COMMISSION OF INQUIRY
RESPECTING THE MUSKRAT FALLS PROJECT

Transcript | Phase 1 Volume 15

Commissioner: Honourable Justice Richard LeBlanc

Thursday 11 October 2018

CLERK (Mulrooney): This Commission of Inquiry is now open.

The Honourable Justice Richard LeBlanc presiding as Commissioner.

Please be seated.

THE COMMISSIONER: Good morning.

MS. E. BEST: Good morning, Commissioner.

If I may, I have a really brief preliminary note to make.

THE COMMISSIONER: Okay.

MS. E. BEST: Just picking up where we left off yesterday, I just wanted to advise the Commission that we did – we were able to locate some documents last night with respect to my statement and I think, what will be Kathy Dunderdale's evidence, that the government at the time did encourage oil and gas companies to develop our natural gas reserves, and I can give those to Commission counsel and hopefully then we'll be able to pick up on that thread and find some more documents.

THE COMMISSIONER: Right. What we could do is, Commission – just provide them to Commission counsel. I'm assuming they're amongst the documents that we have – the Commission has?

MS. E. BEST: I have no way of knowing that, but I can provide them and perhaps they'll be able to tell.

THE COMMISSIONER: Okay, so where did you get these from, not from our – not from –

MS. E. BEST: Well, I'm not able to access the three million documents –

THE COMMISSIONER: No, but you –

MS. E. BEST: – so I just googled Dunderdale and natural gas and –

THE COMMISSIONER: Okay.

MS. E. BEST: – these came up.

THE COMMISSIONER: So just provide that to counsel and they can – Commission counsel – they'll review it and we'll find a way to get it in at some point in time.

MS. E. BEST: Thank you.

THE COMMISSIONER: Okay, thank you.

All right, Mr. Learmonth.

MR. LEARMONTH: Thank you.

The first witness today will be Roberta (inaudible).

UNIDENTIFIED MALE SPEAKER: (Inaudible) your mic.

MR. LEARMONTH: The first witness today will be Roberta Benefiel, who is in the witness box. Before we ask Roberta Benefiel to testify I ask that Exhibits P-00352, P-00373 and P-00434 through P-00450 be entered into evidence.

THE COMMISSIONER: Okay.

So, it's P-00352, P-00373, and then –

MR. LEARMONTH: P-00434 to P-00450.

THE COMMISSIONER: All right.

Those will be entered as marked; and does Ms. Benefiel wish to be sworn or affirmed, or –

MR. LEARMONTH: Affirmed.

THE COMMISSIONER: Affirmed.

Okay.

I'd just ask you to stand please, if you would.

CLERK: Do you solemnly affirm that the evidence you shall give to this inquiry shall be the truth, the whole truth and nothing but the truth?

MS. BENEFIEL: I do.

CLERK: State your full name for the record, please.

MS. BENEFIEL: Roberta Benefiel.

CLERK: Thank you.

THE COMMISSIONER: You can be seated.

Mr. Learmonth.

MR. LEARMONTH: Ms. Benefiel, I understand that you've lived in Labrador for many years. I'd like you to tell us a little about your background and provide us with a summary of the years you've spent in Labrador.

MS. BENEFIEL: Well, I was actually born in a little place called Little Catalina in Trinity Bay, but my father went to work up in Labrador – before I was born, actually. And when I was about eight, nine months old my mom took me up to Labrador and I lived there until I was finished school. And so, 19 – 18, 19 years and then came to Newfoundland and went to the college. It used to be called the trades college back then. And, went from there on to Toronto and then down to the US and spent about 30 years away from Labrador.

I came back to Labrador in 1989 and – I didn't intend to stay; but I hadn't been able to come back but one time during that whole 30 years. And I just kept staying and I found some painting contracts and I thought, okay, I'll stay as long as I can. Well, that was 1989.

So, you know, the times were really rough when I came back in 1978 for that one time. The Americans had just left the base and it was a pretty devastated place, and I was quite concerned about it even as a young person then. But, when I got back in 1989 I began to see, you know, what's – what hasn't happened in Labrador for so many years.

MR. LEARMONTH: So, your profession, you work as – you have worked in the past as a –

MS. BENEFIEL: Painter, plasterer –

MR. LEARMONTH: Painter, plasterer.

