and Harcourt. With me are associates from our firm, Justin Fontaine and Danielle Chu, as well as Scott McKenzie from Teck Resources.

THE CHAIRPERSON: Thank you, Mr. Ignasiak.

Who's representing the Canadian Parks and Wilderness Society, Northern Alberta?

MR. YEUCHUK: Drew Yewchuk of the University of Calgary Public Interest Law Clinic. My co-counsel, who are not here yet, are Shaun Fluker and Christine Laing.

MS ALLISANDRINI: And I'm Adean Allisandrini. I'm the Boreal Program Manager at CPAWS Northern Alberta.
THE CHAIRPERSON: Okay, thank you.

Who is representing the Oil Sands Environmental Coalition?

MR. ROBINSON: Good morning, Mr. Chairman and Panel Members. My name is Barry Robinson. I am counsel for the Oil Sands Environmental Coalition along with co-counsel Kurt Stilwell, who is with me today as well.

We will have a preliminary matter about a document that was filed but it's not showing on the registry yet. And I wondered if you wanted us to deal with that now or later?

THE CHAIRPERSON: We'll deal with that after we've registered the participants.

MR. ROBINSON: Very good.

THE CHAIRPERSON: Thank you.

MR. ROBINSON: Thank you.

THE CHAIRPERSON: Who is representing Fort McKay First Nation?

MR. ARROBO: Good morning Panel Members and Panel Chair. My name is Bori Arrobo and I'm representing for McKay First Nation. Tarlan Razzaghi from Boughton Law is representing for McKay First Nation for these proceedings. Thank you.

THE CHAIRPERSON: Thank you.
Who is representing Stand.earth? No one here from Stand.earth? Okay.

Who's representing Sierra Club B.C.? No one here from Sierra Club B.C.?

Who's representing the Council of Canadians?

MR. HADDON: So, Mr. Chairman, I received an email two days ago informing me that Ms. Tucker will be representing Council of Canadians, but she was unable to be here today, as she is out of town on another matter.

THE CHAIRPERSON: Okay, thank you, Mr. Haddon.

Who is representing the Original Fort McMurray First Nation and Clearwater River Band 175?

MS GLADIEU-QUINN: Good morning. I'm Darlene Gladieu-Quinn, representing the Original Fort McMurray First Nation and Clearwater River Band. I am legal counsel, Triune Law. I have interim acting chief John Malcolm present and Raymond Richards for both bands. John Malcolm is the acting manager of the Clearwater River Band and acting chief of the Original Fort McMurray First Nation.

THE CHAIRPERSON: Thank you.

Who is representing the Wilderness
Committee? No one from the Wilderness Committee here? Who is representing Smith's Landing First Nation?

MR. EVANS: Good morning, Panel. My name is Morris (phonetic) Evans, spelled Maurice Evans, the CEO of Smith's Landing First Nation. And I'm here just today to listen and other folks will show up when they're scheduled.

THE CHAIRPERSON: Okay.

MR. EVANS: Thanks.

THE CHAIRPERSON: Thank you.

Who is representing the Deninu Kue First Nation? No one here from the Deninu Kue First Nation?

Who is representing the Northwest Territory Métis Nation?

MR. GUSTAFSON: Good morning, Panel Members. My name is Mark Gustafson. I'm legal counsel with the Mikisew Cree First Nation, but I've been asked to register two representatives from the Northwest Territory Métis Nation. They are Dr. Ronald Yaworsky and Mr. Earl Evans. Thank you.

THE CHAIRPERSON: Thank you.

Who is representing Keepers of the Athabasca?
MS ASTERISK: Good morning to the Panel. I'm Jule Asterisk. I'm the executive director for Keepers of the Athabasca. Thanks for having us.

THE CHAIRPERSON: Thank you.

Who is representing the Athabasca Chipewyan First Nation?

MR. MURPHY: Mr. Chair, Panel Members. My name is Eamon Murphy. I'm legal counsel for the Athabasca Chipewyan First Nation. With me is my colleague Matt Hulse. He is also legal counsel for ACFN. Thank you.

THE CHAIRPERSON: Thank you.

Who is representing the Mikisew Cree First Nation?

MS BROOKS: Good morning, Mr. Chair and Panel Members. My name is Karey Brooks, legal counsel for Mikisew Cree First Nation. And also with me is my co-counsel, Mark Gustafson. And today we also have with us from Mikisew Cree First Nation Chief Archie Waquan, as well as Councillor Calvin Waquan. And also sitting at participant table are members of the Government and Industry Relations office, Melody Lepine, Dan Stuckless, and Margaret Luker. Thank you.

THE CHAIRPERSON: Thank you.

Who is representing the departments and
agencies of the Government of Canada?

MR. DRUMMOND: Good morning, Mr. Chair, Panel Members. My name's Robert Drummond along with my co-counsel James Elford for the Attorney General of Canada, representing the federal departments and agencies. Thank you.

THE CHAIRPERSON: Thank you.

Are there any representatives from the Katl'odeeche First Nation?

MR. T'SELEIE: Good morning, Panel. My name is Daniel T'seleie, and I'll be representing Katl'odeeche First Nation. Thank you.

THE CHAIRPERSON: Thank you.

Are there any representatives here from Fond du Lac First Nation? No representatives from Fond du Lac First Nation?

Are there any representatives from the Glasswaters Foundation?

And are there any representatives from the International Brotherhood of Electrical Workers Local 424?

MR. CRICHTON: Good morning, Mr. Chair. My name is Scott Crichton. I am an assistant business manager with IBEW Local 424. Thank you.

THE CHAIRPERSON: Thank you.
I believe that is all of the parties.

Is there anyone I missed? If so, please come forward.

Okay -- oh.

MR. STUCKLESS: Good morning, Panel and Chair. My name is Dan Stuckless, and I also wear another hat for the Cumulative Environmental Management Association. We're not providing any evidence to this hearing for consideration, but we wanted to let the Panel know that we are in the room monitoring the proceedings. And if there's any questions, we would be here on site to -- any questions that come up with any of the evidence. CEMA has been referenced heavily in many of the industry documents in past panels going back in oil sands at least 10 years.

THE CHAIRPERSON: Okay, thank you, Mr. Stuckless.

Okay, I'd now like to briefly explain the procedures we'll use for the hearing.

In accordance with section 21 of the Alberta Energy Regulators Rules of Practices, all witnesses must give evidence under oath or affirmation. The court reporter will provide for this at the time that the witnesses come forward to give their evidence.

Please note that we will not be qualifying expert witnesses in this hearing.
We will first ask Teck Resources to come forward and present its direct evidence. Witnesses for Teck will then be available for cross-examination by participants in the order that you were registered, unless the Panel agrees otherwise, followed by questions from AER and CEAA staff and then the Panel.

Following that, counsel for Teck Resources will have an opportunity to conduct re-direct examination of the witnesses on matters arising from the cross-examination from their witnesses.

Next, the participants will present evidence in turn according to the hearing schedule, which was circulated late last week, and be subject to cross-examination or questions from Teck Resources, any other parties that may be adverse in interest, AER and CEAA staff, and finally from the Panel.

Following that, counsel for participants will have an opportunity to conduct re-direct examination of their witnesses on matters arising from the cross-examination.

The Panel will call on participants to give their evidence in the same order that the party is registered in the hearing, which is consistent with the schedule, unless some alternate agreement is approved by the Panel.
Once we have heard from all the participants, we will then provide an opportunity for Teck Resources to present any rebuttal evidence if it wishes to do so. If rebuttal evidence is presented, it will be subject to cross-examination from the participants, AER, and CEAA staff and the Panel.

Once the evidentiary portion of the hearing is concluded, there will be an opportunity for closing argument from Teck Resources and the participants in the order of registration. Teck will also have an opportunity to respond to the closing statements presented by participants.

The Panel intends to seek input from the participants before scheduling final argument.

As for today’s schedule, the Panel proposes to break for lunch at approximately 12 o’clock and reconvene at approximately 1 o’clock. We will look for a convenient spot in the proceedings to make that break, to try not to disrupt people’s evidence or cross-examination.

We will also take breaks mid-morning and mid-afternoon, and all of this of course depends on the various developments that can alter the schedule.

We will try to be flexible if possible to accommodate people’s needs. And just a reminder that
if you do happen to engage in a conversation with a Panel member, you need to refrain from bringing up any substantive matters that are under scrutiny as part of this hearing.

Are there any questions about the procedures that we intend to follow today?

Okay, seeing none, I will note that at this time there are three outstanding motions that the Panel is yet to rule on: one from Keepers of the Athabasca, one from the Athabasca Chipewyan First Nation and one from the Mikisew Cree First Nation. Decisions on those motions will be forthcoming once the submission process has concluded.

With that, are there any other preliminary matters that parties wish to raise at this time?

MR. ROBINSON: Mr. Chairman, Barry Robinson representing OSEC.

On Friday we filed a document which was aids to questioning. I spoke to Ms Wheaton on Friday, or had an e-mail exchange with Ms Wheaton on Friday, about whether we needed to bring paper copies, and I was advised that I didn’t need to; that they would be on the Registry. But I notice that that document is not showing on the Registry.
Out of an abundance of caution, I do have some paper copies with me but they are probably not sufficient to meet the rules. So what I propose is maybe at the first break I will provide some copies to Ms Wheaton to be distributed to you, if that works for you.

Mr. Ignasiak advised me that he received the copies and he has no difficulty.

THE CHAIRPERSON: Mr. Haddon?

MR. HADDON: Mr. Chairman, I thought I would just add some more information.

So we did receive the document you speak of and it will be available on the CEAA Registry either right now or in the very near future. It will be Document No. 557.

THE CHAIRPERSON: 557? Thank you.

MR. ROBINSON: Thank you, Mr. Chairman.

THE CHAIRPERSON: Are there any other preliminary matters?

Okay, seeing none, I will ask counsel for Teck Resources to seat the witness panel, which looks like it is seated, and swear their witnesses and then introduce the panel.

MR. IGNASIAK: Thank you, Mr. Chairman.

Yes, the witnesses are seated.
To comply with the rules regarding the room and the set-up, some of our witnesses are actually seated back behind my right shoulder. What I propose, though, is that despite the fact they are not seated right here, they all be sworn in. We have 26 witnesses.

I will go through the list of their names perhaps after they have been sworn or affirmed, if that fits with how you would like to proceed.

THE CHAIRPERSON: Yes, I think it does. I think the challenge of course will be for the Court Reporter to know who is speaking. So when you have witnesses speak, if they could again for the record just say their name, particularly those in the back which will be more difficult to see.

MR. IGNASIUK: Yes, I’ve discussed that with the Court Reporter. So we will work with her to make sure that her job is no harder than it already is.

THE CHAIRPERSON: Okay, thank you.

--- Pause

MS LaCASSE: Mr. Chair, could we just have two minutes. We’ve had a slight glitch in this usual process.

THE CHAIRPERSON: Yes, let’s take a short break to work out the logistics here.

--- Upon recessing at 0929 / Suspension à 0929
--- Upon resuming at 0930 / Reprise à 0930

MS LaCASSE: Mr. Chair, we are ready to resume.

THE CHAIRPERSON: Okay. Please proceed with the affirmation.

--- Pause

THE CHAIRPERSON: Mr. Ignasiak.

MR. IGNASIAK: Despite the glitch, I’ve never seen that process go that quickly. That’s excellent.

Let me start then, Mr. Chair. I will introduce the witnesses. Mr. McFadyen will then deliver an opening statement. I imagine that first part will take about an hour, give or take ten minutes. I suspect we will then be in a good position for a break and we then have some direct evidence to go through that will likely take us close to the noon hour or thereabouts.

So that’s how we see the morning unfolding.

And just so you know, Mr. Chair, before we release the panel over for cross-examination, I will want to have a break with the panel for a few moments just to check a few things, if that is okay and works with the schedule, and then we will turn them over for cross-examination.
THE CHAIRPERSON: Yes, that’s fine, Mr. Ignasiak.

MR. IGNASIAK: Thank you.
All right. I will start with Mr. Kieron McFadyen, who is sitting here closest to me. He is a Senior Vice-President of Teck’s Energy Business Unit and will be the lead company witness for this hearing.

Mr. Lyndon Chiasson is sitting next to Mr. McFadyen. He is a Director of Engineering with Teck’s Energy Business Unit. Mr. Chiasson has primary responsibility for all technical aspects of Teck’s Frontier Project.

Seated to Mr. Chiasson is Mr. Wayne Speller. He has appeared before numerous joint review panels previously. He is the Project Director at Golder Associates. Mr. Speller has primary responsibility for the preparation of the Environmental Impact Assessment for the project.

Seated next to Mr. Speller is Dr. Robin Johnstone. He is the General Manager of Community and Indigenous Affairs with Teck’s Energy Business Unit. Dr. Johnstone will address indigenous and community consultation matters for the Frontier Project.

Seated next to Dr. Johnstone is Mr.
Reid Person. He is a Senior Air Quality Engineer and Technical Leader for Atmospheric Sciences at Stantec Consulting. Mr. Person conducted the Air Quality Assessment for the Teck Frontier Project. He will be able to speak to any air quality issues that arise.

Seated next to Mr. Person is Mr. Bart Koppe. He is a Senior Environmental Health Scientist with Intrinsik Corp. Mr. Koppe was the lead on Teck’s Human Health Risk Assessment and Wildlife Health Risk Assessment. Mr. Koppe will be able to speak to issues related to human health and wildlife health.

Seated next to Mr. Koppe is Mr. Pearce Shewchuk. He is a Principal with Nichols Applied Management Inc. Mr. Shewchuk prepared a report regarding the issue of cost/benefit analysis that was submitted with Teck’s September 12 Reply Submission and marked as Exhibit 504, Attachment 2, beginning at page 234. He can also speak to any socio-economic issues that arise.

Going to the second row, behind Mr. Shewchuk at the end, is Mr. Ian Gray. Mr. Gray is a Principal with Nichols Applied Management. He was involved in Teck’s Socio-economic Assessment and is able to speak to socio-economic issues that may arise.

Seated next to Mr. Gray is Ms Anna
Brace. She is a Traditional Study specialist with Golder Associates. Ms Brace was involved with leading the Traditional Land Use Assessment and is available to speak to TLU issues that may arise.

Seated next to Ms Brace is Mr. Jerry Vandenberg. He is a Senior Environmental Chemist with Golder Associates. He directs monitoring, modelling and research for assessing environmental impacts. Mr. Vandenberg will be able to speak to water quality issues such as those involving rivers, lakes and pit lakes.

Seated next to Mr. Vandenberg is Dr. Getu Biftu. He is a Senior Water Resources Engineer with Golder Associates. Dr. Biftu specializes in surface water hydrology and environmental impact assessments. Dr. Biftu will be able to speak on any surface water hydrology issues that arise.

Seated to Dr. Biftu is Mr. Derek Ebner. He is a Senior Wildlife Biologist at Stantec Consulting. Mr. Ebner was involved with the preparation of Teck’s Wildlife Assessment, including project-specific wildlife monitoring and mitigation plans. Mr. Ebner will be speaking to any wildlife issues that arise.

Seated next to Mr. Ebner is Mr. Martin Jalkotzy. He is a Senior Wildlife Ecologist with Golder Associates. Mr. Jalkotzy is a practising wildlife
biologist with more than 40 years’ experience in the profession, including several years working with bison in the Northwest Territories. Mr. Jalkotzy is lead for Teck’s updated Wood Bison Assessment and is also a technical advisor on the Ronald Lake Bison Herd Technical Team, which the Panel will be hearing more about. Mr. Jalkotzy will be able to speak to issues regarding bison.

Seated next to Mr. Jalkotzy is Mr. Dave Brescia. He is a Senior Regulatory and Environmental Advisor with Stantec Consulting. Mr. Brescia prepared Teck’s Vegetation and Wetlands Assessment Update and Teck’s Closure Conservation and Reclamation Plan. Mr. Brescia will be able to speak to issues involving environmental impact assessment issues, particularly related to wetlands and reclamation.

Seated next to Mr. Brescia is Mr. Steven Hilts, he’s a Director of Environmental Legacies with Teck. Mr. Hilts is responsible for the assessment and management of legacy environmental facilities and the creation of new positive legacies in biodiversity. Mr. Hilts will be speaking to the environmental legacy issues that may arise.

Seated next to Mr. Hilts is Mr. Neil Sandstrom, he is a Manager of Environment with Teck.
Mr. Sandstrom is a registered professional engineer and
will be speaking to environmental issues.

Seated next to Mr. Sandstrom is Ms Kristen Sibbel. She is a Process Engineering Supervisor with Teck. Ms Sibbel will speak to any process engineering requirements, including project development and process plant studies.

Sitting next to Ms Sibbel is Mr. Michael Di Marco, he is a Manager of Mine Engineering with Teck’s Energy Business Unit. Mr. Di Marco is responsible for and will speak to issues regarding mine planning, tailings planning, and geotechnical design of Teck’s oil sands project.

Seated at the end of the second row next to Mr. Di Marco is Dr. Dejiang Long. Dr. Long is a Senior Water Resources Engineer with Golder Associates. He specializes in mine water management, hydrology, hydraulic engineering, water supply, environmental hydraulics, river engineering, flood management, and other water resource-related engineering. Dr. Long will be able to speak to issues arising regarding water resources and water management for the park.

All right, going over my right shoulder, Mr. Chairman, Ms Janais Turuk, she is a Manager of Teck’s Community Relations Group. Ms Turuk
is a Community Relations Practitioner and will be speaking to Indigenous and community consultation issues.

Next to Ms Turuk is Ms Yvonne Walsh, she is a Director of Teck’s Community and Indigenous Affairs. She’ll be speaking to Indigenous and community consultation issues.

Mr. Chris Bjornson, behind the wall of binders, is a Senior Fisheries Biologist with Goldar Associates. Mr. Bjornson specializes in aquatic biology and will be able to speak to issues regarding aquatic life impact, mitigation design, and fish habitat compensation.

Mr. Ivan Whitson -- my apologies, it’s Dr. Ivan Whitson, he is a Director of Whitson Innovations Inc. and is a subcontractor with Stantec Consulting. Dr. Whitson specializes in soil quality measurements and analysis in pipeline reclamation planning. Dr. Whitson will be able to speak to any issues relating to soil that arise.

Mr. Jonathan Chui is sitting next to him, he is a Senior Noise Specialist with Stantec Consulting. He specializes in noise impact assessment and noise control. He’ll be addressing arising that relate to noise.
Two more, sir.

Mr. Scott Donald is a Principal and Senior Hydrogeologist with Golder Associates, he specializes in numerical, analytical, and statistical analysis of hydrogeological processes. Mr. Donald will speak to any hydrogeological or groundwater modelling issues that may arise.

Sir, I believe our last witness, Dr. Richard Sisson, he is a Principal Geotechnical Engineering with Sisson Geoconsulting LLC. He specializes in geotechnical engineering, including independent review of tailings facilities, dam safety, and slope stability assessment and analysis. Dr. Sisson will be able to speak to any issues regarding geotechnical aspects of tailings behaviour and storage facilities.

I believe that’s 26, sir. The CVs for these witnesses are on the record at CEAA Registry 504, Appendix B, beginning at PDF page 63.

Mr. McFadyen --

MS LaCASSE: Sorry to interrupt. I think we have to take a short break again. There’s been another glitch with regard to the swearing in of the witnesses. So if we could have 10 minutes please. I’m sorry to interrupt.
THE CHAIRPERSON: Okay. Sorry, let’s take a 10-minute break.
--- Upon recessing at 0941 / suspension à 0941
--- Upon resuming at 0956 / reprise à 0956

THE CHAIRPERSON: Sorry about the interruption, Mr. Ignasiak.
Ms Lacasse.

MS LACASSE: Mr. Chair, it appears we have to have the witnesses reaffirm. There was a complication the first time around. So I’m going to ask Ms Doebele.

MS DOEBELE: In my role as Notary Public and for the Province of Alberta, I’m going to administer an affirmation.

Can anyone indicate if they’re not prepared to make an affirmation today?

Seeing nobody objecting, can you please raise your right hand. Do you promise the contents of your evidence contains the truth, the whole truth, and nothing but the truth, and solemnly affirm that this promise is binding on your conscience?

MULTIPLE SPEAKERS: I do.

AFFIRMED: KIERON McFADYEN
AFFIRMED: LYNDON CHIASSON
AFFIRMED: WAYNE SPELLER
AFFIRMED:  ROBIN JOHNSTONE
AFFIRMED:  REID PERSON
AFFIRMED:  BART KOPPE
AFFIRMED:  PEARCE SHEWCHUK
AFFIRMED:  IAN GRAY
AFFIRMED:  ANNA BRACE
AFFIRMED:  JERRY VANDENBERG
AFFIRMED:  GETU BIFTU
AFFIRMED:  DEREK EBNER
AFFIRMED:  MARTIN JALKOTZY
AFFIRMED:  DAVE BRESCIA
AFFIRMED:  STEVEN HILTS
AFFIRMED:  NEIL SANDSTROM
AFFIRMED:  KRISTEN SIBBEL
AFFIRMED:  MICHAEL DI MARCO
AFFIRMED:  DEJIANG LONG
AFFIRMED:  JANNAIS TURUK
AFFIRMED:  YVONNE WALSH
AFFIRMED:  CHRIS BJORNSON
AFFIRMED:  IVAN WHITSON
AFFIRMED:  JONATHAN CHUI
AFFIRMED:  SCOTT DONALD
AFFIRMED:  RICHARD SISSON

MS DOEBELE:  Thank you.
THE CHAIRPERSON:  Please proceed, Mr.
MR. IGNASIAK: Thank you, Mr. Chair.

Mr. McFadyen, on July 13, 2018 Teck filed its hearing submissions, which are marked as CEAA Registry Document No. 465. In that hearing submissions the materials Teck is relying on in support of its application is listed on PDF 6 through PDF 14, inclusive.

This includes: the Integrated Project Application filed in November 2011; a number of information request responses to the Agency and the Alberta Energy Regulator; the project update filed in June 2015; information request responses to the Joint Review Panel; Teck’s responses to a number of different stakeholders; and, other documents.

Mr. McFadyen, can you confirm that the hearing submission, Document No. 465, all the documents listed in PDF 6 through 14 of the hearing submission, and Teck’s reply submission filed September 12, 2018 and marked as Registry Document No. 504, were all prepared by Teck and under its direction or control?

MR. McFADYEN: Yes, they were.

MR. IGNASIAK: Are there any corrections you wish to make to the evidence?

MR. McFADYEN: No.
MR. IGNASIAK: Is the evidence accurate to the best of your knowledge or belief?

MR. McFADYEN: Yes.

MR. IGNASIAK: Do you adopt the contents of this evidence as Teck’s evidence in this proceeding?

MR. McFADYEN: I do.

MR. IGNASIAK: Thank you, Mr. McFadyen. I believe you have an opening statement you’d like to deliver?

MR. McFADYEN: I do, thank you.

So, Mr. Chair, Joint Review Panel members, Elders, Chiefs, Métis Leaders, Government representatives, Panel Staff, ladies and gentlemen, good morning and thank you for being here today.

Firstly, I would like to take the opportunity to recognize your coming here today on the lands of the Treaty 8, First Nations, and on the lands of the Dene, Cree and Métis people. Thanks for having us there today.

My name is Kieron McFadyen and I’m Senior Vice-President, Energy, for Teck Resources Limited. In that role I’m accountable for leading Teck’s energy business. This includes the responsible development of oil sands assets.
By background and by education I’m an engineer. I have more than 30 years of technical, operational, and commercial experience within the global oil and gas business.