MS. BENEFIEL: – decorator and also bookkeeper.

MR. LEARMONTH: In Goose Bay, Labrador.

MS. BENEFIEL: Painting and plastering in Goose Bay, yes.

MR. LEARMONTH: Thank you.

Now, your – the documentation that you've provided, which is in the – we filed as exhibits, indicates that you're representing two groups: Grand Riverkeeper Labrador Inc. and Labrador Land Protectors Inc. Am I correct in saying that?

MS. BENEFIEL: That's correct.

MR. LEARMONTH: Could you give us a brief history of the Grand Riverkeeper Labrador Inc. and your involvement in that group since it was formed?

MS. BENEFIEL: Well, about 1995 – I was quite a late bloomer, so my friend Clarice and I –

MR. LEARMONTH: Clarice?

MS. BENEFIEL: Clarice Blake Rudkowski.

MR. LEARMONTH: Yes.

MS. BENEFIEL: She used to be the president of Grand Riverkeeper. We decided we'd go to university as mature – very mature students, and during my university courses I took an environmental economics class and Clarice was doing fine arts and Clarice was very concerned about the development of the Lower Churchill, because her father was a trapper and had been a trapper on the river for years.

And so we got together in one of my presentations – she had done some posters and obviously I was doing environmental economics – so we did a presentation together, about the Lower Churchill. And at that time, you know, to me the river was just there. It was – had been there for eons and it was part of our life. We played along the banks of the river and – but it started to become an issue. It started to actually become a symbol of all of the other things that I saw that were not looked after; like, no road out of Labrador.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: You know, different services that we didn't have, and health services and that kind of things.

MR. LEARMONTH: Okay. But the – so the Grand Riverkeeper Labrador Inc. was formed in what year approximately?

MS. BENEFIEL: Mmm. Okay, so to carry on with that story, we got back from university, both of us, and we got together with some folks who had already formed a little group that they called the Friends of Grand River. That little group was small – volunteer of course, volunteer – and then a couple of Innu people joined us and we called it Grand Riverkeeper, Mista-shipu – or Friends of Grand River, Mista-shipu, which is the word for Grand River.

Clarice and I did another presentation at the – it was then called the Labrador Metis Nation – AGM about, you know, we wanted to get people to start understanding what these huge hydro projects were about. We were learning and we wanted to share as much as we could so we did a presentation at that AGM, and at that AGM there was a young fellow, Daniel LeBlanc who was the first Canadian Waterkeeper. He was the Petitcodiac Riverkeeper. And after the presentation, he came to us in the hallway and he said you folks would make a great Riverkeeper group, so we think you should – I think you should apply.

So that was in February 2005. In May 2005, we had presented our application to the Waterkeeper Alliance in New York, and we went down for their AGM and they approved our application. So then we incorporated federally as Grand Riverkeeper Labrador. And we say Grand Riverkeeper Labrador because there's another Grand River in Oklahoma, so we have to say – we had to call ourselves Grand Riverkeeper Labrador so the whole thing came out so we didn't get confused at Waterkeeper Alliance. So that's how we got involved as an incorporated entity.

MR. LEARMONTH: So that was in 2005?

MS. BENEFIEL: 2005, yes.

MR. LEARMONTH: Okay.

So that's the Grand Riverkeeper Labrador, now what about the Labrador Land Protectors, because this document that you filed – is Exhibit P-00352 – is filed on behalf of –

MS. BENEFIEL: Right.

MR. LEARMONTH: – the Labrador Land Protectors as well. Could you tell us when the Labrador Land Protectors were formed and the connection that Labrador Land Protectors has with Grand Riverkeeper Labrador Inc?

MS. BENEFIEL: Well, our members of the groups are a lot of the same people. The Land Protectors were actually named – I think maybe Denise Cole coined the name when, in 2016, there was a lot of activity about the methylmercury issue over near the worksite – the Muskrat Falls worksite, and I think Justin Brake, the editor of *The Independent* magazine, coined that phrase as well.

So somewhere along the way in about 2016, people started calling these people Labrador Land Protectors. So we're Labrador Land Protectors and we're Riverkeepers, some are –

MR. LEARMONTH: Okay.

MS. BENEFIEL: – one or the other but most are both, so …

MR. LEARMONTH: So this is a joint presentation of both groups, so –

MS. BENEFIEL: It is.

MR. LEARMONTH: – am I safe in assuming that any reference to the – to every – any reference in the paper, which I'll call it, prior to 2016 is a reference to the Labrador –?

MS. BENEFIEL: Grand Riverkeepers.

MR. LEARMONTH: – Grand Riverkeepers, not the –?

MS. BENEFIEL: Exactly.

MR. LEARMONTH: And anything after 2016, would apply to both groups?

MS. BENEFIEL: Exactly.

MR. LEARMONTH: Okay, thank you.

And, Ms. Benefiel, are you authorized to speak here today on behalf of both of these groups?

MS. BENEFIEL: Yes, I am. I'm actually on the standing committee of the Labrador Land Protectors as well.

MR. LEARMONTH: So you're a member of both –

MS. BENEFIEL: Yes.

MR. LEARMONTH: – organizations?

MS. BENEFIEL: Yes.

MR. LEARMONTH: Thank you.

Madam Clerk, would you please bring up Exhibit P-00352, and Ms. Benefiel that's tab 1 in your – in the documents that are before you. You can just turn to page – well, page 3 is first – that's the title and it's dated October 1, 2008. Please turn to page 5, Ms. Benefiel.

Can you advise why this paper was prepared and who prepared it?

MS. BENEFIEL: It was prepared because of a request from the Commission to prepare a paper discussing our involvement with the Muskrat Falls Project up to sanction. And the preparation was done by various of us. People submitted things to me and I incorporated, but the typing and the pulling together was actually done by myself, mostly.

MR. LEARMONTH: And you reviewed it before it was –

MS. BENEFIEL: Yes, I did.

MR. LEARMONTH: – sent to the Commission?

MS. BENEFIEL: Yes, I did.

MR. LEARMONTH: And can we then accept Exhibit P-00352 as a true and correct statement of the positions of the two groups that you represent?

MS. BENEFIEL: Yes.

MR. LEARMONTH: I just want you to know, Ms. Benefiel, that Exhibit P-00352 with more than 40 attachments, exhibits, has been filed in its entirety as an exhibit and forms part of the official record of the Commission of Inquiry.

MS. BENEFIEL: Okay.

MR. LEARMONTH: So, if you – we don't – we probably won't be referring to every page of your – of this paper, but you can be assured that it is in the official records of the Commission.

MS. BENEFIEL: Thank you.

MR. LEARMONTH: I'd like you to – I'm going to ask you today to provide a summary of the involvement of both groups on the issues related to the environmental issues related to the Muskrat Falls Project prior to sanction and specifically – are you hearing me, Ms. Benefiel?

MS. BENEFIEL: Fairly well.

MR. LEARMONTH: How can I help? Turn this way? Is that better?

MS. BENEFIEL: Yes, that is better. Thank you.

MR. LEARMONTH: Okay, that's fine. That's what I'll do.

So, generally, what I want you to do today is state the concerns that – environmental concerns that the groups had and were communicated to both Nalcor and the provincial government, and your interpretation or assessment as to how these concerns were addressed by Nalcor or the government. So you had environmental complaints that were communicated to Nalcor and government. I want you to take us – in taking us through the paper, I want you to explain what those concerns were – heading by heading – and then I want you to state your position on how you feel these concerns were addressed. Is that understandable?

MS. BENEFIEL: Yeah, it's understandable –

MR. LEARMONTH: Okay.

MS. BENEFIEL: – there's just quite a lot of it. But –

MR. LEARMONTH: Yeah, we'll work our way through it.

MS. BENEFIEL: Okay.

MR. LEARMONTH: Now, first thing I want to do is turn to page 5 in this – in the summary. And you've – sorry, page 9 in the introduction. Can you just have a look at paragraphs 3, 4, 5 and 6, and then carrying on to page 10, 7, 8, and 9 and 11.

MS. BENEFIEL: I'm sorry, page …?

MR. LEARMONTH: Page 9.

MS. BENEFIEL: Page 9.

MR. LEARMONTH: Yeah, and then page 10, we'll say. These are your introductory comments.

MS. BENEFIEL: And you've said paragraphs – some paragraph numbers?

MR. LEARMONTH: 9 and 10.

THE COMMISSIONER: I think the numbering may be –

MS. BENEFIEL: Yeah, the numbering –

THE COMMISSIONER: – a little off. I think it's actually pages 7 and 8 in the actual exhibit.