Prior to Teck, I held numerous positions within the energy industry, including Executive Vice-President and President, Upstream Oil & Gas with Cenovus Energy based in Calgary.

Prior to Cenovus, I was Group Vice-President, Non-Operated Joint Ventures with Royal Shell PLC.

I've worked in many countries, including Holland, Oman, UK, Malaysia and, of course, Canada.

I've been involved in various roles, including major project development and major project execution.

Mr. Chair and Panel, I'm the executive in Teck accountable for the development and execution of the Frontier project. I will be in attendance every day through these proceedings and, as a result, I will chair Teck's panel.

I do have a very capable and experienced leadership team, and my team and I look forward to applying our know-how and experience to
Frontier and building on the strong relationships we already have with indigenous communities.

I would also like to say that, in line with our company values, we will continue to play a role in this process in an open, respectful and professional way.

I would now like to briefly introduce my colleagues here on the front row.

Mr. Lyndon Chiasson. Mr. Chiasson is a mining engineer with about 30 years oil sands mining experience, mainly in senior operational, senior technical and major project roles.

Dr. Robin Johnstone. Dr. Johnston has a PhD in wildlife ecology and has about 30 years experience working in environmental monitoring and indigenous consultation in Alberta, British Columbia and the Northwest Territories.

And finally, Mr. Wayne Speller. Mr. Speller is an environmental engineer with Golder Associates. He has 19 years experience in environmental consulting.

And Panel, as you can see, we also have a group of highly-dedicated experts who are looking forward to bringing significant value and insight to our project application.
As you know, in support of our Application we've filed extensive information and assessment. In this opening statement, we will be focused on providing the Panel with the information on the following.

Firstly, an overview of Teck, our values and our commitment to responsible development. Secondly, a summary of Frontier and its benefits for the region, the province and, indeed, the nation.

And thirdly, I will provide an overview of our extensive indigenous consultations and consultations with government and other stakeholders.

And lastly, I will speak to a number of environmental and social issues that have been raised in relation to the project.

Panel, I estimate that this opening statement will take about 45 minutes.

Now for a few comments on Teck.

Teck is a proud Canadian company, with roots stretching back more than one century. Our history and, indeed, the history of our industry is well covered in a fascinating book published by our Chairman, Dr. Norman Keevil. This book is entitled "Never Rest on your Ores - Building a Mining Company - One Stone at a Time".
Today, Teck is now Canada's largest diversified resource company. It's headquartered in Vancouver, with offices around the world, including our energy business unit, which is based in Calgary.

Our major business units are focused on providing materials that are foundational to modern society. Our business units include our copper business, our steel-making coal business, our zinc business and, of course, energy.

Teck employs more than 10,000 people worldwide. This includes over 8,000 staff in western Canada alone. And today, we are traded on the Toronto and New York stock exchanges.

We own or we have interested in producing operations in North and South America. And significantly, this includes a 21.3 percent ownership of the new Fort Hills facility and 100 percent ownership of the Frontier Project is that is subject to these proceedings.

So over 100 years in business, Teck has established a strong set of core values that define who we are as a company and help guide every decision that we take. These six values establish the standard for how we interact with indigenous people, our business partners and, indeed, each other.
Firstly, safety. Safety is the top consideration and, put simply, our vision is that everybody goes home safe and well every day.

Next we have integrity. We are honest, we're ethical, and we're fair in all our dealings.

We're also respectful. We value diversity and treat everyone with respect.

We strive for excellence. In fact, we crave for continuous improvement in all that we do.

We are courageous. We are true to our convictions and have the courage to speak up to ensure that our values are upheld.

And finally, Panel, we act sustainably. We ensure that our activities are socially and environmentally responsible.

Panel, each of these values is core to Teck, but for now I want to focus on sustainability and our approach to responsible development.

Sustainability is embedded in Teck's operational practices, and we are proud to be at the forefront of responsible and sustainable resource development. This includes being one of the first mining companies to set long-term quantifiable targets in areas such as greenhouse gas reduction, pioneering best practices in mining, and making significant
contributions to the communities where we actually work.  

In 2011, we launched a sustainability strategy that established ambitious long-term goals for our social and environmental performance out to 2030.

We have established goals in six focus areas; namely community, water, our people, biodiversity, energy and climate change, and air quality. Achieving these goals is central to all the work that we do.

We report our progress against these goals in our Annual Sustainability Report.

And Panel, Teck's commitment to sustainability has led to significant benefits for our employees, for our communities and, indeed, for the environment.

I would now like to list a few examples, if I may.

At our Cardinal River mine here in Alberta, the bighorn sheep population on reclaimed land is so robust that sheep have now been relocated to re-establish herds in other parts of North America.

Next, Teck has signed the Paris Pledge for Action that supports reducing emissions and achieving objectives of the Paris Agreement. In line with this pledge, we have worked hard to reduce
greenhouse gas emissions across our operations by over 280,000 tonnes since 2011. Roughly, this is equivalent to taking some 60,000 cars off the road. And finally, in Teck's operations today, 80 percent of our electrical power needs come from renewable sources. And our progress has been recognized nationally and also internationally. Very recently, Teck was named to the Dow Jones Sustainability Index for the ninth consecutive year. This index recognizes that Teck's sustainability practices are in the top 10 percent of the largest 2,500 companies in the S&P Global Broad Market Index. In fact, we scored the highest in several categories, including environmental policy and management systems. Teck was also recently named one of Canada's Top 50 Corporate Citizens for the 12th consecutive year, and this award came from Corporate Knights based on our -- again our social and environmental performance. And our achievements in reclaiming mine sites have garnered us over 70 separate awards in Canada, the United States and Chile. I think this is a clear demonstration
of our leadership in mining, but that's not to say that we are perfect, Chair. We are not, and we have had some challenges over our long history.

When things don't go to plan, we consistently have shown that we've committed to doing the right thing by being open, by being transparent and remaining responsible. We don't walk away. And Chair, I just want to stress that we are committed to the long term.

Now, in addition to our sustainable approach to development, technology and innovation are key to how we operate and, in fact, central to our DNA. Teck has a long industry of innovation in the mining industry that stretches back decades. Many technologies are now standard -- many of the technologies that are now standard in global mining were actually pioneered by Teck. And again, if I may, a few examples.

Example 1, airborne magnetic surveys used to model the sub-surface and understand the geology of the resource.

Second example, differential froth flotation used to recover different elements from the same production stream. And more recently, very recently, the use of smart shovel-mounted sensors to
help us tell valuable ore from waste rock, all directly done at the mine site -- actually, at the mine face.

And Panel, you may be surprised to know that the walkie-talkie was in fact invented in 1937 by a Teck employee, a trial operation. And, of course, now that enables safe remote working. And that spirit of innovation holds true today; we remain absolutely focussed on developing and implementing new methods and technologies to make our work safer, more efficient and, hence, more sustainable. We will bring this passion for innovation and technology to the frontier project.

On that point, Teck is a founding member of Canada’s Oil Sands Innovation Alliance, namely COSIA. COSIA is focussed on accelerating the pace of environmental performance improvements in oil sands through innovation and collaboration. And, since its launch in 2012 COSIA has shared over 1,000 distinct technologies across our industry. These technologies are aimed to improve tailings management which impacts on air, land and water.

I want to stress again, Panel, Teck is a very active participant in COSIA. In fact, we’re leading work on mine recognition, bison research, fluid tailings treatment, and the use of heat recovery technology to reduce greenhouse gas emissions, to name
but a few.

Mr. Chair and Panel, as I mentioned, we are a valued partner in Fort Hills alongside Total and Operator Suncor. From the start, we have been a very proactive partner in Fort Hills bringing our experience in large-scale mining to bear. And, as you may know, construction at Fort Hills began in October 2013 and first oil was achieved at the beginning of this year. In our view, Fort Hills is a world-class operation that has exceeded expectation for ramp-up to full production later this year.

Like Frontier, Fort Hills uses a paraffinic froth treated process, we call it PFT, and I guess you can understand why. The process lowers the intensity of greenhouse gas emissions compared to traditional oil sands extraction. Reducing emissions is critical to ensure that the production of Canadian oil sands remains globally sustainable. And, Panel, Teck is proud of our participation in Fort Hills and we commend Operator Suncor for their excellent performance in bringing this world-class environmentally responsible development online.

If Frontier is approved, we look forward to incorporating that practice and the learning gained through our involvement in Fort Hills.
And now, Panel, I want to provide a very brief overview of Frontier. Firstly, the Project is located 110 kilometres north of where we are today, 60 kilometres north of Fort McKay and some 110 kilometres south of Fort Chipewyan. The leases are within the mineable oil sands area, the area that the Government of Alberta has identified for long-term resource development.

The Project was originally applied for in 2011. At the time the overall design consisted of two distinct development areas separated by leases owned by Shell. In 2013 Teck and Shell agreed to exchange leases and this resulted in a more workable set of leases for both companies. This consolidated lease required us to update the Project design and as a result we filed a Project update in 2015.

Major improvements as described in the update resulted in, and I’ll list a few:

Reduced overall footprint of the project area;
Lower greenhouse gas emissions;
Lower water use intensities;
Enhanced tailings management that supports progressive sight reclamations; and, finally,
Increased resource recovery, thereby
improving project economics overall.
And, I think it is worth stressing,
Panel, that in order to be fully transparent with all
parties we applied for the recovery of the entire
resource base with no future expansions contemplated for
Frontier. The Project there aims to recover some 3.2
billion barrels of bitumen over 41 years. And, once
fully constructed, we aim to operate at a production
rate of 260,000 barrels per day.
The plan is to use truck and shovel
mining to excavate and transport overburden,
interburden, and ore. Ore will be transported to an
extraction facility consisting of an ore preparation
plant for ore crushing, slurry preparation and hydro
transport to the extraction plant. The extraction plant
will use primary separation cells. It will also use
primary and secondary floatation to produce bitumen
froth.
Similar to Fort Hills, the PFT process
will be used to produce a marketable product. As a
result, the Frontier Project will be amongst the lowest
greenhouse gas intensity of any Canadian oil sands
production.
Moreover, production will have a lower
greenhouse gas intensity than half of all the oil currently refined in the US.

As part of our tailings management plan, fluid tailings will be de-watered using centrifuge technology. Following de-watering the treated tailings will be deposited in pit and below ground level. This approach will improve the efficiency of water use, allow for progressive reclamation and result in no active tailings dam in the post-closure structure.

And, finally, Panel, as set out in our application, supporting infrastructure will include (7:12) transmission, another water intake system, access roads and bridge over the Athabasca River, a worker’s lodge, an air strip, and pipelines for water, natural gas, condensate and oil.

Now, Panel, I want to briefly cover the benefits of the Frontier Project. And we do recognize that resource development is based on balancing three factors: social, environmental and economic impact.

I will speak in more detail to the social and environmental factors later, but for now I would like to speak to the economics of Frontier. And, our focus has been to responsibly advance Frontier in order to meet three basic economic objectives. And, again, let me cover them:
Objective One, is to maximize the value of the product essential to everyday life.

Objective Two, generate significant economic benefits and opportunities for Indigenous peoples, local communities, for the province and indeed Canada.

Objective Three, responsibly create value for Teck shareholders.

I want to briefly touch on how we aim to achieve these objectives. Firstly, product demands. Global population will continue to grow. By 2040 it is estimated that 9 billion will live on this planet. In particular, developing parts of the world will see very significant population growth. And, again, by 2040 it is estimated that 2.5 billion people will be listed of low incomes and poverty. 2.5 billion, that’s almost two current day China’s.

It is only reasonable to assume that those increasing populations will in turn build their economies and improve their standard of living. As a result, global energy demand will increase. In fact, the International Energy Agency forecasts that oil demand will grow from 95 to 110 million barrels per day by 2040. This means that oil will remain a significant
part of the energy mix for the foreseeable future. And, Panel, as I mentioned, we believe that Frontier can play a key role in meeting that demand responsibly.

Frontier is also an economic engine for the region, the province and the nation. This project will create 7,000 direct jobs during the construction phase and a further two and a half thousand jobs during mine life. That’s 41 years.

Also, we estimated the project will stimulate new business development opportunities through local procurement, contacting, and service provision. And as part of this, we will work with Indigenous communities to develop employment and training programs.

And, in addition to jobs and economic growth, Frontier will contribute directly to government revenues at all levels in the amount of over $70 billion over mine life. This includes an estimated $12 billion in taxes to the federal government, some $55 billion to the province through royalties and taxes, and a further $3.5 billion to the region through property taxes.

Panel, these are significant public revenues that can be used to fund critical services such as healthcare and education. And, to help me put it into context, the taxes paid by Frontier would be enough to, for example, fund 10 million hospital stays.
Secondly, and again by example, 260,000 new family doctors.

It will also put 6 million children through school for a year, or completely fund all of Canada’s national parks for 50 years. I think it is important that we recognize that this is a very significant contribution.

Regarding Teck and our shareholders, I want to be very clear, we view Frontier as a very strong fit with our strategy, our core capability and our core competence. It is a long-life, high-quality asset. It's in a stable and progressive jurisdiction with access to a world-class supply chain and workforce. Frontier is not only an energy project, it's a mining project, and Teck is a leading mining company. So, in summary, Panel, Frontier is a project that will help responsibly meet energy demand whilst generating significant value for the region, for the province and for Canada.

Now, I want to speak to the extensive consultation that Teck has undertaken with Indigenous communities most affected by the project.

And, Panel, I must emphasize how important this engagement has been for Teck, in keeping with our values and building upon a strong history of
Teck has an Indigenous Peoples Policy. This policy sets out a commitment to Indigenous peoples which, in addition to meeting the consultation requirements of Alberta and Canada, commits us to do the following:

1. build respectful relationships;
2. engage in early and meaningful dialogue;
3. integrate Indigenous people's perspectives and traditional knowledge into decision-making;
4. identify ways to support Indigenous people in achieving their own self-defined community goals; and finally,
5. working to achieve the free, prior and informed consent of Indigenous communities.

The Indigenous communities which Teck is fortunate to work with are passionate about their rights, their interests, their land and their people. As you are aware, Teck has been engaging the local communities on Frontier since 2008 and during that time we've engaged with Indigenous groups on a scale ranging from basic notification to comprehensive consultation, accommodation and indeed agreement negotiation. Our
team has spent extensive time with Indigenous community members on the land, with technical experts and community leadership engaging in a dialogue about the project.

Today, to give you a flavour, we have held over 350 meetings with Indigenous community representatives; we have held over 20 mitigation planning workshops; we have conducted 20 project site tours and flyovers; we have supported 35 detailed technical reviews and submissions.

And, Panel, to help facilitate engagement, Teck has provided over $10 million in capacity funding to Indigenous communities. This funding has supported communities in hiring their own technical experts to, for example, help review the project and advise their communities, to help undertake their own assessments of the impacts on traditional land use and culture, using their own methodologies and approaches, and finally, to help facilitate their participation in project-specific mitigation planning.

Panel, through our consultations we have had extensive and meaningful dialogue, resulting in valuable feedback from Indigenous communities affected by the project. A number of aspects of our environmental assessment and project application were
changed in response to the input received.

Again, some examples. We changed the study area used to assess the potential impacts of the project on the Ronald Lake Bison Herd. Road options were selected to avoid sensitive areas such as the Birch Mountains. We made an early and very significant commitment not to place tailings in our pit lakes. We committed to implementing a fly-in/fly-out program for Fort Chipewyan to support Indigenous communities with employment opportunities whilst allowing traditional lifestyles to be maintained. And final example, we modified the project's water use plan to avoid withdrawals from local streams that flow into the Athabasca River.

In response to community feedback, as I mentioned, we have also committed to a contracting and hiring practice that focuses on qualified local Indigenous businesses, and I should note that we have a corporate policy that requires our contractors to do the very same.

Such benefits have already started to happen in relation to Frontier. For example, to date we've spent about $24 million on contracted goods and services with Indigenous companies. Our work to date serves as the basis of the establishment of
participation agreements with Indigenous communities most affected by the project and we see these kinds of formal agreements as creating a framework for even greater ongoing cooperation and clarify on important issues, including environmental stewardship and economic benefits.

Through our extensive engagement we have identified 14 Indigenous groups, both First Nation and Métis, that are affected by Frontier through proximity of traditional territory land use and other potential effects. Teck is delighted to inform the Joint Review Panel that we have now successfully concluded agreements with each of these Indigenous groups. Specifically, Chair, we now have agreements -- and if I may, I intend to list the following Indigenous groups where we have reached agreement, so bear with me:

- Athabasca Chipewyan First Nation
- Mikisew Cree First Nation
- Fort McKay First Nation
- Fort Chipewyan Métis
- Fort McKay Métis
- Fort McKay [sic] Métis 1935
- Fort McKay [sic] First Nation No. 468
- Métis Nation of Alberta Region 1 and its members Locals
- Athabasca Landing Local No. 2010
- Buffalo Lake Local No. 2002
- Conklin Local No. 193
- Lac La Biche Local No. 1909
- Owl River Local No. 1949
- Willow Lake Local No. 780

These agreements demonstrate that we have fully addressed all Indigenous community concerns associated with the project and concerns within our control. Chair, these agreements are comprehensive and are intended to last the project life. They capture vital commitments from Teck regarding mitigation of project effects on traditional land use and the environment. They also include provision of benefits through training, employment, contracting opportunities as well as financial payments.

Mr. Chair, we are pleased with the outcomes of our consultations efforts to date, but at the same time we recognize that this is only the beginning. We know that we must continue to implement our Indigenous Peoples Policy and maintain excellent relationships with our neighbours to provide further lasting benefit. And finally, we have committed to do just that. This includes supporting Indigenous, provincial and federal governments, working on
outstanding matters as part of issuing final approvals.
Tech has and will continue to be a constructive and
valued regional contributor to the implementation of
government-to-government resolutions.
Panel, I now want to turn to some
environmental aspects of the project.
When I began working in Canadian oil
sands it was very apparent to me that government plays a
very active role in the governance and oversight of this
industry. Today, mine operators must comply with
important directives, frameworks and regulations from
the Alberta Energy Regulator and the governments of
Alberta and Canada. These include the Tailings
Management Framework, the Carbon Competitiveness Incentive
Regulation, and the frameworks of the Lower Athabasca
Regional Plan. As a responsible developer, we will
comply with these government requirements and we will
continue to do our part in supporting regional
monitoring initiatives.

With respect to Indigenous communities,
one of the key reasons we have been able to reach
agreements is because we are committed to developing
Frontier in a responsible manner. This is evident, I
believe, in our comprehensive and robust Environmental
Impact Assessment for Frontier that considers the
extensive measures to mitigate environmental effects that we have proposed as part of the project submission.

That said, Panel, there are five important topics that have been raised during the review of Frontier that I want to speak to in this opening statement. They are the Ronald Lake Bison Herd, Wood Buffalo National Park, greenhouse gas emissions, water use, and finally, closure and mine reclamation.

Let me start with the Ronald Lake Bison Herd.

Let me say, Panel, we fully recognize and respect the importance of the Ronald Lake Bison Herd to Indigenous communities. We have listened and have carefully considered the concerns raised by Indigenous communities with respect to the herd. The main concerns centre on ensuring that the herd is viable for the long term and that Indigenous communities are able to hunt the herd in a sustainable way. That is why we have worked hard alongside Indigenous communities and government agencies for many years.

In fact, recognizing how important this herd is, we have gone well beyond just mitigating potential project impacts to the herd and our additional efforts have included -- and again, I will provide some examples:
- funding and support for additional studies of the Ronald Lake Bison Herd;

- support to the province towards the overall development of a Wood Bison Management Plan;
- advocating alongside First Nations for the listing of the herd under the Wildlife Act, which has prohibited non-Indigenous hunting; and finally,
- supporting efforts led by Mikisew Cree First Nation to establish a Conservation Stewardship Area south of Wood Buffalo National Park.

Panel, Teck is uniquely positioned to partner in ongoing efforts related to the herd as an operator in the region. To date we have provided over $2.5 million towards an improved understanding of the herd. We are also committed to the continuing participation in, and funding of, the Ronald Lake Bison Herd Technical Team. This group is mandated to draw expertise from its multi-stakeholder membership to identify and gather knowledge that will contribute to the sound management of the herd and its range.

In addition, Teck has developed a project-specific mitigation, monitoring and adaptive management plan specific to the Ronald Lake Bison Herd. This plan includes very explicit mitigation measures.
that we will undertake, for example, limit the size of
disturbances, implement ongoing reclamation to create
high-quality bison habitat, and also create safe
wildlife movement corridors.

Panel, it is also important to note
that one of the most significant risks to the herd is
disease transmission from bison in Wood Buffalo National
Park. This risk is not new; it has existed since
diseased bison were introduced into the Park nearly a
century ago. Our extensive work and assessment has
shown that the Frontier Project will not increase the
risk of disease transmission.

To reiterate, Panel, we are very keen
to continue to play our part to promote the long-term
sustainability of the herd.

I would like to now speak to Wood
Buffalo National Park World Heritage Site and the
Frontier Project.

Let me begin by saying that we fully
respect the ecological and cultural significance of the
Park. As part of our environmental assessment we
conducted a comprehensive review specifically on
potential impacts to the Park, the first proposed oil
sands development to do so. This assessment concluded
that potential effects of Frontier on the "outstanding
universal value" of the park would be negligible and would not impact the integrity of the Park.

As I mentioned, we fully support the MCFN lead initiative to create a Major Conservation Stewardship area at the Park's southern boundary. Also, the Government of Canada is developing an Action Plan to ensure the Park's outstanding universal value is protected for generations to come. This was one of the recommendations of the World Heritage Committee. And, Panel, again, Teck is very keen and very supportive to continue to play our part.

I now very briefly want to cover greenhouse gas emissions. And again, let me duly recognize that climate change is a major global challenge.

As I mentioned earlier, our focus is on helping meet energy demand by developing Canada's oil resources in the most responsible way. This includes incorporating industry-leading practices for responsible development, including the latest technologies and methods to reduce greenhouse gas emissions. These include the use of cogeneration for heat and power needs, and the PFT process that I mentioned earlier.

Reiterating -- and I think it is worth reiterating -- this process reduces the carbon content
of our oil at the mine site, producing a better quality product that can be transported efficiently to market. As a result of these measures, Frontier's production is amongst the lowest greenhouse gas intensity of any Canadian oil sands production.

Again, bear with me but I do think it is also worth re-stressing that Frontier will have a lower greenhouse gas intensity than half of all the oil currently refined in the U.S.

Finally, I do want to say that Teck supports action at all levels to combat climate change and we advocate strongly for efficient and effective climate action policies.

As the Province and Canada advance details of their own climate action plans, including the 100-megatonne annual limit on emissions from oil sands, we remain very confident that Frontier will fit within the annual limit and compete from a greenhouse gas intensity point of view in Canada and globally.

Panel, I would now like to highlight a few aspects of Frontier's water use.

Firstly, Frontier will be amongst the lowest river water use intensities in the oil sands, with an average of 1.9 barrels of river water per barrel of bitumen produced. This compares to an industry
average of 2.5.

Also, the Frontier Project's Water Management Plan aligns with the Surface Water Quantity Management Framework for the Lower Athabasca River.

Added to this, Frontier has been designed to allow storage of water to support operations for four months or more. This allows us to stop water withdrawals during periods of low river flow.

Our overall water management plan is described in detail in the Hydrology and Water Quality Mitigation, Monitoring and Adaptive Management Plan for the Frontier Project.

Mr. Chair, turning to closure and reclamation.

In the past, reclamation planning was done only towards the end of the mine's life. Today, we begin reclamation planning at the start, before mining begins. We also carry out progressive reclamation, which means that we reclaim portions of the site while mining continues in other parts of the site. This allows for shorter timeframes to return land back for traditional and other uses.

To ensure that reclamation goes as planned we have developed a Reclamation Monitoring Plan. This plan will be routinely updated in cooperation and
collaboration with Indigenous communities and regulators. Monitoring will include vegetation, landform stability, as well as the quantity and quality of surface and groundwater draining through the system. Collected information will be integrated and analyzed to ensure success of reclamation.

Panel, our overarching goal is to support the development of a diverse, self-sustaining, locally common boreal forest landscape.

Mr. Chair and Joint Review Panel Members, I will conclude.

The Frontier Application before you is one of the most comprehensive in the history of oil sands development in Canada. It's a culmination of 10 years of in-depth consultation and detailed assessment. Together with Indigenous communities affected by the project, we have executed agreements that provide a framework for even greater cooperation going forward.

Crucially, if approved, the Frontier Project will deliver over $70 billion to Canada in the form of tax revenues and royalties over the project's life. These are significant funds that can support investment in education, healthcare and more.

Panel, we believe in Frontier. It's a world-class project that Teck can develop responsibly
and competitively. We are therefore seeking your considered recommendation to proceed with the project.

I would now like to thank our Indigenous partners, the Joint Review Panel, Panel staff, government representatives, other stakeholders, and of course my team. Without the hard work, extensive participation and feedback from such a diverse group, this project would not be where it is today.

Chair, this concludes our opening statement.

MR. IGNASIUK: Thank you.

Mr. Chair, I think it might be a good time for a break but I did have one question I just wanted to ask the witness before we break.

Mr. McFadyen, you listed off 14 Indigenous groups during your opening statement. You referred to the Fort McKay Métis 1935 and the Fort McKay First Nation No. 468. I understand those were meant to be references to Fort McMurray Métis 1935 and Fort McMurray First Nation No. 468; is that correct.

MR. McFADYEN: So, Chair, if I made a mistake there, I apologize. I think I made a mistake.

MR. IGNASIUK: Thank you.

THE CHAIRPERSON: Thank you. So we'll
take a break now. We'll break for 20 minutes. It looks like it's just a little after a quarter to, so around five after 11:00 we will resume. Thank you.

--- Upon recessing at 1047 / Suspension à 1047
--- Upon resuming at 1109 / Reprise à 1109

THE CHAIRPERSON: Please be seated.

Mr. Ignasiak, before you get started, there's a few matters I'd like to deal with, if that's okay.

So I understand there's some parties who arrived a bit late. I understand that there's somebody here who may be wanting to just make sure Council of Canadians, Stand.earth, and Sierra Club are registered. Is that part in the room right now, and if so, could you come forward.

MR. HUDEMA: Yeah, I just wanted to register. My name is Mike Hudema. I'm here to register on behalf of the Council of Canadians, Stand.earth, the Western Canadian Wilderness Committee, and the Sierra Club.

THE CHAIRPERSON: Okay, thank you, Mr. Hudema.

And I also understand there's a group I think of trappers here, Peter Hoffman and others. Peter, do you want to step forward?

MR. HOFFMAN: Okay. Yeah, thank you.
My name is Peter Hoffman and I and a few trapping partners would like to have the opportunity to address this hearing. And that's why we're here registering late, because we were ill-informed of the schedule.

THE CHAIRPERSON: Okay, thank you. We'll look for an opportunity to schedule you in and we'll let you know. Does Secretariat staff have a way to get a hold of you?

MR. HOFFMAN: Yes, I provided them with a phone number and email address.

THE CHAIRPERSON: Okay.

MR. HOFFMAN: And they can notify me --

THE CHAIRPERSON: Okay, thank you.

MR. HOFFMAN: -- of the schedule.

Thank you.

THE CHAIRPERSON: Thank you, Mr. Hoffman.

And I understand George Clark also wanted to speak to the Panel.

MR. CLARK: Mr. Chairman, George Clark, Trapline 2939. I'd like to register as well.

THE CHAIRPERSON: Okay, thank you, Mr. Clark. We'll look for an opportunity for you as well. And do we have a way to get a hold of you as well?

MR. CLARK: Pete has my information.
THE CHAIRPERSON: Okay.

MR. CLARK: Thank you.

THE CHAIRPERSON: Thank you.

Sorry, you gentlemen ...

MR. D. SHEVOLUP: My name is Darryl Paul Shevolup I am the senior holder of Trapline 2346, and yeah, I'd like to testify at these hearings.

THE CHAIRPERSON: Okay, so we'll look for an opportunity for you.

MR. D. SHEVOLUP: Thank you.

THE CHAIRPERSON: And do we have a way to get a hold of you?

MR. D. SHEVOLUP: Just by phone only or by mail -- by box. I don't believe in technology that way. I'm old school.

THE CHAIRPERSON: Okay, that could raise a bit of a challenge for us, but make sure you have our phone number --

MR. D. SHEVOLUP: However, Peter Hoffman is --

THE CHAIRPERSON: He's going to --

MR. D. SHEVOLUP: He's going to take care of the correspondence if it has to be done that way.

THE CHAIRPERSON: Okay.
MR. D. SHEVOLUP: Thank you.

THE CHAIRPERSON: Thank you.

Sir?

MR. C. SHEVOLUP: Hello, my name's Chuck Shevolup. I'm junior partner with my brother, and I want to testify at these hearings.

THE CHAIRPERSON: Okay, and will we get a hold of you through Mr. Hoffman as well?

MR. C. SHEVOLUP: It would be the same way as -- and the Chip Band have my number too if they need to get a hold of me, but -- okay.

THE CHAIRPERSON: Okay, so we'll look for an opportunity to schedule you in as well. Thank you.

Any other matters before we get to carrying on with direct?

Seeing none, Mr. Ignasiak.

MR. IGNASIAK: Thank you Mr. Chair.

EXAMINATION IN-CHIEF

MR. IGNASIAK: Mr. McFadyen, I'd like to start with the Government of Canada submissions, which are marked as Registry Document -- or I'll say Exhibit 489. The Parks Canada Agency portion of these submission is located from PDF 380 to PDF 485. Parks Canada has made a number of recommendations and has also
reached conclusions on several specific issues.

Mr. McFadyen, can you provide the JRP
with Teck's views on Parks Canada's recommendations to
the Panel.

MR. McFADYEN: Yes, I would be happy to
provide our overall assessment on the recommendations
made by Parks Canada.

Teck's detailed position on these
recommendations is set out in writing in Teck's Reply
Submission, which was filed September 12th, which is
CEAA Registry Document 504.

Our specific responses to Parks
Canada's recommendations are at PDF 41 through to 52 of
that submission.

Mr. Chairman, you will note in our
written response to Parks Canada's recommendations that
Teck agrees, or agrees in part, with many of these
recommendations. We generally agree with those
recommendations that seek to have Teck monitor potential
project effects on bison, waterfowl, and migratory
birds. Teck also agrees that if the project proceeds,
it should continue to participate with the Ronald Lake
Bison Technical Committee and the Oil Sands Bird
Technical Committee.

However, there are several
recommendations that we do not agree with. In our view, Parks Canada is seeking to have Teck undertake activities that are not connected to the project and that are the responsibility of Parks Canada as managers of Wood Buffalo National Park. For example, Parks Canada recommends that Teck fund a study to assess the range, movements, and habitat use of diseased delta bison in Wood Buffalo National Park to inform mitigation planning.

Mr. Chairman, we predict that the Frontier Project will have no effect on diseased bison in the park and that the management of the park is squarely the responsibility of Parks Canada. As a matter of fact, Parks Canada has acknowledged for years that it needs to take steps to manage diseased bison in Wood Buffalo National Park. This is not an initiative that should be undertaken by Teck.

This recommendation regarding delta bison in the park is just one example of where we think Parks Canada's recommendations are not appropriate.

In addition, Mr. Chairman, we note that many of the issues raised by Parks Canada have also been advanced by Indigenous communities. In this regard, Teck has reached agreements with Indigenous communities, including ACFN and MCFN, regarding Teck's environmental
mitigation and management obligations regarding Wood Buffalo National Park and related issues including bison, water, and migratory birds. However, what really concerns us with Parks Canada's submissions are not the recommendations, but the conclusions that they have reached regarding the project's effects on Wood Buffalo National Park, the PAD, and other environmental components.

MR. IGNASIAK: One of those conclusions relegates to bison. Parks Canada states there are likely to be significant adverse effects to bison if the project is approved. Does Teck agree with this?

MR. McFADYEN: No, Chairman, we do not. And I will ask Mr. Speller to elaborate on why we think Parks Canada's conclusion is wrong.

MR. SPELLER: Mr. Chairman, for context, the Ronald Lake herd is disease-free, meaning they are free from bovine tuberculosis and brucellosis, unlike the Wood Buffalo National Park bison to the north, which carry both diseases.

I will be referring to Wood Buffalo National Park simply as "the park."

The risk of disease transmission from park bison to any disease-free bison heard is the greatest threat to wood bison recovery in Canada, as
identified in the Government of Canada's recovery strategy for the wood bison.

With respect to mitigation and management actions to reduce the risk of disease transmission, Teck has put forward a number of options that could be considered as part of overall cooperative management plan. Parks Canada has stated that "there are no proven additional mitigations to reduce the effects," in part because those put forward have questionable effectiveness.

Mr. Chairman, we respectfully disagree. As described in the federal wood bison recovery strategy, bison control zones are currently being used to keep disease-free herds separate from diseased park bison.

For example, the Hay-Zama bison herd has a bison control zone along the east side of the range in Alberta, and the Mackenzie Bison Sanctuary and the Nahanni herd range is separated from the park by a control zone administered by the Northwest Territories and supported by Parks Canada themselves. Fencing has been effectively used to keep bison within Elk Island National Park for decades. Fire management is considered a useful tool for bison habitat management in British Columbia and the Northwest Territories.
In short, there are effective mitigations available. However, the responsibility to deal with the risk of disease transmission from the diseased park bison lies with Parks Canada, Environment and Climate Change Canada (or ECCC, as I will refer to them), and other provincial and territorial governments.

Teck has stated their commitment to working with the responsible authorities to explore possible mitigation measures for which Teck has stated they are supportive but does not have the authority to implement independently.

Mr. Chairman, Parks Canada and ECCC agree with our assessment conclusion that there is a high risk of disease transmission from the diseased park bison to Ronald Lake herd today, with or without Frontier. Parks Canada, ECCC, and the Province of Alberta should be implementing mitigation measures to reduce this risk now.

Where we do not agree is what may happen if Frontier were to be constructed. Parks Canada, ECCC, and others have stated that the project will increase that risk of disease transmission because they believe Frontier will push the Ronald Lake bison herd north, farther into the park and into closer contact with diseased park bison.
Mr. Chairman, based on our extensive analysis, we do not predict this to happen. We predict that, although the project will displace bison from the project disturbance area, the project will not increase the risk of disease transmission.

Before I explain why we do not agree, let me describe the team that has done the analysis that has brought us to this conclusion.

Our analysis has been led by Martin Jalkotzy, sitting here behind me. Mr. Jalkotzy is a wildlife biologist with over 40 years' experience, including several years working with bison in the Northwest Territories. He is a member of the Ronald Lake Bison Herd Technical Team, sitting alongside representatives from ECCC, Parks Canada, Alberta Environment and Parks, Indigenous groups, and industry.

Mr. Jalkotzy has led a highly competent team to develop the analysis in front of the Panel today, including in-house experts on habitat suitability, connectivity, and population viability analysis modelling; bison researchers from the University of Alberta that work with the Ronald Lake Bison Herd Technical Team; as well as third-party biologists like John Nishi, a recognized expert in wood bison who recently updated the Alberta government's

Mr. Chairman, there are two reasons why the risk of disease transmission could increase, both associated with the herd moving farther north into the park. First, if the herd is food-limited in its range, then they may move to find additional food resources, and they could move north, although north is not their only option. Second, the herd could be displaced further north as a result of trying to avoid disturbance associated with the project, such as noise, light, or human presence. This includes increased predator risks. Or at its simplest, the herd may move farther north into the park if they run out of food or if they're scared north.

Mr. Chairman, our analysis concludes that neither of these should happen.

Let's start with food availability.

ECCC and our analysis agree that the herd is not currently food-limited. Our analysis shows that if you look at how much forage is in the herd's current range, and then you remove forage potentially lost due to the direct and indirect effects of Frontier, there remains sufficient forage for the herd to not only maintain itself but to grow.

ECCC's analysis does not agree with
this conclusion. However, our review of ECCC's carrying
capacity methods indicate that they made a number of
mistakes, as we describe in Attachment 5 to the
September 12 Teck Reply Submission, which is marked as
Exhibit 504, and begins on PDF page 330. Once
corrected, ECCC's carrying capacity estimates should
align with ours and demonstrate that the herd will not
be food-limited if the project were to be constructed.

With respect to the second reason,
disturbance, the notion that the herd will move farther
north into the park to escape project disturbance is not
in any way supported by existing evidence. First,
during Teck's drilling program, monitoring indicated the
herd did not abandon their core range immediately
adjacent to the drilling program. We know that across
their range in northern Canada, healthy wood bison herds
live in areas alongside human disturbance.

ECCC and Parks Canada suggest that
increased linear disturbance in the herd's range will
result in increased numbers of wolves and increased wolf
predation. Mr. Chairman, linear disturbances are few
north of the project area, and the project development
does not create a bunch of linear disturbance because it
is a mine, not a linear project. Our experts believe it
is highly unlikely that wolf densities will increase.
Therefore, Mr. Chairman, based on this our conclusion is that the Ronald Lake bison herd is unlikely to shift their range north and the risk of disease transmission will not increase as a result of the project.

Our conclusions regarding the herd’s abundance and range, habitat suitability and connectivity, carrying capacity, direct and indirect effects on mortality and supporting work is well grounded in science, is transparent and defensible and can be relied on by the Panel.

MR. IGNASIAK: Thank you, Mr. Speller. Parks Canada also concludes that the effects of the project on the outstanding universal value, or OUV for short, of Wood Buffalo National Park are likely to be adverse and reduce Canada’s ability to restore the desired outcomes related to migratory waterfowl.

What is your view on this conclusion?

MR. SPELLER: Mr. Chairman, we do not agree with this conclusion. Our assessment of the Frontier Project focused on changes in migratory waterfowl habitat and mortality risk, as well as changes in stopover habitat for migratory birds in the regional study area.
Our assessment concluded that the predicted effects on waterfowl would be of low environmental consequence in the regional study area. The predicted loss of habitat in this regional study area, which is on the flyway for migratory waterfowl on their way to the park, is not expected to affect migratory waterfowl populations in the park.

It is important to note that the project is not being built within the park and the project is not predicted to directly or indirectly affect migratory waterfowl stopover or breeding habitat within the park. Mortality risk from project infrastructure, including tailings areas, is also expected to have negligible effects on migratory waterfowl populations that breed, moult or stop over in the park. Our assessment included cumulative effects from all oil sands developments might have measureable effects. However, they are not expected to threaten sustainability of bird populations in the park.

Also, as supported by ECCC in their submission to the Joint Review Panel from August 31st -- and this is page ECCC 138 of their filing -- there is no research to support the idea that development in
mineable oil sands area is altering or shifting
migratory bird migration pathways to the park,
recognizing longer flight paths could affect the fitness
of these birds.

We recognize indigenous knowledge has
indicated a shift has been occurring for decades.

MR. IGNASIAK: Parks Canada also
states, at pdf 419 of the Government of Canada’s
submission, that with respect to migratory waterfowl --
and I quote:

“The predicted contributions from
the Project, including the
implementation of Teck’s proposed
mitigations, the effects associated
with contamination from tailing
ponds in the oil sands region,
including the project, will
adversely affect Wood Buffalo
National Park OUV and reduce
Canada’s ability to achieve/restore
the desired outcomes. While there
is uncertainty about the degree to
which contacts with tailing ponds
is causing mortality, it has
potentially significant effect to
the ecological integrity of Wood
Buffalo National Park and the Wood
Buffalo National Park outstanding
universal values.” (As read)

Does Teck have a response to this?

MR. SPELLER: Mr. Chairman, our
assessment acknowledges that there is a risk of
mortality for birds that come in direct contact with
tailings ponds. However, regional monitoring programs
indicate that the number of birds killed per year due to
interactions with tailings areas is small compared to
other sources of mortality.

Based on data recently collected by the
Oil Sands Bird Contact Monitoring Program, of the
thousands of birds observed landing in tailings areas
bird fatalities have averaged approximately 163 birds
annually between 2013 and 2015, for multiple oil sands
projects combined.

Bird fatalities associated with the
project, although regrettable, are not predicted to have
a measurable effect on sustainability of waterfowl
populations in north eastern Alberta, including the
park.

Mr. Chairman, Attachment 13 of our
September 12th submission helps provide some perspective
on the term “small”.

Ducks Unlimited estimate a North American waterfowl population at approximately 48 million. Ducks Unlimited also indicate duck harvest levels, meaning the number of ducks killed by hunters, at approximately 11 million. Understanding that approximately 23 per cent of waterfowl are allowed to be harvested as part of conservation efforts gives us the perspective that migratory bird mortalities due to the tailings ponds is small.

In addition, Attachment 29 of our September 12th submission contains a synthesis of human-related avian mortality in Canada from 2013, which indicates activities such as hunting and transmission lines are responsible for millions of shore bird and waterfowl kills annually.

This does not mean that bird mortalities in oil sands mines are not regrettable, but it highlights our conclusion that these numbers are small.

Based on this, our assessment concludes that the project mortality risk would have negligible effects on waterfowl populations using the park during migration or for breeding or moulting.

MR. CHIASSON: Mr. Chairman, I would
like to also add to Mr. Speller’s comments and point out that Teck is committed to implementing a bird deterrent system based on the best available technology. These systems are also recognized as a key component of waterfowl protection plans throughout the Mineable Oil Sands Area.

MR. IGNASIAK: With respect to whooping crane, Parks Canada has identified two issues. These are the loss of stopover habitat and the potential for whooping crane to be exposed to contaminants during migration.

Parks Canada states that the project and cumulative stopover habitat loss will have significant effects in ensuring that the whooping crane population reaches the recovery strategy goal and the eventual recovery and down-listing from an endangered species.

Parks Canada states that if the project is approved, even with the implantation of its recommendations, Parks Canada expects significant adverse environmental effects to remain due to the uncertainty in the effectiveness of the mitigations.

Could you please respond to this?

MR. McFADYEN: I will ask Mr. Speller to respond.
MR. SPELLER: Mr. Chairman, we do not agree with their conclusion, for several reasons.

First, our assessment has different conclusions. We concluded mortality risk due to the project and cumulative oil sands development is not expected to result in a change in abundance of the whooping crane population, although 2016 data from Bidwell et al suggests mortality risks could be higher than originally predicted in the Project Update. But this does not change our conclusion.

It is important to note that whooping crane breeding sites are 240 kilometres north of the project, and we did not identify a valid linkage between those breeding sites and the project.

Our assessment also concluded changes to stopover habitat might alter whooping crane distribution during migration. However, even with the consideration of the new whooping crane data, project effects are not expected to threaten the sustainability of the regional whooping crane population, nor affect the breeding populations in the park.

Second, Attachment 15 of our September 12th submission presents ECCC information on whooping crane from 2016 presented to the UNESCO Reactive Mission. ECCC concludes that all cranes migrate over...
the oil sands region but a small percentage stop over and most stopovers are short in duration. They also conclude survival during migration seems high and identify more data is needed. This is consistent with our assessment.

Finally, Parks Canada’s conclusions appear contradictory to their Strategic Environmental Assessment for Wood Buffalo National Park. The Strategic Environmental Assessment concluded a positive future trend for whooping crane populations, reaching the recovery strategy goal and also down-listing from their current endangered status.

Our understanding is these conclusions take into consideration future cumulative effects from oil sands development, including the Frontier Project.

As Mr. Chiasson mentioned a few minutes ago, Teck has stated their commitment to implement best available bird deterrent technology for the project and has drafted a Waterfowl Protection Plan to mitigate and monitor potential effects of the project.

In addition, as part of the September 12th submission to the Joint Review Panel, Teck did commit to investigate and implement, if possible, additional systems for deterring whooping cranes.

MR. IGNASIAK: Thank you.
ECCC has also made submissions regarding caribou. Specifically, ECCC recommended that Teck -- and again I quote:

“Develop and implement a compensation plan within the Red Earth caribou range prior to project construction to mitigate for permanent and long-term loss of caribou habitat. The compensation plan should target the restoration of linear disturbance features in the Red Earth range and be based on a minimum four-to-one reclaimed disturbed compensation ratio.” (As read)

Mr. Chiasson, can you please provide Teck’s view on this?

MR. CHIASSON: Mr. Chairman, we do not agree with ECCC’s recommendation.

First, we must reiterate that the project does not fall within the Woodland caribou ranges as defined by the Government of Alberta and the Government of Canada. Considering this, the project will not remove any habitat or displace any caribou from the Red Earth or the Richardson Herd Ranges.
However, we acknowledge that recent GPS collar data has shown that caribou from the Red Earth range moved through the project development area. This has been confirmed by indigenous knowledge provided by indigenous communities.

As part of their submission ECCC also asserted that a recent defined important area for the Red Earth herd in the Draft Provincial Woodland Caribou Range Plan, Government of Alberta 2017, which overlaps the northern portion of the terrestrial LSA, was evidence that the project directly impacted the Red Earth herd.

However, the regulatory significance of important areas for the caribou and how they will be incorporated into range plans is unclear.

As of right now these important areas are not part of the formal designated ranges and therefore should not be held to the same restrictions or expectations.

Lastly Teck is aware that the designated ranges for the Red Earth and Richardson herds might be updated as new information becomes available and, once finalized, Teck will assess the plans, recommendations and determine whether or to what extent they are appropriate to include in the project’s Draft
Wildlife Mitigation and Monitoring Plan and their relevance to the project’s Draft Biodiversity Management Plan.

Similarly when final arranged plans for the Red Earth, Richardson and west side of the Athabasca ranges become available, Teck, in collaboration with regulators and indigenous communities, will assess their recommendations and determine whether or to what extent they are appropriate to include in the project’s mitigation and monitoring plans and as part of Teck’s adaptive management process.

MR. IGNASIJA: Thank you.

Finally Parks Canada, at pdf 428 through 463 of the Government of Canada’s submission, discusses water quality and quantity in the Athabasca River and the pad and concludes that the project will likely significantly affect each of these in Wood Buffalo National Park.

Mr. Speller, can you comment on this?

MR. SPELLE: Yes, Mr. Chairman.

I will discuss our specific inclusions regarding water, including hydrology and water quality in a moment.

However, first I would like to identify an issue we have noted throughout Parks Canada’s
submission and conclusions.

Parks Canada appears to take the view that any change is deemed to be significant. However, without situating these findings and relevant thresholds or guidelines or ecological context, it inflates the effects of the project, in our view, exaggerates in the layperson’s mind what the project’s actual effects will be.