MR. LEARMONTH: In mine it's page 9 – the introduction is page 9 and 10.

THE COMMISSIONER: It's on 7 and 8 in this one.

MS. BENEFIEL: It's 7 and 8.

MR. LEARMONTH: Okay, well mine's wrong then.

THE COMMISSIONER: Okay.

MR. LEARMONTH: Maybe I can have another – yeah, mine's definitely 9 and 10. Let's see – oh yeah. Yeah, there is a numbering variance here, we'll call it.

Can you please look at the exhibit, is it on – do you see the introduction?

MS. BENEFIEL: Page 7 and 8 in mine.

MR. LEARMONTH: In yours it is –

MS. BENEFIEL: Yes.

MR. LEARMONTH: – page 7 too – okay.

Could you take us through this and give a summary of the introductory comments that you've made on page 7 and 8.

MS. BENEFIEL: Well, I did find an excellent quote that I'd like to read and that Grand Riverkeeper and Land Protectors believe should have happened with this project. This was – apparently there was legislation in Australia where community groups could have standing in a way that they could – if they saw that projects were not going forward the way they should be, they could actually sue and the government would pay attention to what they had to say.

A new government came in and they intended to change that legislation, and an environmental justice group in Australia went to bat for the citizens and this is a quote from what they said: "Review of governmental decisions is a fundamental safeguard against government – specifically the Executive arm of government – acting beyond its power (that is to say, unlawfully) or making poor or unaccountable decisions. The first control on government power is commonly associated with judicial review, or review of errors of law."

And I want to say that judicial review in this case is what Grand Riverkeeper and Labrador Land Protectors –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – advocated for, for years –

MR. LEARMONTH: Okay.

MS. BENEFIEL: – actually.

The most immediate – wait now – "At the most immediate practical level, wide standing provisions lead to greater environmental protection as community organisations can contribute to ensuring environmental laws are upheld and correctly implemented. Without such standing, unlawful actions which impact adversely on the environment could go undisputed." And –

MR. LEARMONTH: So that was your – you put that in there because that's the sort of principles that you –

MS. BENEFIEL: Yes.

MR. LEARMONTH: – follow.

MS. BENEFIEL: That is actually how we see this. I'm also a member of the –

MR. LEARMONTH: Mm-hmm.

MS. BENEFIEL: – environmental assessment caucus of the Canadian Environmental Assessment group [sp Agency], and one of the things that we've been working on for about 12 years is the environmental assessment problems federally, and of course, federally changed environmental assessments –

MR. LEARMONTH: Right.

MS. BENEFIEL: – would change provincially as well.

So you know, one of the things that I've advocated for throughout that group is that ministerial discretion is too political and that we shouldn't have that many discretionary rules in the Environmental Assessment Act, because that way proponents and political reasons call the day rather than the environmental issues, and after all, it is an Environmental Assessment Act.

The new *Impact Assessment Act* that's being discussed right now has even more ministerial discretion, so Grand Riverkeeper and most of our group on the caucus are very worried about that.

MR. LEARMONTH: Okay, perhaps you could turn to, in your introductory comments, to paragraphs 9 and 11, and could you just perhaps read those, paragraph 9 and paragraph 11, into the record?

MS. BENEFIEL: Okay.

So "despite our sincere, good faith engagement at every step throughout the sanctioning process, the
Project was approved in the face of credible evidence of the significant harm the Project would inflict on the Grand River and its" – environment. "At this point in the process, unfortunately, our hope has been replaced by despair, anger" – and – "frustration, loss of trust in our local, provincial and federal politicians, and a complete loss of trust in the environmental assessment process that we all worked so hard to understand and participate in."

MR. LEARMONTH: And then if you could just read into the record paragraph 11?

MS. BENEFIEL: "In our view, provincial and federal politicians have sacrificed sustainability of the province's natural capital in exchange for short-term political gains" – and short-term jobs – and I just added that – "and economic gains for the province that may in fact never be realized. When the Project is completed, the waters of Grand" – Riverkeeper – "will be contaminated with methyl mercury" – trapping – "traditional trapping and portage routes will be submerged, winter travel will be more perilous, the people downstream will live in fear of the failure of the North Spur and the fish, water fowl" – sea – "mammals and fauna that relied on the Grand River will be displaced, depleted or extinct; what will be left for Labradorians?"