Our assessment looks at the changes predicted to occur due to the project and from cumulative development and assesses those changes through effects analysis and risk assessment to see if there is a potential adverse effect or risk to the outstanding universal value of the park.

Not every predicted change causes a significant effect or an adverse risk. So in many cases we predict a change, but that change is small and may not actually be perceptible. We have tried to put our predictions in a proper assessment context so reviewers can understand our perspective on which predicted changes matter and which ones are considered negligible.

Mr. Chairman, our approach is consistent with assessments Parks Canada has conducted for projects in World Heritage site parks, again noting that Frontier is not proposed to be built within the
Now with respect to the issue of hydrologic changes, the project is predicted to result in negligible changes in the Athabasca River flow and water level. We predict mean seasonal flow changes in the Athabasca River due to the project’s maximum water withdrawals will range from 0.3 per cent in summer to 1.56 per cent in winter. We predict the maximum flow depth change to be one centimetre at the most critical navigation point or Pinch Point on the Athabasca River, which is located adjacent to Poplar Point.

To put this one centimetre in context, we predict water level in the Athabasca River can decrease by 90 centimetres or increase by 28 centimetres, depending on predicted potential climate change scenarios.

These negligible changes in the Athabasca River flow are predicted to result in negligible changes to the hydrologic and water level conditions in the Peace Athabasca Delta.

We predict the change in Lake Athabasca water level due to the project is also approximately one centimetre. Under the influence of climate change only we predict the average increase in the Lake Athabasca water level could be 33 centimetres and the average
decrease could be 13 centimetres on an annual basis. Mr. Chairman, it’s important to note that our predictions assume the project is taking water at its maximum water withdrawal rate of 4.2 metres cubed per second all year long and throughout the mine life. The actual project water withdrawal rates will be required to be less than this most of the time during the mine life to comply with the Surface Water Quantity Management Framework.

Therefore, the predicted changes in flow in water levels I have just described, even though they are small, are still considered conservative.

With respect to the issue of water quality, Parks Canada has noted changes to water quality that are predicted to occur within Frontier’s local study area and has concluded that similar changes will occur within the Peace Athabasca Delta and the park.

Mr. Chairman, this is not correct. Multiple lines of evidence indicate that the project will have negligible effects on water quality within the Peace Athabasca Delta and the park.

Water quality models that simulate all relevant project effects within the local and regional watercourses and water bodies were used to support an effects assessment on aquatic, wildlife and human health
risk. The assessment shows that effects on all of these receptors will be negligible before any water has reached the park.

These conclusions are supported by monitoring programs, by industry, ECCC, Alberta Environment and Parks and community-based monitoring. Specifically ECCC has documented that water quality signals return to background levels well before entering the park, as shown in ECCC slides in Attachment 18 of Teck’s September 12th submission.

Community-based monitoring submitted by the Mikisew Cree First Nation has confirmed that all polycyclic aromatic hydrocarbons, which I will refer to as PAHs, are below relevant guidelines in the Athabasca River near the Delta.

And long-term monitoring by Alberta Environment and Parks confirms that although some water quality concentrations are above guidelines in the Lower Athabasca River, the same trends are observed upstream of oil sands development.

Similarly Parks Canada has expressed concern that aerial emissions of metals and PAHs could affect water quality in the Peace Athabasca Delta.

Several studies by researchers at the University of Alberta, Alberta Environment and Parks and
ECCC have consistently shown that the majority of aerial emitted metals and PAHs are deposited within 20 to 30 kilometres of the centre of oil sands mines and nearly all constituent concentrations declined to near background levels by about 50 kilometres, with no samples collected within the Peace Athabasca Delta measured at background levels.

While the project is located closer than other developments to the park and the Peace Athabasca Delta, it does not include the two major contributors to aerial PAH emissions, namely an upgrader or a coke piler, which have been estimated to contribute approximately 50 per cent or more to the deposition of PAHs associated with oil sands facilities.

Based on these lines of evidence and consistent with the air modelling of transport and deposition of metals and PAHs in the Project Update, the deposition of PAHs and metals in the park and the Peace Athabasca Delta are predicted to remain at levels that are consistent with background conditions.

The Project Update demonstrates that PAH and metal deposition in the park and the Peace Athabasca Delta result in no adverse human health, wildlife health or ecosystem effects.

MR. IGNASIAK: Thank you, Mr. Speller.
Next, there have been concerns raised regarding elevated cancer rates in the area due to oil sands development.

Can you please comment on whether Teck has done anything to address this issue?

MR. McFADYEN: I will ask Mr. Koppe to address this.

MR. KOPPE: Teck completed a comprehensive human health risk assessment of its Frontier Project. The HHRA followed an approach that’s consistent with guidance provided by regulatory agencies like Health Canada and the United States Environmental Protection Agency.

The HHRA included a detailed assessment of cancer risks in the region, including the community of Fort Chipewyan. The findings of the HHRA indicate that the cancer risks associated with the project are negligible.

We recognize that the risk of cancer is an ongoing concern in Fort Chipewyan and that the issue has been and continues to be studied by Alberta Health Services.

I was recently informed by Alberta Health Services that their follow-up report on cancer incidents in Fort Chipewyan was updated, as scheduled,
which includes data for the period between 1997 and 2016. Currently, the report is in the process of being shared with the community consistent with First Nations’ principles of ownership, control, access, and possession.

In keeping with these principles, Alberta Health Services informed me that it will be leaving it up to the community to decide whether the report will be shared more broadly.

MR. IGNASIAK: Thank you, Mr. Koppe.

Mr. Person, I understand your team was responsible for the Frontier air quality assessment. Could you please comment on what is required to conduct an accurate air quality assessment?

MR. PERSON: Air quality assessment of pollutants is an important input to evaluating human health risk and wildlife health risk. The accuracy of the predictions depend upon the accuracy and completeness of the source and emission inventory, the representativeness of the meteorological data, and the model algorithms that represent the atmospheric physics and chemistry processes.

It is important that the air quality modelling comply with accepted regulatory requirements and best practices. The Alberta air quality model
The guideline is the standard assessment and modelling protocol that describes both the accepted methods for modelling and the required technical competencies of air quality modelling practitioners.

The skills and technical competencies required to complete proper air quality modelling include education and specialized training in chemical and physical meteorology and air pollution science, experience in estimating and characterizing pollutant emissions from a wide variety of emission sources, and experience with the application of meteorological models and dispersion models.

Those who conduct air modelling should have the skill and knowledge to select the most appropriate model for the task, review, interpret, process and apply meteorological data in the models, understand the difference between good and bad data, understand and consider baseline concentrations, implement quality assurance, quality control practices, and appropriately interpret the model predictions.

MR. IGNASIUK: Thank you. Turning to another topic. Parties like OSEC have claimed that Teck’s assessment of the benefits of the project are incorrect or incomplete because it used an input/output model rather than a cost-benefit analysis. Can you
respond to this?

MR. McFADYEN: Yes. I'll ask Mr. Shewchuk to respond to this.

MR. SHEWCHUK: Mr. Chair, the socioeconomic impact assessment included in the filed materials is consistent with the assessment methodology employed in the evaluation of all previous oil sands applications in Alberta.

The socioeconomic impact assessment is a comprehensive examination of the social and economic impacts of the project on affected local communities and the province overall. It also contains the detail necessary to understand the magnitude of project effects and how these effects will manifest in space and time.

The cost-benefit study submitted by OSEC is extremely sensitive to the underlying assumptions of the author. We are of the view that the study does not adhere to best practices for cost-benefit analysis, and note that a minor adjustment to a single key assumption can completely reverse the outcome of the analysis.

For example, a reduction of approximately 2.5 per cent in the discount rate used for project benefits results in a positive net present value. In brief, findings of the study are not robust
and should not be relied upon by the Panel.

MR. IGNASIAK: It has been suggested that the project’s economic viability has not been completely assessed because Teck has failed to take into account greenhouse gas emission costs.

Additionally, it has further been raised that greenhouse gas emissions from the project will render Alberta and Canada’s emissions goals unreachable.

Can you respond to these two issues?

MR. McFADYEN: Yes. I'll ask Mr. Chiasson to speak to greenhouse gas emission costs specifically, and Mr. Speller to deal with the project’s greenhouse gas emissions generally.

MR. CHIASSON: Mr. Chairman, the Oil Sands Environmental Coalition, OSEC, has stated that Teck has underestimated the cost of compliance with the carbon competitiveness incentive regulation. Teck doesn’t agree with the analysis conducted by OSEC and doesn’t view the assumptions used in their analysis as realistic.

Teck’s design greenhouse gas, or GHG, emissions estimate for the project was calculated on a conservative basis, which is appropriate for the environmental impact assessment for the project.
However, OSEC used this conservative design estimate of the GHG emissions and for its cost of carbon analysis for the project assume that there wouldn’t be any emissions improvements or reductions whatsoever for the 41-year operating life of the project. We don’t think this is a realistic assumption.

Teck is a founding member of Canada’s Oil Sands Innovation Alliance and actively participates in the greenhouse gas environmental priority area. CEAA member companies have spent over $200 million to date to evaluate and develop GHG reduction technologies. As shown in IHS Markit’s September 2018 report, the GHG intensity of mine oil sands decreased by more than 25 per cent from 2009 to 2017, during a period of time when less aggressive carbon regulation existed. We expect this trend to continue.

Importantly, IHS Markit predicts that an additional 15 to 24 per cent intensity reduction is possible for the Paraffinic Froth Treatment mine operations like Frontier by 2030. This estimated reduction is based on conservative assumptions and does not assume that transformational technologies will be developed.

Teck supports the vision that the Governments of Canada and Alberta have for carbon
pricing to increase over time in concert with coordinated global action. We agree that this is needed to make the change to a low-carbon economy.

Mr. Chairman, we note that OSEC assumed that the output-based allocation will continue to become more stringent every year for the next 50 years. However, it is important to recognize that other oil-producing jurisdictions have been slow to implement carbon legislation.

Canada and Alberta recognize that the practical need to maintain the competitiveness of Canada’s trade-exposed sectors to prevent carbon leakage to less progressive jurisdictions.

This is critical for three reasons. First, industry has to be able to afford to invest in the development and deployment of less carbon-intensive technology. Second, if industry is not competitive there will be less carbon tax revenue generated to support research and development of low carbon technology.

Third, to survive, companies may be driven to move production of trade-exposed commodities to less progressive jurisdictions. Therefore, we don’t agree with OSEC’s assumption. We are confident that our estimated cost of carbon is reasonable.
MR. SPELLER: Mr. Chairman, regarding greenhouse gas emissions, the Oil Sands Environmental Coalition, or OSEC, states that our analysis underestimated the greenhouse gas emissions for the project. This is not correct.

OSEC states that upstream greenhouse gas emissions from the production of natural gas and diesel that Frontier would consume should be included in the project emission totals. Mr. Chairman, in July 2016 the Federal Minister of Environment wrote to you stating, and I quote:

“I expect your analysis of the effects of greenhouse gas emissions to focus on the direct emissions attributable to the project. Potential upstream greenhouse gas emissions linked to the project are not clearly identifiable, because there are no industrial activities upstream of the project.” (As Read)

This letter is Document No. 205 on the Project Registry.

Mr. Chairman, we believe our greenhouse gas emission inventory for the project is appropriate for an environmental impact assessment.
MR. IGNASIAK: Mr. Chairman, before we continue, I see it's noon. I think we have 15-20 minutes left, so I'm in your hands as to how the Panel would like to proceed.

THE CHAIRPERSON: If it's 15 or 20 minutes, we might as well do it before lunch. If it’s going to go longer, then we should take a break.

MR. IGNASIAK: Now I’m worried how accurate that was.

THE CHAIRPERSON: Okay. Well, let’s take a break then.

MR. IGNASIAK: All right.

THE CHAIRPERSON: So let’s break for lunch. It’s 12:00, so we’ll resume at 1:00.

MR. IGNASIAK: Thank you.

THE CHAIRPERSON: Okay. Thank you.

--- Upon recessing at 1200 / suspension à 1200
--- Upon resuming at 1300 / reprise at 1300

THE CHAIRPERSON: Thank you. Please be seated. Whenever you're ready, Mr. Ignasiak.

MR. IGNASIAK: Thank you, Mr. Chair. Mr. Chiasson, some of the submissions filed by intervenors raised concerns that the approval, construction, and operation of the project is inconsistent with Alberta’s 100-megatonne oil sands
emissions cap and other provincial and federal
commitments.

Can you respond to this please?

MR. CHIASSON: Mr. Chair, yes I can.

The Pan-Canadian Framework identifies
that each province has a role to play in reducing
Canada’s carbon emissions. That Alberta’s key actions
to date for managing carbon include: phasing out
thermal coal; placing a levy on carbon emissions; and, a
limit on oil sands greenhouse gas emissions.

An overarching goal of the oil sands
advisory groups advice to the Government of Alberta
Ministers includes: maximizing the development
potential of Alberta’s oil sands resource within the
100-megatonne cap. The regulations for the Oil Sands
Emissions Act Limit, or the Oil Sands Emissions Limit
Act, has not been completed.

So there’s uncertainty about how the
Alberta Government will define the project inclusion
list that defines the approach to the limit and the
intensities that will be used to determine cumulative
emissions.

However, it is clear that the forecast
rate of oil sands development has decreased since the
emission limit regulations were developed and that the
approach to the limit has slowed. The changes reflected in IHS Markit’s 2017 update that indicates, “the 100-megatonne cap emission limit for Canadian oil sands is not likely to be exceeded.”

The outcome is predicted without consideration of the deployment of new technology incented in response to the regulation. Teck believes that abundant room exists within the established limit for Frontier and that the project is a preferred development because it has low greenhouse gas intensity in relation to other methods of oil sands production.

It is for these reasons that Teck feels the project is consistent with Canada’s and Alberta’s climate change goals.

MR. IGNASIAK: Thank you. The submissions of the Keepers of the Athabasca include a paper from Regan Boychuk entitled “Alberta Over a Barrel, Environmental Liabilities and Royalties in the Oil Sands.” This report calls into question Teck’s environmental liability accounting practices and states that, and again I quote, “Teck Management has used its discretion to manipulate accounting estimates to suit the financial needs of the moment,” and insinuates that the company has acted inappropriately.

I understand Teck would like to respond
Firstly, Teck does not manipulate accounting estimates and has not acted in an inappropriate way. As a Canadian public company we are required to follow international financial reporting standards for financial reporting purposes. As with all public companies, our financial statements are audited by independent auditors, our case PricewaterhouseCoopers, PwC.

Any estimates or judgment made by Teck as part of its financial statements is audited and it is confirmed that these are reasonable and applied on a consistent basis. Any new estimates or judgment or change in methodology are assessed and scrutinized by Teck Management, Teck’s Audit Committee and PwC. This applies to reporting and disclosure around reclamation liabilities, including discount rates and other inputs.

With respect to the Project, Mr. Boychuk asserts, and I quote, “Any change in projected operations over the coming decades leaves the company at real risk of bankruptcy and the public at real risk of ultimately enduring a net loss on a project.” Chair, this statement is speculative and it misrepresents the facts.
If the Project were to be approved and a decision to proceed with the Project made by Teck’s Board of Directors, Teck will construct, operate, reclaim, and close the project in a responsible manner. Teck will not walk away from its reclamation and close their responsibilities for the Project.

In our 100-year history we have always had sufficient liquidity through our cash balances and lines of credit to honour our liabilities as they become due. That will continue to be the case.

MR. IGNASIAK: Thank you. Some of Teck’s Indigenous partners are here speaking to outstanding issues they have with respect to the provincial and federal crowns, and have specific requests for further crown action. What is Teck’s position on these communities’ requests?

DR. JOHNSTONE: Dr. Robin Johnstone. Teck is fully supportive of governments working with Indigenous communities, including Fort Mackay First Nation, Athabasca-Chipewyan First Nation, and Mikisew Cree First Nation on their respective recommendations which they’ve included in their written submissions, and which we understand they will be speaking to in greater detail during this hearing.

Teck agrees with the issues raised by
the communities, which all pertain to government action rather than actions by Teck, warrant serious consideration by governments during the phase of consultation that will take place following this panel process.

Teck is supportive of governments working with Indigenous Communities on resolution of those issues and Teck is committed to be a valued regional contributor to implementation of these resolutions.

We hope that this provides further clarification to the opening statement on the concerns raised by communities.

MR. McFADYEN: Thank you, Dr. Johnstone.

Dr. Johnstone, the Joint Review Panel has received submissions from Katl’odeeche First Nation, Deninu Kue First Nation, the Northwest Territory Métis Nation, and Smith’s Landing First Nation. These communities are concerned about the Frontier Project’s potential effects on the outstanding universal value, or OUV, of Wood Buffalo National Park and the Peace-Athabasca Delta, or PAD.

They’re concerned that if the Project has effects on the park or the PAD that they in turn
will be affected. These groups have also indicated they were not consulted regarding the Project.

Can you please, for the benefit of the JRP, advise the Panel of the consultation undertaken by Teck with these four communities?

MR. JOHNSTONE: Yes. With respect to the particular Indigenous groups just referred to: Deninu Kue First Nation; Katl’odeeche First Nation; Smith’s Landing First Nation; and, the Northwest Territory Métis Nation, we also began engaging with these communities approximately 10 years ago, in 2008 or 2009.

As you can see in Attachments 21 and 23 through 26 of our September 12, 2018 reply submission, marked as Exhibit 504, Teck provided each off these communities with letters and substantive packages providing information regarding the proposed Project, including proposed terms of reference.

Teck sent out additional information packages, letters and, in some cases, emails to these communities in 2010 and 2014, aligning with work on the Project update.

Mr. Chairman, with the exception of Deninu Kue First Nation and NWT Métis Nation, Teck never received any correspondence, questions or queries from
any of these communities until after the terms of reference for the Frontier Joint Review Panel were amended to include consideration of the effects of the Project on the outstanding universal values of Wood Buffalo National Park, including the Peace-Athabasca Delta. This amendment to the terms of reference was issued relatively recently, on August 16, 2017.

Regarding Deninu Kue First Nation, the Nation did not request a meeting with -- sorry, the Nation did request a meeting with Teck in 2009. However, Teck did not feel that the budget submitted by the Nation was appropriate for the scope of an introductory meeting.

Deninu Kue First Nation had at that point committed to providing an amended budget. However, that did not happen and Teck did not hear back from Deninu Kue First Nation regarding a potential meeting.

Regarding the Northwest Territories Métis Nation, conversations were held regarding business opportunities in 2014, but these did not advance at that time. Following the NWT Métis Nation’s most recent correspondence, we were pleased to hold a meeting to discuss their concerns and interest with the Project in August, and to convey Teck’s perspective on a reasonable
scope for ongoing information sharing and engagement between the parties.

While we acknowledge each of the four communities has expressed concern regarding the scope of the consultation work carried out between themselves and Teck, we respectfully submit that the level of consultation has been appropriate given their connection to the project and surrounding area, and entirely consistent with Teck's indigenous peoples policy.

Mr. Chairman, to explain Teck's perspective on an appropriate scope of consultation with each of these communities, I wish to point out that none of the communities have provided us with evidence that the project is located within the traditional territories. As a matter of fact, none of the submissions filed by these four communities claim that the project is located within their traditional territories.

Mr. Chairman, we feel that it's important to point out that in addition to not identifying the Frontier project as falling within their traditional territories, the primarily -- the primary locations of each community are a significant distance from the project.

Deninu Kue First Nation is primarily
located in Fort Resolution, which is located 385 kilometres from the Frontier project.

Katl’odeeche First Nation is primarily located at the Hay River Dene Reserve, which is located approximately 405 kilometres from the Frontier project.

Smith's Landing First Nation and the NWT Métis Nation are both based in Fort Smith, which is located approximately 240 kilometres from the Frontier project.

However, Mr. Chairman, all of these four -- all four of these communities expressed concern regarding Wood Buffalo National Park and the Peace-Athabasca Delta. Teck does not dispute these areas are important to these communities. However, as Mr. Speller has already explained, the Frontier project is predicted to have a negligible effect on the park, including the PAD.

These communities' traditional use of the park and the PAD will not be affected by the Frontier project.

Mr. Chairman, it is significant that all four of these communities were provided with notice of the project approximately 10 years ago, and none have raised any substantive concerns with Teck regarding the project until recently after they were notified by the
Government of Canada that a strategic environmental assessment of the park was being carried out. Our understanding is that Canada has consulted with these four communities with respect to the initiatives being undertaken in connection with Wood Buffalo National Park and the PAD by government. Therefore, Teck is not prepared to enter into impact benefit agreement or participation agreements with these four communities because they are not affected by the project. However, Teck is prepared to share with these communities information regarding the project, including potential employment and contracting opportunities.

This commitment is confirmed by our recent activities. In late August of this year, Teck met with the NWT Métis Nation in Vancouver. In addition, earlier this year, on May 1st, Teck met with the Chief and Council, CEO and Lands Department of Smith's Landing First Nation to discuss the project.

In conclusion, Mr. Chairman, while Teck is prepared to continue providing information to each of these indigenous communities, including ways -- looking at ways we can facilitate employment and contracting opportunities for these communities, we believe this
level of ongoing consultation and engagement is appropriate given the communities are located a significant distance from the project and are not affected by the project.

MR. IGNASIAK: Mr. McFadyen, the Government of Canada has submitted a Whole of Government of Canada Preliminary Assessment of Potential Impacts on Aboriginal or Treaty Rights. This preliminary assessment sets out certain mitigation measures the Government of Canada is considering.

This submission, Exhibit 489 at PDF 622 and 623, states that Canada is considering a project-specific Teck Frontier Monitoring and Oversight Committee.

The submission states that this committee should include governments, MCFN and potentially other indigenous groups to achieve (1) indigenous involvement monitoring related to the project, (2) adaptive management, and (3) input into regional based monitoring through the existing Oil Sands Monitoring initiative.

Can you please provide the Panel with Teck's view on this proposed mitigation measure?

MR. MCFADYEN: Mr. Chairman, the Government of Canada's submission provide -- provides
few details regarding this structure of this Oversight Committee. Teck is not aware, at this time, of the status of discussions between Canada, Alberta and indigenous groups regarding this proposed measure.

However, we do want to be helpful to this Panel and provide some meaningful feedback on this proposal.

Assuming that Canada is proposing a vehicle by which indigenous groups can become more involved in monitoring, we are generally supportive of this concept. As a matter of fact, many of the commitments that we have made to indigenous groups in our participation agreements can likely be facilitated through such a proposed committee.

However, Mr. Chair, as everyone in this room knows, this is a highly competitive business. So while Teck is supportive of robust and transparent oversight, it is important to make sure that duplication and inefficiency is avoided.

We ask that Teck be provided with the opportunity to work with Canada, Alberta, MCFN and other indigenous communities to make sure that a project-specific committee is established and is, indeed, efficient and effective.

So we're committed to working with
stakeholders to accomplish this, and we look forward to receiving more information regarding this initiative.

MR. IGNASIAK: Thank you.

Finally, Mr. McFadyen, several groups, including OSEC, have stated that the Frontier project is simply not in the public interest. Can you respond to this?

MR. McFADYEN: Mr. Chairman we do not agree with this and we are of the view that the project is very much in the public interest.

Some of the intervenors are of the view that oil sands development should cease and that Canada should leave oil in the ground. Frankly, this ignores the fact that Canada and the rest of -- and the rest of the world will continue to demand oil, as I mentioned before.

I would submit it's not in the public interest for Canada to acquire its oil from foreign sources instead of developing reserves. In addition, it's not in the public interest for Canada to stop developing and exploring -- and exporting oil and to simply allow other jurisdictions to supply global demand.

MR. IGNASIAK: Thank you, Mr. McFadyen.

Mr. Chair, if I could just have a
moment and determine if there's anything further.

THE CHAIRPERSON: Yes, you may.

Thanks.

MR. IGNASIAK: All right, Mr. Chairman. I think that concludes our direct evidence and the Panel is now available for cross-examination and questioning.

Thank you.

THE CHAIRPERSON: Thank you, Mr. Ignasiak.

So according to the schedule and the order of registration, the first party with the opportunity to cross would be Canadian Parks and Wilderness Society.

MR. HO: The Canadian Parks and Wilderness Society is not prepared to cross-examine at this time. To ensure that this doesn't cause a delay, we've ensured that the Oil Sands Environmental Coalition is able to cross-examine now if no one else wants the spot.

We will be prepared to cross-examine by tomorrow.

THE CHAIRPERSON: Okay. Well, let's start with Oil Sands Environmental Coalition.

MR. ROBINSON: Mr. Chair, Barry Robinson representing Oil Sands Environmental Coalition.
We are prepared to start now, and we might be a couple minutes to set up to do that, although I would make the offer if there's -- with your approval, of course, if there's somebody who needs to cross and get out today, that we would stand down and let them do it.

We're in your hands on that.

THE CHAIRPERSON: Okay. Well, as explained earlier, we're planning to go in the order of registration, so I don't want to deviate too much from that.

If there clearly is somebody who is pressed for time and would really like to cross this afternoon, we can entertain that. But otherwise, Mr. Robinson, I'll suggest you probably go.

MR. ROBINSON: Seeing no one rushing forward, if we could have a couple minutes to bring our materials up.

MR. IGNASIAK: Mr. Chairman, during that time, because OSEC was kind enough to provide us with about 1,200 pages of aids to cross, we have an idea of where they're going.

So if we could just move some of our panel members around so we think we can be more responsive --
THE CHAIRPERSON: Okay.

MR. IGNASIAK: -- that would be appreciated while they set up.

THE CHAIRPERSON: Yeah. Why don't we take 15 minutes so everybody can get organized.

--- Upon recessing at 1323 / Suspension à 1323

--- Upon resuming at 1334 / Reprise à 1334

THE CHAIRPERSON: Thank you. Please be seated.

Sorry. That was a quick 15 minutes. Just a reminder for the benefit of the court reporter, when we have different people coming up to the microphone, again remember to kind of say who you are so the court reporter can be clear on who's speaking.

Thank you.

Mr. Stilwell.

CROSS-EXAMINATION

MR. STILWELL: Thank you, Mr. Chairman. And good afternoon, Chairman, Members, staff, counsel and Teck representatives.

There's Mr. McFadyen.

And when I was sitting back there, I couldn't see Mr. Shewchuk and Mr. Pearce.

MR. SHEWCHUK: It's Pearce Shewchuk.
MR. STILWELL: Okay. Oh, Mr. Gray and Mr. Shewchuk.

Thank you. Okay.

And most of my questions will be aimed at the two of you. However, I think some of them may call for a response by Teck personnel, and I invite you to interject at any time, Mr. McFadyen, if you think there's a witness better equipped to answer the question or add to the answer.

MR. McFADYEN: Thank you. I appreciate that.

MR. STILWELL: Okay. Now, in your September 12 submission, appended to it, were Attachment 1 and Attachment 2, which were documents prepared by Nichols Applied Management.

And Mr. Shewchuk and Mr. Gray, did one of you prepare number 1 and then the other prepare number 2, or did you work together on both of those?

MR. SPELLER: Mr. Chairman, for clarity, Attachment 1 was prepared by Teck and Attachment 2 was prepared by Nicholas, with Mr. Shewchuk as the primary author.

MR. STILWELL: Okay. All right.

I'd like to start with making sure I understand the reasons why the differential in price
between Western Canada Select -- between Western Canada Select and West Texas Intermediate exists. Why is there a price differential?

MR. CHIASSON: Could you please repeat the question?

MR. STILWELL: Sure.

Why is there a price differential between Western Canada Select and West Texas Intermediate?

MR. CHIASSON: So Mr. Chairman, there's a couple of reasons for the differential.

The Western Canada Select product is -- it's a heavier product in general compared to West Texas Intermediate, so the lighter product carries with it a higher value in the market. That's one reason.

There's a number of other reasons that have an impact on differentials between those commodities.

One of the other reasons today is the -- the primary market for WCS product from Canada is the United States, currently. It's primarily the market. And there is a deficiency in pipelines currently, which is reflecting higher differentials than historic today.

MR. STILWELL: And we've seen -- you
will have seen references in articles about, first of all, Shell walking away from its Carmen Creek project in the Peace River oil sands and taking a $2 billion restructuring charge and offering, as a result, the lack of take-away capacity. Did you see that?

MR. CHIASSON: Mr. Chairman, I am aware of Shell's decision to -- I don't know if walk away is the right way to say it, but to the article that counsel has referred to.

MR. STILWELL: Okay. And you saw that they offered the lack of take-away capacity as a reason.

MR. CHIASSON: Mr. Chairman, I'm not aware of that part of their decision, but I am aware of the article.

MR. STILWELL: Okay.

MR. CHIASSON: -- of the fact that they have walked away from that project.

MR. STILWELL: And more recently, Suncor said it was shelving expansion plans until a pipeline is under construction to get to different markets.

MR. CHIASSON: Are you asking me am I aware?

MR. STILWELL: Yes.

MR. CHIASSON: I'm aware that Suncor
made that statement, Mr. Chairman.

MR. STILWELL: Okay. And you often see statements like -- and I'll get to the statement in a moment. And it's a statement that Teck has made in its materials as well. That if it were possible to ship our bitumen to international markets, particularly Asia, a world price would be obtained.

That, of course, would be the world price for bitumen, wouldn't it?

MR. CHIASSON: Could you please repeat that?

MR. STILWELL: Well, it's stated by many, including Teck in its materials, that if it were possible to ship our bitumen to foreign markets like Asia, Canada could obtain -- or Alberta could obtain a world price for its bitumen.

MR. CHIASSON: I would generally agree with that statement. If Canada could get its bitumen to Tidewater or other markets, it would receive a much higher price for its product.

MR. STILWELL: And why do people think it would be a much higher price?

MR. CHIASSON: Mr. Chairman, I can't speak for people, but I can speak for Teck.

Our view is the market right now is
constrained within northwestern United States. It's land-lock. And because of lack of competition for product from western Canadian, I wouldn't say we're held hostage, but it's a one market area for product from western Canada.

So refineries in the United States who take product from western Canada are able to discount significantly the price that they're willing to pay for the bitumen from Canada because there's not a lot of options available currently for producers from western Canada to market their product elsewhere.

MR. STILWELL: But because it is a lower grade of petroleum, it is not likely to approach prices received for the lighter, superior grades like WTI or Brent, is it?

MR. CHIASSON: Mr. Chairman, I don't know if I would agree with that statement exactly or characterize it that way.

The reason for the wide differentials today is mainly driven by access, not driven by difference in quality. I believe counsel said "would not approach the prices of WTI and WCS". That differential, in Teck's view, would narrow significantly should we have more access opportunities for our product.
MR. STILWELL: Now, in its materials

Teck states that it is confident pipelines will be built
to give us that greater access.

MR. CHIASSON: That's correct, Mr. Chairman.

MR. STILWELL: And which pipelines is it confident will be built?

--- Pause

MR. CHIASSON: So Mr. Chairman, I have a longer-term answer and a shorter-term answer.

So the longer-term answer is,
historically, energy -- oil and gas companies have supported pipeline companies if there's additional capacity that's required to get product to market.

Pipeline companies have done that with the support of oil and gas companies.

That's what's happened over history.

We believe that that principle still applies going forward, so that's the longer-term answer.

In the shorter-term answer, we see three pipeline options in front of us, or currently that have been approved or are in the approval process.

Those lines -- and this is also published in the Canadian Association of Petroleum Producers 2018 report, that Enbridge Line 3 replacement would be one of the
Trans Mountain Expansion Pipeline, which has been in the news a little bit recently, would be another.

And TransCanada's Keystone XL Pipeline through the States would be the third.

So those projects have been approved or are in their approval process, but if I could elaborate a little bit on each of those, that would complete my response to that.

So starting with the Keystone XL, it's received all federal and state approvals for the construction in the United States. There was a delay because of judicial challenge in the State of Nebraska, and there was a re-route option that was required. But filing ruling on this challenge is expected early in the first quarter of 2019.

And ultimately, we're confident that that approval will come, the line will be built, and it'll be in place because it's in the best interests of Canada and there's a market for it.

Next I'd comment a little further on the Trans Mountain Expansion Pipeline. People may have seen in the news that the Canadian government actually bought that pipeline.
Teck does acknowledge that Canada's Federal Court of Appeal overturned Ottawa's approval of the Trans Mountain Pipeline, and that happened in August. And that was reported in a number of papers, and Canadian Press was one.

However, the federal government, since that -- since that ruling was overturned, the federal government has been very vocal and has vowed to build and see that -- to build that pipeline and see it through.

So for Teck, that commitment by Canada, that -- the advocating for it from the Government of Alberta, there's more regulatory requirements for that -- for that pipeline, but ultimately, we think it's going to get built. We feel it's going to get built.

The Canadian government has stated that they want to get it built. We think that that will be built.

And then the other line was Enbridge Line 3. So, construction is commenced on that line throughout the proposed right-of-way within Canada and the United States with the exception of the State of Minnesota. And, there was a re-routing or an issue in the State of Minnesota that, however, Enbridge has received approvals for project construction in Minnesota.
late June and we expect that that construction is going to proceed.

So, those are the three lines. And, you know – or, those are the three lines in the short term. The first part of my remarks was about principles in the long-term. And, as we have stated in our filed materials, first oil for Frontier it is expected, should the Project be approved, in 2026. So, there is time in between now and then for construction of three pipelines in the short term.

MR. McFADYEN: Chair, if I could add. Chair, if I could add. So, indeed the current price just is a reality. I don’t know what it is today, but it is about $30 today. And Teck doesn’t believe that’s sustainable. I don’t believe that’s sustainable. I don’t know any jurisdiction on this planet that can live with that level of discount, frankly. So, I think it is pretty clear that the country needs access to markets.

Now, as an operator, the most efficient and safest way to get product to market is via pipelines, so we strongly support the federal government’s initiative to expand these pipelines.

The other thing I would add here is we are not wedded -- we are not wedded to any individual pipeline. In fact, we’re a commercial entity, we like
choice; and, choice is important to us but it is also important to the end user.

MR. STILWELL: Mr. McFadyen, you were mentioning the high differential these days and for the last number of days, and you said $30.

MR. McFADYEN: So, forgive me, I haven't check today, so it may have moved today, I don’t know, I just haven’t checked today.

MR. STILWELL: Oh, I just wondered if you were -- if that was US dollars because on Friday it was 44.11.

MR. McFADYEN: Yeah.

MR. STILWELL: And it has hit 46, but the last number of days it has been between 40 and 45.

MR. McFADYEN: So I'll be open with you, Chair, I’ve been busy and I haven’t been looking at it. I really haven’t, so thanks.

MR. STILWELL: And so it is basically 50 percent - it is 50 percent of the price of a barrel of WTI when you convert WTI to Canadian dollars; do you accept that?

MR. CHIASSON: Currently today it could be 50 percent, I haven’t checked as Mr. McFadyen noted. I haven't checked it today; it could be in the range of 50 percent today.
MR. STILWELL: And one of the documents we've submitted to CCEA and the Panel and to Mr. Ignasiak is a tabulation of historical WCS/WTI discounts prepared by Baytex Energy that I obtained. I am sure there are other ones, but I just happened across the Baytex Energy one.

Have you gentlemen had the opportunity to look at that document? And it covers from 2005 to 2018?

MR. CHIASSON: Mr. Chairman, we have had the opportunity to review that document.

MR. STILWELL: All right. And do you have any issues about its accuracy?

MR. CHIASSON: Mr. Chairman, we do not.

MR. STILWELL: All right. Now, what I’m going to use from the columns they prepared is they’ve got a column “The Percentage of WTI”. I’m going to use that as opposed to dollar figures because I don’t want to stand here converting American dollars to Canadian dollars, all right. And, between 2005 and June of 2018 the highest percentage was 36.3 percent and we’re at 50 percent as of Friday. Why is it so high today and these last few days?

MR. CHIASSON: Mr. Chairman, there’s sometimes short-term things that happen such as there’s
a number of refineries that are taking outages in the northwest so there’s pipeline apportionment that’s higher, and apportionment means there’s not enough take away capacity for producers at this time. So, the reason in the recent week for the spike in percentage of differential or high percentage of differential relative to price is due to a number of those short-term factors such as refinery outages, so the customers -- all of a sudden there’s a smaller group of customers looking for oil in these past few weeks, and that is a factor that can contribute to -- and that is a factor that is contributing to the short-term increase in WTI to WCS differentials.

MR. STILWELL: Mr. McFadyen, before I forget, in your introduction this morning you referred to some statistics when you were talking about population growth 9 billion humans on the planet in 2040; do you recall that?

MR. McFADYEN: I do, Chair.

MR. STILWELL: And the prospect of 250 -- you had a number for the number of people that would be lifted out of poverty?

MR. McFADYEN: Yes. So, Chair, that was 2.5 billion.

MR. STILWELL: Okay.
MR. McFADYEN: I think I went on to say
that’s equivalent to roughly two current day China’s,
2.5 billion.

MR. STILWELL: And I didn’t catch it
all but you spoke about, I take it, royalties being able
in the future to fund more hospital visits; did I get
that right?

MR. McFADYEN: Yes. I used, I think,
“for example”. I was trying to put $70 billion into
context; nothing more than that.

MR. STILWELL: Okay. Do you have your
sources for those at this time?

MR. McFADYEN: Yes, in detail, which I
am happy to submit these references which provide the
source.

MR. IGNASIAK: Mr. Chair, why don’t we
undertake to provide that, and we’ll make the necessary
copies and get an electronic copy and submit it sometime
today?

THE CHAIRPERSON: Okay, thank you, Mr.
Ignasiak.

MR. STILWELL: Gentlemen, what is meant
by the marginal barrel of oil?

MR. CHIASSON: Can you provide a
reference for that?
MR. STILWELL: Well, what I'm thinking is I believe I’ve seen reference to bitumen being the marginal barrel of oil, meaning, as I understand it, and I’m hoping you can help me understand it better, because of the cost to produce it if worldwide demand for oil drops it will be the marginal barrel that ceases to produce or has its production slowed because the value of oil goes down, so it will be the less costly blends or types of oil that continue, but the marginal one is at risk -- at the most risk, because it is the most expensive. Is that -- have I got that correct?

MR. CHIASSON: Mr. Chairman, I wouldn’t concur with counsel’s statement. Do you have a specific reference that you can point me to where you’ve seen this?

MR. STILWELL: I don't. Okay, I just thought it was common parlance in particular in Calgary to hear people refer to oil sands oil as the marginal barrel, so okay.

Now shipping crude by rail, in your materials you mention that even if there’s a continued constraint on pipeline capacity shipping the product from the Frontier Project by rail is a possibility?

MR. CHIASSON: Is that a question?

MR. STILWELL: Yes.
MR. CHIASSON: Okay. Mr. Chairman, yes, shipping bitumen by rail is a possibility. In fact, you know there’s volume being transported today by rail.

MR. STILWELL: And can you give me a rough picture of the cost of shipping by rail compared to cost by shipping by pipeline? Might it be in the range of $7 a barrel by pipe and upwards of $15 or $16 per barrel by rail?

MR. CHIASSON: Mr. Chair, just one moment to confer with colleagues.

--- Pause

MR. CHIASSON: So, Mr. Chairman, to get very specific, I believe that would be commercially sensitive. That said, I would acknowledge and agree that currently today shipping oil by rail is generally more expensive than by pipe.

MR. STILWELL: And I understand that railways, if not seeking long-term shipping contracts now, they do want to into the future; do you understand that to be the case?

MR. CHIASSON: I'm not sure I understand your question. Could you rephrase, please?

MR. STILWELL: Well, as opposed to intermittently using the services of a railway company
to ship your bitumen, they want long-term contracts, perhaps even take-or-pay, in order to increase the number of rail cars and devote more resources to the shipping of crude. Have you heard of that?

MR. McFADYEN: Again, Chair, if I may. So we started this conversation talking about price differentials. I made the comment -- I want to come back to that comment that Canada needs access to markets. I also made the comment that the best way to ship crude, so the safest, most efficient, most responsible way, and cost effectively to ship crude is via pipelines. Now, rail has got a role to play in Canada, but I don’t currently view rail as the baseload way of exporting or transporting oil, frankly. I do think it’s got a role in the load distribution curve. For example, in the event of pipeline constraints or in the event of operational constraints upstream, then operators may decide to enter into limited contracts, I would imagine, although I don’t know, in order to keep the product flowing, but I wouldn’t want this Panel to think that rail is the baseload solution for oil sands production.

MR. STILWELL: I guess here is another way of approaching it. Are you aware of the recent news that railways want shippers to commit to long-term
shipping contracts?

   MR. CHIASSON: Mr. Chair, yes, we're aware of that.

   MR. STILWELL: And can you tell me what the reaction to that is by oil sands industry participants? Are they in favour of it, are they resisting it?

   MR. CHIASSON: Mr. Chair, just one moment.

   --- Pause

   MR. CHIASSON: So, Mr. Chairman, it wouldn’t be appropriate for me to comment on what other companies are thinking with respect to bitumen by rail, but I can speak for Teck. As Mr. McFadyen pointed out, we do see this as -- that the rail does have a role to play. We see pipelines as the predominant transportation method for our product, but we do see rail having a role to play. So for Teck, we do discuss transportation by rail with rail companies and we are having those discussions.

   MR. STILWELL: Does Teck follow and/or study growing commentary along the lines of "With the increased adoption and use of alternative renewable energy sources and electric vehicles there arises the possibility that the oil sands industry is a sunset
industry and may cease activities a lot sooner than at the time of end of life as predicted by oil sands companies"? Do you keep abreast of those arguments? So, for example, the Governor of the Bank of England, Mark Carney, saying, "Those assets will be stranded assets and a lot quicker than people think", is that something that at Teck you follow, study, talk about?  

MR. McFADYEN: It sure is.  
MR. CHIASSON: Mr. Chairman, if I could add to Mr. McFadyen's comment.  

There are a number of opinions about what future oil price might be or what future demand may be for oil. Teck uses third-party oil price forecasters that do this for a living. With all due respect to Mr. Carney, Teck uses the IEA, the International Energy Association. We look at a number of forecasts, including the U.S. Energy Information Administration, and we look at what the leading companies that forecast oil, and that's their business, what they say about the demand and what they say about price. So when we did our socioeconomic analysis we looked at a number of those and we included the International Energy Administration's base case forecast for the time period, if the project was approved, that the project would be operating, from 2026 to 2066. We used those forecasts.
to assess what the potential demand for the product was. 

So using what we have submitted and 

getting back to counsel's question about electric 
vehicles, those forecasts consider that. Those 

forecasts take into account that renewables will grow 
over time. But that said, those forecasts also include 
from a demand perspective that there will be a strong 
market for oil well into the future. The demand 
fundamentals are strong even with renewables coming and 
that's what gives Teck -- and Mr. McFadyen spoke to some 
of the reasons earlier, that the International Energy 
Agency has come to that assessment as well as the U.S. 
EIA, is that while renewables are going to be on the 
increase, there's still by far a strong demand for oil 
into the foreseeable future. So there are a number of 
different opinions, but Teck feels confident in the 
forecast from those companies that do this for a living 
and we think that using that as the basis for the 
Frontier socioeconomic analysis and application is 
reasonable.

MR. STILWELL: Last week I sent over to 
Mr. Ignasiak, and it is now part of the record -- it's 
not up on the Registry yet but I understand it to have 
been given document number 557 -- and contained within 
that is what appears to be an abstract of the -- it's
either an abstract of a study or it's a very, very short study entitled "Macroeconomic Impact of Stranded Fossil Fuel Assets" based on a study and modelling done by academics at a university in the Netherlands and at Cambridge in the United Kingdom. Did anyone review that item?

MR. CHIASSON: Mr. Chairman, I reviewed the item.

MR. STILWELL: All right. And I'm just going to make very, very quick references to it and in particular the opening paragraph, which seems to be a summary of what the balance of the study says. It says:

"We use an integrated global economy environment simulation model to study the macroeconomic impact of stranded fossil fuel assets. Our analysis suggests that part of the SFFA (stranded fossil fuel assets) would occur as a result of an already ongoing technological trajectory. Irrespective of whether or not new climate policies are adopted, the loss would be amplified if new climate policies to reach the 2
percent target of the Paris Agreement are adopted and/or if low-cost producers, some OPEC countries, maintain their level of production and sell out despite declining demand. Winners, for example net importers such as China or the EU, and losers, for example Russia, the United States or Canada, which could see their fossil fuel industries nearly shut down..." (As read)

And so he’s saying just what is occurring organically with respect to different forms of energy and ignoring government policy, GHG policy, to try and meet international commitments like the Paris Accord could cause very, very significant difficulties to your industry. Do you accept some or all of what is said in this paper, do you reject it, do you have critiques of it?

MR. CHIASSON: Mr. Chairman, I understand that that's what the article states. That conflicts with what -- so this is a study and there was a model, but I would note that organizations like the International Energy Administration have been doing this
for forecasting oil prices for decades. They have over 500 analysts. They have taken into account the emergence of renewable sources of energy and their forecast shows demand increasing from 95 million barrels a day today for oil to 110 million barrels a day by 2040, and the price that goes along with that is $95 or more for the vast majority of the operating period of the Frontier Project should it be approved. And that is concurred -- that forecast and demand projection is also reflected in the U.S. EIA analysis as well. 

So, did I read the report and was that the hypothesis that was made? That's what I understand. Does Teck subscribe to that or oil price forecast organizations such as IEA, is that their base case profile or forecast? My answer to that would be no.

MR. STILWELL: Mr. Shewchuk, I just have one question about your curriculum vitae and it's down on the bottom where you're describing some of the previous work you did and it's in relation to the cost-benefit analysis of the Mackenzie Valley Highway in the Northwest Territories. What was your role on that cost-benefit analysis?

MR. SHEWCHUK: I was part of a team at our firm that completed the analysis. I participated in a portion of the analysis and report-writing.
MR. STILWELL: Okay. The reason I ask is I looked at that document or at least I thought I found that document and it didn’t attribute any -- or credit any authorship or authors, not just you but nobody. So I was just curious if you played a role in writing up the analysis, and you did, did you?

MR. SHEWCHUK: As I recall, that document went through several iterations and I played a role in writing some of them.

MR. STILWELL: Okay.

--- Pause

MR. STILWELL: Now, I am looking at page 5-6 of the responses of Teck to Information Request Package No. 5 on socioeconomics of May 2017, Document 294 on the Registry. And, Mr. McFadyen, I'll let you direct my questions to the appropriate -- I suppose I should stay by the microphone -- person.

Halfway down in the first full paragraph there's a sentence that begins, "As a result of completing", and I'll read it:

"As a result of completing some additional drilling in 2014 and updating the project geology model in 2015, the independent resource assessor has increased its unrisked
resource estimate for the project to be 3,184 million barrels of recovered bitumen."

First of all, what does "unrisked" mean? What should I take from the use of the word "unrisked"?

MR. McFADYEN: Mr. Chair, Mr. Chiasson will take this one.

MR. CHIASSON: Mr. Chairman, for contingent resources such as those for the Frontier Project, it speaks to the stage of development for a project. So this is a bit of an involved answer, but independent resource assessors, when they evaluate a project like Frontier that does not yet have project approval, the determination of the category of the resources is a contingent resource versus, say, a reserve. For an approved project that's built and operating, the estimated bitumen in the ground, because it's an advanced project and it's in operation and a number of the contingencies -- and contingencies include project approval, project sanction, those type of things -- the independent resource assessor for an operating project will refer to those of the estimated bitumen as reserves, whereas for a project that still has contingencies such as the Frontier Project it's
contingent resources.

With the contingent resources the methodology is to have an amount of barrels difference between what's determined to be unrisked barrels and risked barrels. It's a methodology that's used by independent resourcers to reflect the fact that these projects are not as advanced. So it's more of a -- it's intended for investors. It's financial governance, you know, a message for potential investors that this project still has some contingencies associated with it. So there's unrisked and there's risked barrels and there's usually a delta between the two that the independent resource assessor places on those barrels. This is common practice for any project.

So, by stating the unrisked barrels of approximately 3.2 billion barrels, what the independent resource assessor is essentially stating is that their model agrees with Teck's Frontier model that there's 3.2 billion barrels of resource there. What unrisked means is oh, but the project hasn't been approved yet, the project hasn't been sanctioned yet, the project is in middle stages of development, not late. So by National Instrument 51-101, in the way that independent resource assessors speak to it, they remove some -- they have a delta, they have an unrisked number, and then they
subtract some barrels and call that a risked number, and that's to account for the fact that there's still some contingencies associated with the project.

MR. STILWELL: Okay. But the approximate 3.2 billion barrels is the bitumen that you hope to recover?

MR. CHIASSON: 3.2?

MR. STILWELL: Yes.

MR. CHIASSON: Yes, 3.22 billion barrels is our estimate of the bitumen resource at Frontier.

MR. STILWELL: And in the next paragraph, you state:

"As indicated by the updated socio-economic results provided in Tables 5.1a-1 to 5.1a-3, the Project will be economically robust, financially viable and a strong contributor to the Albertan and Canadian economies under all scenarios."

And that suggests to me that you have high confidence in the financial and economic viability of the project. Is that accurate?

MR. CHIASSON: Mr. Chairman, I don't
know if I'd use those exact words. I believe the words that we've used in the paragraph reflect Teck's feeling that this is an economically robust project. It's "financially viable and a strong contributor to Albertan and Canadian economies under all scenarios."

So I'm not exactly sure I agree with the way it was characterized by -- that's Teck's view, apparently.

MR. STILWELL: Sure. Sure.

We also provided to your counsel the February 14, 2018, Management's Discussion and Analysis. And I'm going to refer you to a portion of that in a moment.

But before I do, a document like this Management's Discussion and Analysis, is it written in-house at Teck, or is it sent out for writing by a consultant or people who prepare these sorts of things?

MR. CHIASSON: One moment, Mr. Chair.

Mr. Chairman, that document is developed by Teck. Whether some aspects of some information there's consultant help, you know, to bring that together -- in a small way, maybe. But that's a Teck management-developed document.
MR. STILWELL: Okay. And I want to go over to page 23 of that document. And you'll see the heading "Frontier Project."

MR. CHIASSON: I do, Mr. Chair.

MR. STILWELL: And will you look at the second paragraph under that heading.

MR. CHIASSON: I'm there. I have that.

MR. STILWELL: And I'll read it. It's short.

"As of December 31, 2017, our best estimate of unrisked contingent bitumen resources for the Frontier project is approximately 3.2 billion barrels. The project has been designed for a total nominal production of approximately 260,000 barrels per day of bitumen. The Frontier contingent resources have been subcategorized as "development pending" and "economically viable."

There is uncertainty that it will be commercially viable to produce any portion of the resources."

That strikes me as being a bit different from the previous statement that it's robust
and economically viable. Here, management is talking about uncertainty exists that commercial viability will in fact be in place for production of those resources. What facts was management thinking when it made that statement? Why was there uncertainty? To what can you attribute that uncertainty?

MR. CHIASSON: I can answer this question, Mr. Chairman.

The language used in the second paragraph of the Frontier Project section on page 23 of the document that counsel referred to essentially is language -- recommended language from our independent resource assessor for use in documents published by Teck, including our annual information forum or a management discussion report.

And this links back to the comments I made earlier. The reason that independent resource assessors recommend this language is because there's still contingencies that apply to Frontier. We don't have regulatory approval for the project yet. The project hasn't been sanctioned yet.

So the appropriate language to use for market -- for information of materials that goes to the market is to use language like that to make sure that they're aware that there's contingencies in place as per
National Instrument 51-101. This appropriate language for communicating contingent resources to the public and in forums like annual information forum and management discussion.

So Teck management simply, for that paragraph, used the language recommended by our independent resource assessor to be appropriate for that document.

MR. STILWELL: So the two documents I just referred to, well, the responses to the information request and this document, the Management's Discussion and Analysis, are written for two different audiences.

MR. CHIASSON: Is that a question?

MR. STILWELL: Yes.

MR. CHIASSON: That's correct, Mr. Chairman. As part of the Frontier project application, it's understood that the company is applying for approval in that document. It's a different type of document, that, than information to shareholders, investors to the market, which is a total different type of document. And it's in that second that the language of the independent resource assessor is recommended for use.

MR. STILWELL: Now, Mr. Shewchuk, I want to turn to your work in response to Dr. Joseph's
cost-benefit analysis. And Mr. Shewchuk, did you write that document?

MR. SHEWCHUK: Pearce Shewchuk.

Mr. Chair, if Mr. Stilwell is referring to the document dated September 6th, then labelled as attachment 2, then the answer is yes.

MR. STILWELL: I'll just deal with one thing quickly to get it out of the way. You point out that Dr. Joseph made some arithmetical or numerical errors when dealing with air pollution damage calculations, and on page 5 those are set out. Is that correct?

MR. SHEWCHUK: Yes.

MR. STILWELL: And you highlight the numbers which were in error in red.

MR. SHEWCHUK: Mr. Chair, the numbers highlighted in red are those that we could not reproduce following the calculation steps laid out in the report of Dr. Joseph.

MR. STILWELL: Oh, I see. I thought you were stating that those are in error. You can't reproduce them.

MR. SHEWCHUK: Mr. Chair, we can reproduce the numbers in black following Dr. Joseph's calculation steps. The numbers in red do not appear to
follow the set of calculations he describes in the
document. In one such instance, I believe there's a
spreadsheet error. He simply applied the damage value
for one pollutant in substitution for the other.

MR. STILWELL: Okay. In any event, I
want to go to your conclusion about all of that. And
you say, "This difference has a negligible impact on the
result of the CBA." (As read in) Right?

MR. SHEWCHUK: Mr. Chair, that's
correct.

MR. STILWELL: And the result, when you
say "the result of the CBA," you're referring to
Dr. Joseph's CBA?

MR. SHEWCHUK: That's correct.

MR. STILWELL: Okay. Now you level a
criticism against Dr. Joseph's report and the use of two
discount rates. Correct?

MR. SHEWCHUK: Mr. Chair, that's
correct. Specifically, I critique the application of
differential discount rates, one being applied to costs,
and a separate and different rate being applied to
benefits.

MR. STILWELL: Right. And when we hear
from Dr. Joseph the 22nd of October, we'll hear from him
that he used eight per cent for benefits as a discount
rate for things like revenue which will flow to

government; correct?

MR. SHEWCHUK: I don't know that it's
my place to presuppose what Dr. Joseph will say, but
that appears to be what he's done.

MR. STILWELL: That's in his report,

isn't it?

MR. SHEWCHUK: Yes.

MR. STILWELL: And in his report he

used a three per cent discount rate for environmental
costs, air pollution, water pollution, GHG pollution, et

cetera. Correct?

MR. SHEWCHUK: Yes, that's correct.

MR. STILWELL: And you thought that

that was deserving of criticism based largely on a
document produced 11 years ago by the Treasury Board of
Canada Secretariat, entitled Canadian Cost-Benefit

Analysis Guide. Is that correct?

MR. SHEWCHUK: That's correct. It's

also curious, given Dr. Joseph's previous work.

Mr. Chair, in preparing for today, I

had the opportunity to review Dr. Joseph's Ph.D.
dissertation as well as a paper he delivered at the

United States Association for Energy Economics. And in

both documents, he provides a cost-benefit analysis of
the Karl bitumen mine. And in both those cases, he uses a single discount rate for costs and benefits.

MR. STILWELL: Okay. And at the bottom of page 5 of this guide from the Treasury Board -- oh no, at the bottom of page 5 in your report, Mr. Shewchuk, you say,

"The guidelines also recommend a real discount rate of eight per cent for regulatory interventions in Canada or a rate of three per cent for certain human health and environmental goods and services."

(As read)

So, so far, so good. Well, am I correct in this? When they say eight per cent for the regulatory interventions, do they mean a discount rate of eight per cent for the benefits?

MR. SHEWCHUK: If you looked --

Mr. Chair, if we look to the next bullet point in my memo, there's a quotation from the Treasury Board of Canada guidelines that specifically states that "whatever rate is used" -- I'm quoting, now -- "the costs and benefits should be discounted using the same rate."

MR. STILWELL: Right.
MR. SHEWCHUK: So I believe the
Treasury Board is suggesting eight or three.

MR. STILWELL: Eight or three, but use
the same ones for the two types of discounting you're
doing.

MR. SHEWCHUK: Uniformly applied, yes.

MR. STILWELL: Okay. And can you go to
page 37 of the guide of the Treasury Board branch of
Canada?

MR. SHEWCHUK: Yes, I'm looking at page
37.

MR. STILWELL: Okay. The very last
paragraph, and it spills onto page 38, it offers a
rationale for using a three per cent rate for social
costs. Do you see that there?

MR. SHEWCHUK: Yes, I do.

MR. STILWELL: But it concludes by
saying,
"Whatever rate is used, the costs and benefits should be
discounted using the same rate."

I can't find a rationale for that
guidance in this document from the Treasury Board of
Canada. Is there a rationale set out in this document
supporting the insistence on using the same discount.rate and don't use differential ones? Do you know?
MR. SHEWCHUK: Mr. Chair, the document doesn't provide explicit argument with respect to the application of a single discount rate; however, within the document it's quite clear that the discount rate is intended to reflect the rate of time preference for consumption. And I would argue that a different rate of time preference for one stream of benefits or costs as compared to another is incompatible with the basic premise of cost-benefit analysis.

MR. STILWELL: But I'm correct, they do not set out a rationale for that stipulated approach, do they?

MR. SHEWCHUK: Mr. Chair, I believe the guidelines are quite clear in that a single, uniformly applied discount rate is to be used. The argument is not elaborated on.

I'd like to note that in my work with other federal departments, namely Environment and Climate Change Canada, this topic has come up. And that department in particular is very clear that a single and uniformly applied discount rate is appropriate.

MR. STILWELL: But would you agree, that sounds to me more like a dictate than a principle supported by a foundation of reasons and logic? It's just a -- it's just a statement to use the same numbers,
isn't it?

MR. SHEWCHUK: The logic for applying a single discount rate, I believe, I can lay out in short order for the Chair.

Cost-benefit analysis is, in concept, the following. An analyst seeks to monetize costs and benefits so that when contemplating the net benefit of a project or policy or so forth, we're dealing with a single unit of measure, namely dollars. That sort of gets us past the difficulty of comparing, say, biophysical impacts with financial flows, which are measured in two different units.

Now, costs and benefits often occur over time. When costs and benefits do occur over time, we need to contemplate the rate of preference that individuals might have to, say, have a dollar today as opposed to have a dollar 10 years from now. The dollar today is worth -- has more value to me than one that I might receive 10 years from now.

In order to overcome that challenge, we apply a discount rate, as we've been discussing, which typically reflects society's rate of time preference. Different folks have different views. It could be three per cent or eight per cent, which is why the Treasury Board guidelines suggests a possibility of either.
Now, once we discount costs and benefits over time, we would then compare the present value of benefits to the present value of costs to determine if one outweighs the other. And if so, whether or not the project or policy being contemplated provides net benefit to society.

The application of differential discount rates suggests that we have a different rate of preference for certain dollars as compared to other dollars. So if we discount costs, as an example, using a discount rate of, say, 10 per cent, as I believe Dr. Joseph did, and -- or pardon me, I've got that backwards -- a discount rate of 10 per cent for benefits and three per cent for costs, what that does is it creates -- the larger the discount rate, the -- when you use a large discount rate, it reduces the present value of the stream of flows that you're contemplating.

So in using a large discount rate for project benefits and a comparatively smaller one for project costs, you end up in a situation where the present value of your benefits is less than the present value of your costs, or relatively speaking, than if they had been discounted using the same discount rate.

Now that's curious to me because the very first step in cost-benefit analysis is we turn
everything into dollars so that we don’t have to worry about where the streams of costs and benefits come from. We are no longer contemplating biophysical impacts as compared to financial because we have monetized everything. We are simply contemplating dollars. We’ve got our costs reflected in prices.

Now to subsequently go and manipulate the discount rate for one stream of benefits suggests that we weren’t confident in the conversion of say biophysical costs into dollar values initially.

The argument that’s typically made -- I wouldn’t say typically; I misspoke.

The argument that’s made when folks advocate for differential discounting is that environmental costs should be treated differently because of their scarcity in the environmental resource and cannot be replenished and therefore we should be putting comparatively more emphasis on the cost by using a smaller discount rate.

I would argue that fundamentally misunderstands cost-benefit analysis. If a resource is becoming more scarce, it’s the price that should escalate, not the number that demonstrates society’s preference for when it receives dollars.

So the correct way to demonstrate that
an environmental good is becoming scarce in an analysis like the one conducted by Dr. Joseph would be to escalate the price of the environmental goods, not manipulate the discount rate.

MR. STILWELL: Mr. Shewchuk, I’m back on page 1 of this guide and I’m looking at the third paragraph. It starts “Other countries” and it says:

“Other countries and international communities, such as the United States, Australia, the European Commission, etc., have also come to recommend that a cost-benefit analysis be the centre of regulatory analysis.” (As read)

That matches what Dr. Joseph says early on in his report about the adoption of cost-benefit analysis in other countries, doesn’t it?

MR. SHEWCHUK: Mr. Chair, that statement is consistent with one made by Dr. Joseph.

MR. CHIASSON: Mr. Chairman, I would like to add to my colleague Mr. Shewchuk’s comments.

The input-output model has been relied on in the regulatory context for all oil sands project approvals to date. It’s Teck’s view that using the input-output model accompanied with the environmental
impact assessment is a much better approach than the
cost-benefit analysis.

So Teck has followed the standard that
all oil sands project applications and approvals have
followed, using the input-output model accompanied with
an environmental impact assessment, and that we believe
is a more appropriate method to assess a project like
the Frontier Project versus a cost-benefit analysis
methodology that is much more sensitive, as Mr. Shewchuk
has pointed out, to the assumptions used for conducting
that analysis.

MR. STILWELL: Now, Mr. Shewchuk,
should a guideline or directive like this one we’ve been
discussing displace the exercise of professional
judgment in members of your profession?

MR. SHEWCHUK: Mr. Chair, these
guidelines have evolved over time and part of that
evolution has likely arisen from professional judgment,
the experience of folks undertaking this work.

MR. STILWELL: But if an economist
studies these subjects and forms a judgment that differs
from the guideline, he should ignore the guidelines,
shouldn’t he?

In other words, he’s saying the
guidelines is wrong in his judgment.
MR. CHIASSON: Mr. Chair, I would just like a moment to confer with my colleague.

MR. IGNASIAK: Mr. Chair, I am going to object. It is very hypothetical. There is nothing on the record that says anyone said that. I think Mr. Stilwell would acknowledge that nowhere does Mr. Gorski say he thinks that document is wrong.

There is nothing on the record showing that.

If Mr. Gorski wants to get on the stand, I look forward to him saying that. But I’m not sure it’s fair to ask a hypothetical to Mr. Shewchuk about not following guidelines when it’s not Mr. Shewchuk who hasn’t followed the guidelines.

MR. STILWELL: It’s perfectly appropriate to ask an expert witness giving opinion evidence hypothetical questions. It’s done all the time.

Then what you do, and in particular if you go after that, if your evidence comes in after that expert, you try to establish in evidence the facts that make out the hypothetical. It’s done all the time. I’m entitled to ask this expert opinion evidence a hypothetical question.

And I did not say Dr. Joseph came to
the opinion that the guideline is wrong. I’m saying if someone in your profession, after exercising judgment, concluded that guideline is wrong, he should reject it and not follow it.

THE CHAIRPERSON: Yes, carry on Mr. Stilwell.

MR. STILWELL: Okay. So I wasn’t suggesting Dr. Joseph has arrived at the conclusion. It is a hypothetical question.

If a member of your profession in considering these issues arrives at a conclusion, upon the exercise of his or her judgment, that something stipulated in this guideline should not be followed, then he or she should not follow it. Right?

MR. SHEWCHUK: Mr. Chair, it’s difficult to respond hypothetically. Ideally I would like to be able to review the argument for a deviation from the guidelines and make an informed decision at that point.

Presuming the argument was sound, perhaps exploration of deviation from the guidelines could be informative.

MR. STILWELL: I’m not sure what you are suggesting, Mr. Shewchuk.

What are you saying you want to do and
how do we do it?

MR. SHEWCHUK: Mr. Chair, I’m suggesting that simply arriving at a different conclusion isn’t sufficient to deviate from the guidelines. Arriving at a theoretically sound and defensible argument for deviating from the guidelines could be grounds for deviating from them.

MR. STILWELL: Okay, now I understand.

Now it’s 11 years old, this document.

MS LaCASSE: Mr. Stilwell, I’m sorry to interrupt you when you are really clicking along here, but just make sure you stay close enough to the mic, please.

MR. STILWELL: Yes, I walk around a bit. Sorry.

The document is 11 years old. Is there an ongoing revisiting of discount rates from time to time to accommodate changes in returns on investment over different periods?

MR. SHEWCHUK: Mr. Chair, I understand that the guidelines have evolved to the version we see before us from an earlier iteration where the discount rates were previously, I believe, 10 per cent.

MR. STILWELL: All right. Would it make sense to say we’re going to revisit this every ten
years as opposed to say we haven’t seen any changes in
the investment cycle, in the investment returns and
value of money for ten years, we’re going to leave it
alone?

Or do these kinds of changes occur more
likely on a 30-year span where investment return on
monies is lower and the value of monies is lower?

Does my question make sense?

In other words, maybe I should just try

and make it shorter.

What should drive revisiting discount
rates set out in a guide like this?

MR. SHEWCHUK: Mr. Chair, if I look at

page 37 -- pardon me, 38 of the guidelines, I see that

the government has established a Centre of Regulatory
Expertise that for a period of five years will assist
departments and agencies in the undertaking of
cost-benefit studies.

That suggests to me a timeframe that

the government may have had in mind.

MR. STILWELL: And at page 35 of the
guideline it states:

“Choosing a discount rate has
become one of the most contentious
and controversial aspects of the
cost-benefit analysis of regulatory policies.” (As read)

Do you agree with that?

MR. SHEWCHUK: Mr. Chair, choosing a discount rate can have a large impact on a cost-benefit study, as we’ve been discussing. And for that reason it has become contentious.

More to the point, a discount rate -- in this particular case a small change in the discount rate can reverse the outcome of a study. This is perhaps why cost-benefit studies ought not to be relied on in their entirety in situations such as this. A small adjustment to a key assumption can fundamentally undermine the analysis.

MR. STILWELL: Mr. Shewchuk, could you explain in language that I’ll be able to understand, or at least you think I’ll be able to understand, what a Monte Carlo exercise is?

Actually, let me back up. I want to ask one more question.

Determining an appropriate discount rate to be applied is very much a subjective exercise, isn’t it?

MR. SHEWCHUK: Could you please repeat the question?
MR. STILWELL: When an economist sits down and decides upon an appropriate discount rate to be used, he’s engaging in a subjective exercise.

MR. SHEWCHUK: Mr. Chair, I would argue that the guidelines provide guidance with respect to selecting a discount rate.

MR. STILWELL: Let’s ignore the guidelines for a minute. Let’s think about an economist retained in civil litigation.

The question is: Somebody is going to get a pot of money today which will cover years down the road, like a loss of future income claim. This guide wouldn’t apply to that economist at all. He’s not in the regulatory setting. But he will nonetheless determine an appropriate discount rate to determine net present value of the money the fellow should receive. And when he does so, he’s making a subjective determination.

Yes, in the guideline it’s objective. It’s fixed so that people in the federal government will know what to use and avoid debate. But when you are not using a document like this that stipulates what rate to be used, an economist is arriving at a subjective number, isn’t he, that calls for judgment?

MR. SHEWCHUK: Mr. Chair, I would
disagree slightly with that. I would say an economist undertakes an analysis in order to determine what an appropriate discount rate is, and that analysis needs to be thorough and defensible.

I wouldn’t characterize that as subjective.

MR. STILWELL: Okay.

THE CHAIRPERSON: Mr. Stilwell, not again wanting to interrupt, but we’re at about the point where I would be looking for a break. So I will let you pick the spot based on where you feel it would be appropriate to take a break.

MR. STILWELL: This is a good time right now, Mr. Chairman.

THE CHAIRPERSON: Okay, thank you.

Then we will take a 20-minute break right now. I have about 3:05 so we will return around 3:25.

--- Upon recessing at 1505 / Suspension à 1505
--- Upon resuming at 1527 / Reprise à 1527

THE CHAIRPERSON: Please be seated.

Before we get going again, just a reminder to the Teck witness panel to try and speak into your mics.

Mr. McFadyen, I think you in particular
have a habit of kind of sitting back and it’s a little hard for the Court Reporter to hear. Okay?

Thanks for that.

Mr. Stilwell.

MR. STILWELL: Yes. I would like just a simple explanation that I might be able to understand of the Monte Carlo exercise or analysis.

What is done?

MR. SHEWCHUK: Mr. Chair, a Monte Carlo analysis is -- and I will explain this at a fairly high level.

It’s basically an exercise where an analyst would use the historic distribution of an unknown parameter in the analysis, say price, to estimate future possible values.

So again taking the example of price, let’s say we knew what the price of a particular good was every day for the last year and we were able to build a probability curve so we could understand by using that data, the historical data, so we could understand the probability of a certain price occurring at a point in time.

Let’s assume that prices aren’t linked period to period, that they are randomly occurring, just for the simplicity of the example.
The basic idea is we tell a computer to go and grab a price out of that historic distribution and plug it in the analysis, solve it, store the result and then go grab another price from the distribution, stick it in the analysis, solve the result, store it, and do that over and over and over again.

The idea is that you use this process to generate a distribution of outcomes so that you can understand on a probabilistic basis what the final parameter might be that it is you are interested in.

MR. STILWELL: Thank you.

Now in Dr. Joseph’s report he itemizes a number of things which he says gives rise to costs. Some can be he thinks monetized, turned into a money amount and some he doesn’t.

So some of the things he tries to ascribe a cost to, or at least identify as a cost, were incremental government costs. Governments build roads, provide health services. And he says sometimes major projects. We look at the revenues and say that’s wonderful; we’re getting the royalties and taxes. But sometimes there’s additional costs because of that project.

I’m going to summarize these and then basically I’ve got one or two questions after I
summarize them.

For example, regulatory costs. A big project will increase regulatory costs on the part of the government.

Air pollution creates costs, he says, health related.

Greenhouse gas emissions creates costs, damage costs to Albertans and other Canadians and citizens of the world.

Water resources. He concludes that impacts on water resources, both in terms of quantity and quality, that was one that he couldn’t arrive at a monetary damage.

Ecosystem services. Affect land’s ability to provide eco services, systems.

User costs. The potential for foreign investment and leakage, and that is profit leaving the country.

Subsidies to the fossil fuel industry.

Social costs.

So those are some of the costs he discusses in his report. Not all of them can he feel comfortable ascribing a monetary value to.

Now in your rebuttal report, you do not refute the contention that those are costs and they
exist. Correct?

MR. SHEWCHUK: Mr. Chair, I don’t refute that those items are potentially costs.

I would like to point out that the difficulty of pricing things like this is precisely why in the case of a large project like the Teck Frontier one before us today is evaluated using an EIA. It’s a far more nuanced and detailed instrument when it comes to understanding the impacts of development.

MR. STILWELL: And the final one is a very minor point. It’s not a big number when we talk about the money and that is in your materials it is said that municipal taxes which will be paid to the Regional Municipality of Wood Buffalo over the life of the mine would be $3.5 billion. And you arrive at a net present value of $372 million.

Did Teck rework those numbers at all in light of the changes made to the Municipal Government Act in Taxation and Property Taxes within the last couple of years? And would you like to know about what those changes are?

MR. CHIASSON: I’ll confer with my colleagues, Mr. Chair.

--- Pause

MR. CHIASSON: Mr. Chairman, in
response to counsel’s question, Teck is aware of the change. I believe there was a reference to a response we provided to Package 5, where we...

--- Off microphone

Are we good? I’ll start again. So, Mr. Chairman, we are aware of the taxes or the new change proposed for the taxes in the municipality. When we did our work to respond to Joint Review Panel 5.1 in early 2017 we used the rates of the day. We do understand that the difference between the municipal rate and the industrial rate, the gap is too large, and that there is a move to try to reduce that gap.

That said, you know, the $3.5 billion estimate we used was using the rate at the time.

MR. STILWELL: That difference between the taxes of rural non-residential property or, in other words, industrial property and oil sands development, the ratio of the assessment of that type of property to the assessment of residential property, so a home in Fort McMurray, was 18:1.

You know that the oil sands industry approached first the municipality and then the provincial government, they didn’t like that and they wanted it reduced. The provincial government agreed to reduce that ratio from 18:1 to 5:1. You’re aware of
those details, correct?

MR. CHAISSON: That’s correct.

MR. STILWELL: Was Teck working on that initiative with the other oil sands companies?

MR. CHIASSON: Mr. Chairman, just a moment.

Mr. Chairman, we were aware. We weren’t directly involved in those discussions, but we were aware of the initiative from industry to have discussions of that nature.

MR. STILWELL: So if you use 18 to 5 you’ve got something that looks like a two-thirds reduction is necessary, to get it from 18 down to 5. But, of course, they can increase residential taxes in Fort McMurray, but you wonder how far they can get with that and still remain an elected official in the municipality.

But if we use that two-thirds number, don’t we reduce that MPV value from $372 million to -- well, take off two thirds of that. My math is not strong right now. So, again, it’s not a big number, but the municipality with the new provincial legislation should not count on receiving $372 million is the net effect, right?

MR. CHIASSON: So, Mr. Chairman, I
don't agree with that assertion. The gap needs to be
narrowed, we understand that. A decision on how that
gap is going to be narrowed with is industry’s rates
going to be reduced or is municipal taxes going to be
increased, or to what degree, has not yet been
determined. So it’s speculative to assume that
industry’s rates are going to be reduced. They
currently are what they are. They are what we’ve used
in our assessment. We understand the gap is to be
narrowed, but there’s been no determination about how
that is going to happen as of yet.

MR. STILWELL: Well, I thank all of
you. Those are my questions. My friend, Mr. Robinson,
has a couple more sets of questions.

Thank you very much.

CROSS-EXAMINATION

MR. ROBINSON: Good afternoon, Mr.
Chairman, Panel Members, participants of all types and
witnesses. For the record, once again, my name is Barry
Robinson, I am co-counsel to the Oil Sands Environmental
Coalition along with Mr. Stilwell. I'll be asking
questions primarily in three areas: greenhouse gas
emissions; tailings reclamation enclosure; and,
biodiversity. So that may mean some of you can relax
for a while.
At times I’ll be referring to information that’s coming from the Teck project update, from the information requests, and from the reply submission. I expect that most of the information will be very familiar to you and uncontroversial. But certainly, if the Review Panel or any of the witnesses want, you know, me to take you to the exact document where that number or quote is, just let me know and I’ll take you to that document.

Also, certainly if any of my questions are unclear, please ask me to clarify or try rewording it to make sure we’re all on the same page in our questions and answers.

Before I ask some questions about greenhouse gas emissions I want to just confirm my understanding of some numbers that come from the project update. So this will really just be initially in the way of confirmation.

So, first of all, am I correct that direct emissions intensity for the project is estimated at 38.4 kilograms of CO2 equivalent per tonne of bitumen production?

MR. SPELLER: Mr. Chair, I’m just going to repeat the units to make sure we’re on the same page. But we have 38.4 kilograms of equivalent CO2 per barrel.
MR. ROBINSON: Per barrel? Pardon me, that’s my error.

MR. SPELLER: No worries.

MR. ROBINSON: Direct and indirect emissions when you combine the two is 40.4 kilograms of CO2 equivalent per barrel, isn’t that correct?

MR. SPELLER: Mr. Chairman, that's correct.

MR. ROBINSON: At full production, the direct emissions would be 3,879 kilotonnes per year?

MR. SPELLER: Sorry, could you repeat that number again?

MR. ROBINSON: 3,879 kilotonnes per year.

MR. SPELLER: Mr. Chairman, that’s what our estimate is, yes.

MR. ROBINSON: Again, with direct and indirect emissions the number would be 4,082 kilotonnes per year, is that correct?

MR. SPELLER: Mr. Chairman, that's what our estimate is, yes.

MR. ROBINSON: So I take it then that there’s been no revision to those estimates since the project update? Have there been any subsequent engineering changes or engineering design work that
would alter those numbers?

MR. CHIASSON: Mr. Chairman, I can confirm there’s been no additional work since those estimates were developed.

MR. ROBINSON: Thank you. Am I correct that the only difference between the direct and indirect emissions is that the indirect adds in greenhouse gases related to imported electricity, is that correct?

MR. SPELLER: Mr. Chairman, that's correct.

MR. ROBINSON: So that’s electricity that’s generated off site and then brought in and used on site, is that correct?

MR. SPELLER: Mr. Chairman, that's correct.

MR. ROBINSON: So it's produced external to the project, but used on site?

MR. SPELLER: Mr. Chairman, again, that's correct.

MR. ROBINSON: Would you agree, electricity that is produced externally and brought on site is electricity that is produced upstream of the project?

MR. SPELLER: Mr. Chair, I’ve never referred to those sort of indirect emissions as upstream
before.

MR. ROBINSON: But you would agree that the electricity is produced external to the project and then used on the project site?

MR. SPELLER: Mr. Chairman, yes.

MR. ROBINSON: Thank you. Am I correct, and I believe this was alluded to in -- and I’m sorry, sitting back there I couldn’t tell whether it was Mr. Chiasson or Mr. Speller who was answering certain questions, but it was alluded to in one of your direct that the emissions that I’ve discussed so far did not include any allowance for greenhouse gasses associated with the production of natural gas that would be brought onto the site, is that correct?

MR. SPELLER: Mr. Chairman, that’s correct. The standard approach to looking at greenhouse gas inventories in the oil sands region for EIAs, or the ones that we’ve worked on the last 10 or 15 years, tends to include the direct emissions from the site, and then a request to include the electricity that’s also used at the site as an indirect. That’s typically the limit of what we include.

MR. ROBINSON: Would you agree that the natural gas that is produced and brought on the site is produce external to the project?
MR. SPELLER: Yes, Mr. Chair, I’d agree.

MR. ROBINSON: Similarly, the estimates of greenhouse gas emissions that we’ve run through did not include any allowance for greenhouse gas emissions associated with the production of gasoline or diesel or other fuels that are brought onto site, is that correct?

MR. SPELLER: Mr. Chair, that’s correct. As I mentioned, the standard approach to these sort of inventories and for oil sands projects is to include the direct emissions, and then the electricity that’s imported to the site.

MR. ROBINSON: Would you agree that those fuels though are produced external to the project and then planned to be used in the project?

MR. SPELLER: Yes, Mr. Chair, I’d agree.

MR. ROBINSON: The project update reflected a decision to increase the operating temperature for the project by 5 degrees Celsius. What was the impact of that change on the greenhouse gas emissions from the Project?

MR. CHIASSON: Mr. Chairman, I can answer that question. When we compare decisions for the design of the project we look at the project system as a
whole as opposed to the various components. So increasing the temperature by 5 degrees for better recovery of bitumen was part of the changes from the project application that was submitted in 2011 to the updated project in 2015.

But when I say we look at the systems, it’s because it’s inputs and outputs that have you arrive at the ultimate intensity for the project. So the changes that were made from the original project application in 2011 to the project update submitted in 2015 reduced greenhouse gas emissions on the whole from I believe it was 40.4 kilograms per tonne equivalent of greenhouse gas emissions to 38.4.

There’s a number of inputs and outputs that contribute to that. So it’s a bit of a long answer, but improving the recovery of the barrels was one input with raising the temperature. Another input was the change to the tailings plan which had us build more of the tailings facility with processed sand versus innerburden material that would need to be hauled long distances with trucks.

So when a design or a plan is changed there’s a number of elements that change. The net result of the process temperature change, along with all other changes, resulted in a lower intensity design than
what we had in 2011, and that includes the increase in temperature.

MR. ROBINSON: Would you agree that if you looked at the temperature increase alone that the tendency would be that that would increase greenhouse gas emissions?

MR. CHIASSON: Mr. Chairman, I would agree the temperature increase in that component would contribute more to greenhouse gas emissions.

MR. ROBINSON: Did you make any estimate or any calculation of what that would be, the change due to the temperature increase?

MR. CHIASSON: Mr. Chairman, as I stated earlier, we didn’t look at the individual component, we looked at the system changed, and the overall design and the overall plan from what we had in 2011 to 2015, as opposed to looking at the various components we evaluated the system.

MR. ROBINSON: You alluded to this, that with the change from thin lift drying to centrifuge fine tailings that there was an increase in overall electric power load. I have it from your project update that that increased the overall electric power load from 289 megawatts to 319 megawatts. Can I assume that this is similar to the temperature increase, that you didn’t
calculate the exact impact of that change alone?

MR. CHIASSON: Mr. Chairman, that’s correct. This was part of the system change that was that as the design changed the various components we didn’t evaluate, we evaluated the plan on its entirety. So that’s correct.

MR. ROBINSON: You’ve put out a number. The number I have here is that direct and indirect emissions from the integrated application were 46 kilograms CO2 equivalent per barrel, and then it dropped, when you include direct and indirect, to 40.4 kilograms CO2 equivalent per barrel in the project update. That’s, you know, despite there being some increase due to operating temperature and to electric power load.

So, obviously, there were other offsetting changes that brought that down. Can you tell us what some of those were?

MR. CHIASSON: Mr. Chairman, an example would be on the system when changed from the integrated application to the project update, is with the change in the tailings plan and using more -- taking into account better, I would say, the project site-specific conditions, and using the tailing sand, that is waste from the extraction process, mainly as the containment
material for the tailings. So that long distances with haul trucks were no longer required to build more of the containment.

That haul distance reduction was one example of a system change that resulted in a reduction to greenhouse gas emissions, as an example.

MR. ROBINSON: Do you have any idea of the percentage or the total quantity of GHG emissions that were reduced by that haul distance change?

MR. SPELLER: Mr. Chairman, we’ve actually provided a response that has some of the information that’s been requested. I’m going to try to make sure I get the right numbers. It’s Registry Doc 268, it’s Package 3 of the Joint Review Panel information requests, it’s Request 3.15, and it’s on PDF page 96 of 121.

Then you’ll see there’s a list of bullets about some of the changes, large and small, related to the changes that were shown in the project update. It talks about the more efficient mine plan without the utility corridor, reduced average haul distances, and other items related to the reduction in greenhouse gasses from the project design.

MR. ROBINSON: Thank you. I believe right below the table or close to the table you referred
to there’s a table 3.15(b)(1), which runs from page 3-92 to 3-94 of that IR response. It lists a number of technologies that Teck, I believe, was labelled as might consider to reduce greenhouse gas intensity.

Base on further engineering work and design work since the project update, or since that IR, has Teck decided to incorporate any of these technologies into the project?

MR. CHIASSON: Mr. Chairman, the answer to the question from counsel is no. These are emerging technologies. We are committed to look, continue to look for ways to continuously improve and adapt as technologies emerge. There are ways and means to reduce emissions intensity.

This is a list from our participation in Canada’s Oil Sands Innovation Alliance. As a founding member, even though we’re not yet an operating in the oil sands, we are working with a number of the other oil sands companies to look at technologies to reduce emissions intensity. This is an evaluation of emerging technologies with a comment on do we think that some are more promising, et cetera.

That said, none of these have yet been adopted by Frontier. We would look in the future for technologies that we thought could help reduce emissions
intensity. These are ones that are emerging that we’ll be keeping a close eye on to see if there’s an opportunity to improve our project and improve our emissions intensity.

MR. ROBINSON: At this point Teck is not committed to implementing any of the technologies that are listed in Table 3.15(b)(1)?

MR. CHIASSON: So, Mr. Chairman, that is correct. We have not yet committed to adopting these technologies; as I mentioned, they’re emerging. From our participation in COSIA, as an example, we’re keeping a close eye on them and if we believe there’s an opportunity from the emergence of these technologies to improve the greenhouse gas emissions intensity and improve the Project, we will look to adapt the Project at that time. It’s premature for these at this stage for Frontier.

MR. ROBINSON: Mr. Chiasson, in your direct testimony this morning, if I recorded this correctly, you referred to an IHS report and said a 24 percent reduction in GHG intensity is possible without transformational technology. What are those technologies that are not transformational that could be used?

MR. CHIASSON: So, an example of
technologies that are not transformational that could be used, one example would be the paraffinic froth treatment technology. So, a number of current operators have adopted that technology in the past decade, and those projects utilizing that technology have a lower emissions intensity comparatively to other oil sands producers. So, that is a technology that has been developed, adopted, and is now in commercial use. When Teck designed the Frontier Project, that was the technology that we implemented into the design and that’s the basis for the part of the extraction process, is using that technology and that approach.

And that is one of the technologies that mining bitumen companies have been able to include to help reduce their intensities.

MR. ROBINSON: And as you say, the PFT technology has already been incorporated into the Project update?

MR. CHIASSON: That is correct, MR. Chairman.

MR. ROBINSON: And the emission numbers that we started out confirming were based on that technology?

MR. CHIASSON: That is correct.
percent reduction that you quote from IHS is already built in, already been achieved? Well, achieved in the sense that it is built into the design?

MR. CHIASSON: The reference to the IHS market report of September 2018 stated -- in that report it stated mining companies have been able to reduce their emissions from 2009 to 2017 by 25 percent. And my remarks to the previous question was part of the reason for that is utilization of the paraffinic froth treatment process, and Teck has that process incorporated into its design for Frontier.

MR. ROBINSON: So this isn't a reference to 24 percent improvement, but that might be made on greenhouse gas emissions in the future; is that right? I'm confused because I thought the answer when you gave it, or when you stated this morning there was -- as evidence of how future technology will reduce greenhouse gas emissions. But, it sounds now like you're referring to something that's already built in?

MR. CHIASSON: Mr. Chairman, there's two references I made earlier. One, was -- well, sorry, apologies. The reference I made earlier was in the past. I believe counsel is referring to the same report which suggest IHS market suggests that mining companies, their estimation is that there is potentially as much as
24 percent more improvement by 2030 with mining companies. That statement is also in that report.

MR. ROBINSON: And that was without transformational technology, if I heard you right this morning?

MR. CHIASSON: That is correct.

MR. ROBINSON: And, so I'll ask my question, beyond the paraffinic froth treatment are there any other transformational technologies that you foresee being used on Frontier Project to reduce greenhouse gas emissions?

MR. CHIASSON: I want to make sure that I heard your questions correctly. Are you asking me for what the transformational changes are, or what technologies is there that are not transformational?

MR. ROBINSON: Let me try and clarify that for you. So, in your statement this morning if I recorded it properly, you said that IHS said that they have 24 percent reduction in GHG intensity, and I take that meaning going forward, is possible without transformational technology. And you’ve referred to PFT, but I’m wondering is that it, or are there other transformational technologies that would get that 24 percent reduction?

MR. CHIASSON: Mr. Chairman, an
example -- I can't speak for IHS market and their assessment that there's another 24 percent or up to 24 percent improvement they feel that mining companies can make, so I can’t speak for them. But, I would point to Table -- I would point to the table that counsel has referenced, Table 3.15 B-1 on PDF page 97 as a list of the emerging technologies, some of which could prove commercially viable that mining companies could use to improve their emissions intensity.

MR. ROBINSON: In Joint-Review Panel Information Request 5.1 A(2), Teck calculates the cost of compliance under the Specified Gas Emitters Regulation using a $30 per tonne value for greenhouse gas emissions as $635 million over the project life. Now, as, again, someone said this morning that was a conservative calculation because it does not assume any improvements, but it was the calculation put in, I take it, as kind of a worst case scenario; is that right?

MR. CHIASSON: The response to Joint-Review Panel question in Package 5, which asks for the estimated cost of carbon, the request was using the regulation of the day what is Teck’s estimate of the cost of carbon for the Project. So, Teck -- the regulation of that day which was early 2017 was the Specified Gas Emitters Regulation which had a cost of
carbon of $30 which required up to a 20 percent improvement over time from a specific project.

So, Teck was aware at that time that there was emerging regulation which was not yet in place, which was intended to be -- we were aware that there was newer emerging regulation, so our approach to estimating the cost of carbon was we wanted to be very conservative with the old regulation, understanding that a more stringent regulation was going to be coming into effect.

So, our estimate of $636 million using the *Specified Gas Emitters Regulation* was developed on that basis, to try to be as ultra conservative as we could be using that regulation understanding that there was a new regulation that was pending that was intended to be more stringent.

MR. ROBINSON: So, the $635 million price was the cost was calculated under the *Specified Gas Emitters Regulation* at $30 a tonne. As you say, that was the regulation of the day. We have a new regulation of the day which is the *Carbon Competitive Incentives Regulation* and we know that the base price will be at least $50 a tonne when the project commences. Has Teck calculated on the same comparable basis what the cost of compliance would be under the new regulation
and at $50 a tonne?

MR. CHIASSON: Yes, we have, Mr. Chairman.

MR. ROBINSON: Can you share that value?

MR. CHIASSON: Absolutely. Mr. Chairman, utilizing the new regulation which I will refer to as the CCIR, it’s the Carbon Competitive Incentive Regulation, Teck’s assessment of carbon costs for the project is not materially different than that assessed using the Specified Gas Emitters Regulation. So, our estimate in response to Joint-Review Panel Package 5.1 or Package 5, Question 5.1 of $635 million, our updated estimate using the new regulation CCIR is not materially different.

MR. ROBINSON: Could you tell us what that value is?

MR. CHIASSON: Mr. Chairman, we looked at a number of scenarios. When looking at the new CCIR regulation there’s a couple of elements, or there’s elements that reflect the carbon costs for the project. Two of those elements are relative to the output based allocation of a reference facility what is Teck’s estimated intensity relative to that? And, compared to that, the cost of carbon that we used was $50 a tonne.
for the amount of emissions that would be over the reference amount.

MR. ROBINSON: And what was that value?

What was the cost? I still didn’t hear the cost in the response, there.

MR. CHIASSON: Oh.

MR. ROBINSON: It’s $635 million under the old. What’s the cost -- the potential cost under the new?

MR. CHIASSON: Okay. MR. Chairman, I thought I answered that question. It’s not materially different. We did a scenario that resulted in $600 million of costs. We did a scenario that resulted in $700 million worth of costs. And we did a scenario that resulted in $750 million worth of costs with the various aspect of output based allocation and a $50 carbon tax.

MR. ROBINSON: Was the $750 million cost the highest of the scenarios that you ran?

MR. CHIASSON: Mr. Chairman, that's correct.

MR. ROBINSON: And did that use the CCIR regulation exemption of, I have it as 0.1894 tonnes of CO2 per meter cubed started at 2022 and then declining by 2 percent -- the output based allocation declining by 2 percent per year? Did your scenarios use
that number?

MR. CHIASSON: Mr. Chairman, that’s correct.

MR. ROBINSON: And did it decline by 2 percent year out for the life of the project?

MR. CHIASSON: Mr. Chairman, it did not. So there’s a number of reasons for that.

We look at the likelihood or the non-likelihood of, for the next 50 years, the next five decades, that output-based allocation continually becoming more stringent every year regardless of what the rest of the world, the other oil-producing jurisdictions, are doing.

And the fact that other jurisdictions have been slow to implement carbon legislation informs our assessment that it's not likely -- while it's possible, it's not likely for the output-based allocation to become more stringent every year for the next 50 years.

And also what informs that is the fact that both the Government of Canada and the Government of Alberta have stated that they will protect trade exposed sectors to carbon leakage. And carbon leakage is if Canada's or Alberta's laws become so stringent and other jurisdictions have not kept pace with countries like
Canada, what could actually be happening on a global basis is a more carbon intensive barrel with less stringent regulation in some other jurisdiction could actually be produced in place of a lower intensity barrel in Canada.

And we don't think that that's -- we think because of the commitment by the Government of Alberta and the Government of Canada to not -- or to protect trade-exposed sectors that at some point, when the rest of the world doesn't keep pace with Canada, that they won't continue to make the output-based allocation more stringent year after year after year for the next 50 years.

We think that's a more likely scenario, that they will not continue to do that for the next five decades.

MR. ROBINSON: Do you agree that the current carbon competitive CCIR regulation has the output-based allocation declining by 0.2 percent per year from 2022?

MR. CHIASSON: Mr. Chairman, as per my comments previously, I understand that that is what the Carbon Competitiveness Incentive Regulation includes.

It also will consider, it also will take into account, according to the Government of Canada
and the Alberta government, whether the stringency is
outpacing other jurisdictions and if the government
needs to protect trade-exposed sectors from carbon
leakage.

So in consideration of that, we don't
think that the regulation is going to get more stringent
every year on year if other jurisdictions are not
keeping pace.

That's not the intent of the
regulation, and we don't think it's likely to occur.

MR. ROBINSON: Have you had any
communication from the Government of Alberta indicating
they intend to amend the CCIR?

MR. CHIASSON: Could you please repeat
that question?

MR. ROBINSON: Have you had any
communication from the Government of Alberta indicating
that they intend to amend the CCIR?

MR. CHIASSON: One moment to confer
with colleagues, Mr. Chair.

--- Pause

MR. CHIASSON: To answer counsel's
question, yes, we are aware that the government plans to
amend or change or revisit the CCIR regulation. In
fact, they're going to do that every five years. The
next time is in 2022.

MR. SPELLER: Mr. Chairman, the CCIR discussion we're having reminded me I was remiss earlier in our discussion about direct and indirect emissions.

The emissions inventory approach that we've done with direct emissions and the imported electricity is consistent with CCIR reporting where operators look at direct emissions plus imported electricity, imported thermal energy and imported hydrogen.

I should have said that earlier.

MR. ROBINSON: Thank you.

The response to JRP IR-3.15(e) provides estimates of GHG intensities for other operating and planned oil sands projects. And these are summarized from page 3-99 through about 3-103.

There's estimates for various projects and estimates from various sources in those pages.

I would characterize them as kind of all over the map. Is that a fair characterization?

MR. SPELLER: Just to confirm, this is a long response.

Are you looking at the bullets on the bottom of page 3-102?

MR. ROBINSON: We could look there, but
I was looking at, you know, the actual text that's -- it starts on 3-98. GHG emissions and intensities for other oil sand facilities are presented and discussed, and it goes on for the next three pages.

Yeah, and then they're kind of summarized at the bottom.

MR. SPELLER: Yeah. Maybe if we look at the summaries from the bullets. But in general, what we see in the text and then there's tables below are what we tend to see for operating facilities as when they report their greenhouse gas emission inventories. Different years, different fuel uses, different activities at the site, you do get a range of emission intensities.

And since we are talking about intensities, they're driven by the production rate in that year of the operation which, as projects approach maximum capacity, can vary year to year.

MR. ROBINSON: Do you have any updated estimates from any of the projects that are listed in there, for example, Fort Hills now up and running, obviously, in early stages. But have any of the other projects provided more up-to-date comparables?

MR. SPELLER: So Mr. Chairman, the different operation report numbers every year. We
haven't summarized something that's on the field record at the moment.

MR. ROBINSON: Okay, thank you.

I have a question about oil sands production forecasts just because it came up earlier.

But in Project Update Volume 1, Section 1.3.7.3, page 1-14 -- this is CEAA doc 163 -- it states that the:

"Canadian blended bitumen supply is expected to increase from 2.0 million barrels per day in 2013 to 4.7 million barrels per day by 2025."

Is that correct?

MR. CHIASSON: I'm still looking for the reference.

MR. ROBINSON: I'll give you time to find it.

MR. CHIASSON: Sorry.

MR. ROBINSON: It was your Project Update Volume 1, page 1-14, if that helps.

I'll just make sure that I have that reference correct. It's under "Market Analysis", the second bullet.

So I'll just repeat the question.
You do have it now? Okay.

So am I correct that the market analysis in the project update states that:

"Canadian blended bitumen supply is expected to increase from 2.0 million barrels per day in 2013 to 4.7 million barrels per day by 2025."

Is that correct?

MR. CHIASSON: Mr. Chairman, that's what that bullet states.

The analysis that we would have done that would have been conducted in 2014 when -- when the price of oil in August of 2014 was more than $100 a barrel, our analysis that informed the project update described in this bullet was that oil production from Canada or Canadian blended bitumen supply would increase to 4.7 million barrels by 2025.

Of course, our view on that, like what CAPP suggests, like what IHS Market suggests, after the decrease in oil price and increased -- or the introduction of the carbon legislation, that has slowed production since that implementation.

But this is the -- this is the bullet and the analysis of the day from late 2014/early 2015.
that was included into the project update.

MR. ROBINSON: So in the project update, Teck's analysis of potential supply and demand for oil sands bitumen was based on that 4.7 million barrels by 2025. Is that correct?

MR. CHIASSON: Mr. Chairman, that's part of the market analysis that was conducted at that time. That's correct.

MR. ROBINSON: And was Teck's analysis of the economic benefits of the project in the project update based on that market analysis?

MR. CHIASSON: Mr. Chairman, I wouldn't agree with that, actually.

The analysis that influenced Teck's assessment for the price, the revenue, the royalties was based on -- as described in our response to Joint Review Panel Question 5.1, it was based on the -- a more global assessment of the demand for oil.

So the International Energy Agency at that time, I believe it would have been the 2015 or the 2016 report that they provided, that showed the demand for oil increasing up to 2040 and the price increasing to above $95 and above after 2026, that was the analysis that more so informed Teck's assessment of the economic setting during the time that -- if the project was
approved during that -- the project operation.

MR. ROBINSON: So there was -- there

has been, though, you're saying, a change in the market

outlook for bitumen from the time the Project Update was

produced until today.

MR. CHIASSON: That is correct, Mr.

Chair.

MR. ROBINSON: And did you adjust your

economic forecast based on that in terms of benefits?

MR. CHIASSON: That is correct, Mr.

Chairman, but our analysis remained consistent with what

we provided in the Project Update. And from what we've

provided in our response to 5.1, Joint Review Panel

Question 5.1, to -- until today, the oil sands -- or not

the oil sands. The oil forecast organizations such as

International Energy Agency and the U.S. Energy

Information Administration, to name two, their forecasts

for global demand remain consistent with what was used

in 2015 for the project update to what was used to

respond to Joint Review Panel Question 5.1 up to the

last report that was issued by the International Energy

Agency in November of 2017, that still remains

consistent with our assumptions.

MR. ROBINSON: Thank you.

I've reviewed Attachments 34, 35 and 36
to the Teck reply submission which are, just for your information -- one's called "Horizons 2017 Sustainability Report". The second one's called "Our Strategy for Climate Change", and the third one "Climate Action Portfolio Resilience".

These are all documents prepared by Teck. Is that correct?

And if I’m correct based on those documents, Teck, has been mentioned earlier, set a target to reduce greenhouse gas emissions from existing operations by 450,000 tonnes by 2030 from a 2011 baseline. Is that correct?

MR. CHIASSON: Mr. Chairman, that is correct.

MR. ROBINSON: And that Teck is ahead of their expected progression to that target, having reduced emissions, I understand, by 281,000 tonnes by 2017, for which you are to be congratulated. Is that correct?

MR. CHIASSON: That -- well, that is correct.

I was trying to be humble there, but.

MR. ROBINSON: Thank you.

And I -- and Teck's total greenhouse gas emissions from all operations globally in 2017 was
MR. CHIASSON: That is correct, Mr. Chairman.

MR. ROBINSON: Now, earlier, I believe it was Mr. Gray -- and you've made some reference, too, Mr. Chiasson, just now, to the International Energy Agency forecasts.

And I believe Mr. Gray said that Teck relied on the International Energy Agency forecasts and that your position was that those forecasts are, you know, sort of viewed as fairly reliable. Is that correct?

MR. CHIASSON: Mr. Chairman, I believe it was myself that made that comment earlier, and we chose -- as a reference, we chose the International Agency's forecast to conduct the socioeconomic analysis from.

We did look -- we did look at a number of oil price forecasts. We also considered the U.S. Energy Information Administration as an example as well.

And from our look at several forecasts or a number of forecasts, that informed our view of what the oil price and the world oil demand would be.

Two of the pre-eminent forecasts that we used were the IEA and the EIA, as I mentioned
earlier.

    MR. ROBINSON: Thank you.
    And if I'm correct, the number I heard
earlier today was that forecast would be 110 million
barrels per day by 2040. Is that correct?

    MR. CHIASSON: Mr. Chairman, there --
the world energy outlook evaluation conducted by the
International Energy Agency, their base case forecast
indicates -- shows that world demand for oil will
increase from 95 million barrels a day today to 110
million barrels, or about 110 million barrels, by 2040.

    MR. ROBINSON: Thank you.
    I just want to turn to page 17 of your
Climate Action and Portfolio Resistance. That's
Attachment 36 to your Teck reply submission.

    MR. CHIASSON: I have it.
    Hard copy page 17?

    MR. ROBINSON: Hard copy page 17.
    So this -- if I read the opening
paragraph correct, this is an IEA, so International
Energy Association -- Agency, two degree scenario
describes a world transformed on track to limit global
warming to two degrees C by the end of the century. Is
that correct? Is that what that says?

    MR. CHIASSON: That's correct.
MR. ROBINSON: And then under Scenario Highlights, it says:

"Under this IEA scenario, oil demand peaks before 2020. By 2040, oil demand is more than 20 megabytes lower than today, at 72 point -- million barrels, sorry, per day at 72.9 million barrels."

(As read)

Is that correct?

MR. CHIASSON: Mr. Chairman, that is what this paragraph says, and it's what the IEA's low case or low oil price case scenario reflects.

It is, however -- as I mentioned earlier, it's not their base case forecast. This is a scenario forecast, which they provided, that reflects what's written in the first paragraph on page 17.

MR. ROBINSON: Would you agree, then, that the 110 million barrel per day scenario would be inconsistent with the two degree scenario under the Paris Accord?

MR. CHIASSON: Mr. Chairman, in fact, the International Energy Agency forecasts suggest that the base case forecast that they have developed more so reflects a 2.7 degree scenario and that they -- the
scenario described as counsel has pointed to that's in
Teck's report, the two degree scenario is a different
scenario.

    MR. ROBINSON: And would you agree that
the 2.7 degree scenario would not be consistent with the
Paris Accord?

    MR. CHIASSON: Mr. Chairman, I don't
know if I would agree with the way that counsel has
characterized that.

    I know that the goals of the Paris
Climate Change Accord was to achieve two degrees
increase in temperature from pre-industrial levels.
That said, for example, not every country that has
signed up to the Climate Change Accord, such as the
United States as an example, who have since backed out
of that Accord -- not every country or signatory of that
Accord is living up to their obligations. I guess
that's the first point I'd make.

    And the second point I'd make is, based
on the commitments of the signatories of the Accord, the
IEA's assessment of the results of those commitments
reflect the 2.7 degree scenario versus the two degree
scenario.

    MR. ROBINSON: And just to be
absolutely clear, the scenario presented on page 17 of
Teck's Climate Action and Portfolio Resilience would indicate that to meet a two degree limit to a two degree climate change by the end of the century that, under that scenario, oil demand would fall to 72.9 million barrels per day. Is that correct?

MR. CHIASSON: The drop in demand for oil that counsel has suggested is consistent with the scenario of two degrees that the International Agency developed. That's correct.

MR. ROBINSON: Thank you.

Is Teck familiar with Canada's mid-century long-term low greenhouse gas development strategy?

And just if it helps, that's a document that was in OSEC Submission Tab 18. It's Canada's mid-century long-term low greenhouse gas development -- greenhouse gas emission development strategy.

MR. CHIASSON: Just looking for the reference.

--- Pause

MR. CHIASSON: Sorry. I wasn't clear whether this was part of the materials that was submitted on Friday or previously.

MR. ROBINSON: No, it was not part of
the -- this was in 06, original submission on August 31st. And it was Tab 18 of that submission.

MR. CHIASSON: Okay, I have it.

MR. ROBINSON: Okay, I'll take you to -- so prior to this, no one at Teck was familiar with this document?

MR. CHIASSON: Mr. Chairman, Teck was aware.

MR. ROBINSON: And then was Teck aware that this document indicated that to meet the Paris Agreement that Canada would have to go through an 80 percent reduction in national GHG emissions by 2050 from 2005?

MR. CHIASSON: Just one moment to confer with colleagues, Mr. Chairman.

Mr. Chairman, yes, it's our understanding that that's correct.

MR. ROBINSON: And so you would understand, then, that Canada's target for total GHG emissions, if they're going to be consistent with the Paris Agreement by 2050, the total national GHG emissions would be 149 megatonnes. Would you agree with that number? And it's found in the annex to the document we're talking about on page 83.

MR. CHIASSON: Could you please repeat
the number.

MR. ROBINSON: It's page 83, it's Annex 1, Table A1. And we really just need to look at the top line, which shows -- of that table, which shows emissions going from 613 megatonnes in 1990 to 748 in 2005 to 149 in 2050.

MR. CHIASSON: Mr. Chairman that is what the table says.

MR. ROBINSON: Thank you.

So that would be an 80 per cent reduction in Canada's greenhouse gas emissions.

Assuming those were distributed evenly across various industrial sectors and operators, has Teck analyzed any scenario in which the Frontier project emissions would have to be reduced by 80 per cent by 2050? And that would be down to something probably less than a thousand kilotonnes per year. Has Teck costed that out or looked at that at all?

MR. CHIASSON: So, Mr. Chairman, in response to counsel's question, the way that Teck viewed this was -- and I guess if I understand the rationale for the question is how is the Frontier project consistent with Canada's goals and Alberta's goals, is what I understand the question to be.

And has Teck assessed that? The answer
would be yes. And the way that I would respond to that question is the pan-Canadian framework has recognized that Alberta's contribution to managing climate change has been to phase out thermal coal production, to place a levy on carbon emissions and a limit on oil sands emissions, so to enact those elements.

The fact that the Frontier project is amongst the lowest GHG emissions intensity compared to other oil sands production, and that's on a local emissions basis, so a direct emissions comparison. But some might argue that's not apples to apples; you should look at the full cycle, so wells to tank or wells to wheels.

In all three comparisons, paraffinic froth treatment bitumen products such as Teck's Frontier project is amongst the lowest GHG intensities compared to all other oil sands production. And that's on a direct emissions comparison basis, on a wells-to-tank, or on a wells-to-wheels.

In fact, in addition to that, so in addition to Frontier being amongst the lowest of all oil sands production on an intensity basis, it is also lower than about half of all of the oil refined in the United States.

So Teck looks at how it fits with the
pan-Canadian framework and the Alberta climate leadership plan and climate action, and it also looks within North America and compares how it stacks up against other sources.

So the reason that -- so Teck feels that Frontier project is consistent with Alberta's and Canada's climate action goals because it offers a lower-intensity GHG production compared to other sources of oil production from the oil sands. In fact, it's in the top 25 per cent, or it would be in the top 25 per cent of all oil sands production sources on an apples-to-apples, wells-to-wheels basis.

So the world needs oil. Oil forecasts have suggested that the demand is going to increase. And how Teck feels it's contributing to climate action and moving towards a low-carbon economy is that the production from Frontier is going to be a lower emissions intensity than other oil sands sources or most other oil sands sources -- 75 per cent of other oil sands sources.

So with that in mind, Teck feels the Frontier project is consistent with Alberta's goals and Canada's goals for climate action.

MR. ROBINSON: Let me try again. Has Teck costed out the cost of what it
would cost Frontier project to have emissions less than a thousand kilotonnes per year by 2050?

MR. CHIASSON: Mr. Chairman, the answer to counsel's question is no, we have not.

MR. ROBINSON: Does Teck feel that it's reasonable, then, in a 2050 scenario in which Canada's emissions are targeted at 149 megatonnes per year, that the oil sands would account for 100 megatonnes of that?

MR. SPELLER: Mr. Chairman, I was hoping to make just an observation on this topic.

Fundamental to counsel's question is the assumption that the rest of Canada adopts technologies that allows us to hit the 2050 targets, but the oil sands does not innovate at all and stays at the hundred. And it is one thing I've always found curious when I look at these comparisons, the assumption that the technologies that are going to help Canada hit their 2050 targets don't seem to apply to the math that's used to look at the emissions limit for oil sands. I think if you look at the IHS Markit 2018 report that -- we've included a link in our September 12th, I think you'll see a better projection or a concept that the innovation of technologies that could help Canada hit those targets will have some applicability to oil sands. And in the future, it
doesn't mean that oil sands will be at the hundred when
Canada is trying to hit its goals.

MR. ROBINSON: Would you agree that if
moving from 2005 to 2050 and 80 per cent reduction was
distributed across all industries and proportionately,
that then the oil sands would be look at total oil sands
emissions of something in the order of 20 megatonnes
instead of a hundred megatonnes by 2050?

MR. SPELLER: Mr. Chairman,
hypothetically, if it was done linearly, yes. This
mid-century report that we're discussing at the moment
has visions for oil sands technology dropping their
emissions by 50 per cent and Canada being able to hit
that mid-century goal. But hypothetically, if it was
linear across all sectors, all sources, that would be
the number.

MR. ROBINSON: As I mentioned, I
actually enjoyed reading these three documents, the
Sustainability Report, Our Strategy for Climate Change,
and the Climate Action Portfolio Resilience.

And if I can put it in small business
kind of terms, when I read those, I kind of viewed it as
a small business that had a dozen pickup trucks. And
they seemed to be moving in the right direction; they
were doing some good things. As those pickup trucks
came up for renewal, they switched them over to propane or natural gas. They had targets to reduce their emissions.

Maybe they decided even that their sales staff didn't need a pickup truck, so they bought then a Prius.

So I see -- you know, when I read your reports, I see a company moving in a right direction, except for then suddenly the small company buys two Hummers, and it just doesn't make sense. And that's kind of where -- how I look at the Fort Hills and Frontier projects.

And it just -- now to come to the question. Am I correct, then, that the GHG emissions from all Teck operations in 2017 were 3,010 kilotonnes, and the Frontier project would add 3,879 kilotonnes per year in direct emissions, more than doubling all of Teck's corporate emissions right now?

MR. CHIASSON: Was that a question?

MR. ROBINSON: That was a question.

MR. CHIASSON: Mr. Chairman, that is correct. The addition of the Frontier project would increase Teck's overall emissions by -- approximately by the amount stated by counsel.

That said, it's consistent with Teck's
goals of moving to a lower carbon economy in this respect, and it's the same comments I made earlier:
Teck prides itself in providing commodities that's going to help the world move to a lower carbon economy, and it also provides commodities that people need. So the consistency for Teck diversifying into oil sands, it's into mining oil sands. We're a mining company.

The consistency with Teck's strategy is that the operations we've invested in in the oil sands -- we're part owners of Fort Hills and the Frontier project -- employs among the lowest GHG-intensity technologies. And the Frontier project will have, and Frontier, should it be approved and built, it will have amongst the lowest intensities of GHG emissions amongst all other oil sands production, and lower than half of all of the oil refined in the United States.

So by doing so, Teck is helping to displace more GHG-intensive barrels that would otherwise be produced from somewheres else to meet the demand. So by providing a product that is amongst the lowest GHG intensities of any oil sands, Teck is helping to fill the need or would be helping to fill the need or the demand for oil in a GHG-intensity-low manner relative to other sources in the oil sands.
MR. ROBINSON: Mr. McFadyen, in your direct testimony this morning, said that the reduction of 281,000 tonnes of CO$_2$ from Teck's current operations was equivalent to taking 60,000 cars off the road.

Over the break I did a little calculation, and I'll give you some time if you want to make the calculation, would you agree that the direct emissions from Frontier would be equivalent to putting 830,000 cars on the road?

MR. CHIASSON: Mr. Chairman, we have not done that calculation.

MR. ROBINSON: Mr. Chairman, this is a good point at which for me to break, and I'll pick up in the morning, if that works for you.

THE CHAIRPERSON: I think it does, Mr. Robinson. I was thinking the same thing myself, if you're about to move on to a new topic.

MR. ROBINSON: I am.

THE CHAIRPERSON: Okay.

Before we break, I would like to talk just a little bit about tomorrow with the participants. So OSEC will start the morning. It will start at 9 a.m. tomorrow to finish your cross-examination.

And I just wanted to confirm what to
expect from the other parties.

So CPAWS, you would be ready to cross
tomorrow? Okay?

I'm assuming that Fort McKay, ACFN, and
Mikisew don't intend to cross Teck, but I just wanted to
kind of check that with the parties.

MS BROOKS: I can confirm on behalf of
Mikisew that's correct.

THE CHAIRPERSON: Okay.

MS LaCASSE: Mr. Chair --

THE CHAIRPERSON: Sorry --

MS LaCASSE: -- we need to get that on
the record.

THE CHAIRPERSON: Yes.

MS LaCASSE: So she's going to have to
come to the podium.

THE CHAIRPERSON: Yeah.

MR. MURPHY: Mr. Chair, I can confirm
on behalf of ACFN that they will not be asking Teck any
questions.

THE CHAIRPERSON: Okay. Thank you.

MS BROOKS: Mr. Chair, it's Karey
Brooks for Mikisew, and I can confirm that we don't have
any questions for Teck.

THE CHAIRPERSON: Okay, thank you.
Is there anybody from Fort McKay? I don't see Ms Razzaghi. So I guess unless I hear otherwise, I'll assume they don't plan to cross, and they can advise if that's not correct. Original Fort McMurray First Nation and Cree [sic] River Band, you'll be ready to cross tomorrow and plan to? Yeah. Can you just come to the mic, yeah. MS GLADIEU-QUINN: Yes, we do intend to cross-examine tomorrow.

THE CHAIRPERSON: Okay, thank you.

MS GLADIEU-QUINN: Thank you.

THE CHAIRPERSON: Smith's Landing First Nation?

MS LaCASSE: Mr. Chair, if the speakers could identify themselves for --

THE CHAIRPERSON: Okay.

MS LaCASSE: -- Madam Court Reporter.

THE CHAIRPERSON: Yeah. Thank you, yeah. State your name and ...

MR. EVANS: Yes, thank you. Maurice Evans with Smith's Landing First Nation. We do not plan to cross-examine.

But I also have a note from the Deninu Kue First Nation from Fort Resolution, downstream from here. And they are requesting that I register them on
their behalf. And they will have a Mr. Marc d'Entremont as a consultant giving evidence next week, Mr. Patrick Simon, counsellor for the Deninu Kue First Nation, and Elder Henry McKay.

So just wanted to register them, if that could be done, sir.

THE CHAIRPERSON: Yes, that can be done.

Do you know, they don't plan to be here tomorrow and they don't plan to cross --

MR. EVANS: No, that's correct.

THE CHAIRPERSON: -- as far as you know?

MR. EVANS: They'll be giving their presentation on October 3rd, I believe it is.

THE CHAIRPERSON: Okay.

MR. EVANS: Thank you.

THE CHAIRPERSON: Thank you.

Northwest Territory Métis Nation? Is there anybody here? Okay, I guess there's nobody there. I thought somebody was coming up.

The Katl'odeeche First Nation. Anybody from that First Nation?

MR. T'SELEIE: Yes, it's Daniel T'seleie, counsel for Katl'odeeche First Nation, and we
intend to cross-examine Teck.

THE CHAIRPERSON: Okay.

MR. T'SELEIE: Thank you.

THE CHAIRPERSON: Thank you.

Keepers of the Athabasca?

MS ASTERISK: Hello, yes, it's Jule Asterisk for Keepers of the Athabasca, and we also intend to cross-examine.

THE CHAIRPERSON: Okay. Thank you.

MS ASTERISK: Thank you.

THE CHAIRPERSON: Government of Canada?

MR. ELFORD: Thank you. Good day, yes, we will also be cross-examining Teck.

THE CHAIRPERSON: Okay, and just your name for the record.

MR. ELFORD: My name is Elford, first initial J.

THE CHAIRPERSON: Okay, thank you.

I believe that's all the parties that had rights to cross-examination. Have I missed anybody?

Okay. Thank you. That was helpful for me.

So we will start at 9:00 tomorrow morning. And we're adjourned for this evening, so have a good evening.
--- Whereupon the hearing adjourned at 1656, to resume on Wednesday, September 26, 2018 at 0900 /
L'audience est ajournée à 1656, pour reprendre le mercredi 26 septembre 2018 à 0900

CERTIFICATION

WE HEREBY CERTIFY that the foregoing has been reported and transcribed to the best of our skill and ability

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Monique Mahoney               Jackie Clark

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