I would like to make a statement that – it's difficult for people who don't live in Labrador to understand how we feel. And I would like to make an analogy to how people feel in Newfoundland about how Quebec actually has taken over the Upper Churchill River and how people here feel against Quebec that they've been, you know, harmed by Quebec's actions.

Well, if you look at that in your heart, and you understand how you feel about that, that is how Labradorians feel about the Lower Churchill Project and, actually, the Upper Churchill, but right now, we're looking at Muskrat Falls and

the Lower Churchill. And that is how we feel, that it's been taken from us.

That river is a symbol of everything else that has happened to Labrador, and it's how we feel about being owned. I just want to make that statement, because that's exactly how we feel.

MR. LEARMONTH: So these statements are spoken from the heart are they?

MS. BENEFIEL: Mm-hmm. Absolutely.

MR. LEARMONTH: And you believe they reflect the views of not only your members but –

MS. BENEFIEL: Absolutely.

MR. LEARMONTH: – other people in Labrador?

MS. BENEFIEL: Absolutely.

MR. LEARMONTH: Okay. Thank you very much.

Perhaps now we can turn to – it'll be page 19 of your paper, Ms. Benefiel. It's "PART II – Environmental Impact Statement Process."

MS. BENEFIEL: Okay.

MR. LEARMONTH: Do you see that? Yeah.

Could you just take us through this Part II and provide a summary of the involvement of Labrador – Grand Riverkeeper Labrador Inc. in the environmental impact statement process as you describe it in Part II of your paper, starting on page 19.

MS. BENEFIEL: Pardon me?

MR. LEARMONTH: Starting on page 19.

MS. BENEFIEL: Yes, so –

MR. LEARMONTH: Just take us through –

MS. BENEFIEL: – under "Environmental Impact Statement –

MR. LEARMONTH: Yes.

MS. BENEFIEL: – Process."

MR. LEARMONTH: I would like a summary of your group's participation in that process.

MS. BENEFIEL: Right.

So January 15, 2007, when the project was apparently announced in earnest, we wrote a letter to the Minister of Environment and Conservation, Clyde Jackman. And we didn't understand how you get involved in this process, but we requested to be stakeholders in the environmental assessment process.

Then in June 5, the federal minister of the environment announced that it was going to be a joint panel process and so applied – when the guidelines, information came out we applied to – for some money to look at the guidelines for the – how the environmental impact statement was to be put together.

Okay, let's see. We hired a couple of experts, actually, and had them come up – with the $13,000 that we were given, we hired a couple of experts, and we had them come up to Goose Bay, and we went – it was in January; we went to Northwest River and had a meeting down there. We went to Mud Lake on snow machine in minus 40 degrees, and we had a meeting in Mud Lake, and we had a meeting in Goose Bay. And people told us what their issues were, what their concerns were about the project, and we incorporated that in our request for – or in our comments on the guidelines.

MR. LEARMONTH: So the objective at this stage was to gather information so that you would be able to understand what the concerns are of the people, Labrador – or those people you –

MS. BENEFIEL: Exactly.

MR. LEARMONTH: – interviewed, anyway?

MS. BENEFIEL: Exactly.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: I see on page 20, too, that – 20, not 22. 20 also – we set up an office with some of that money, staffed with a SWASP

student. And a call went out for people who couldn't operate computers if they wanted to come in and talk to the student, and the student would write up their concerns, and we did that, and we submitted quite a few comments that way.

All of those are on the CD for the environmental assessment process. And I believe you've been provided with one of those.

MR. LEARMONTH: Yes, I believe we have, yup.

MS. BENEFIEL: Yes.

MR. LEARMONTH: So then just turning to paragraph 66, "GRK's impact on the EIS Guidelines." Could you –

MS. BENEFIEL: Yes. That is one area where we found that – we believe we were listened to. Eldred Davis, who was treasurer are the time, raised concerns about seismic hazards in respect to the project or earthquake hazards. He talked about a – the fault line that runs along the north and south sides of the river, and asked could that be looked at.

And Natural Resources Canada actually came out with their topic on seismic hazards and earthquakes and faults and they modified their document to read: "Regional seismicity (natural and reservoir induced) and documentation of the relevant geological structures …." That was added as part of their review. They made changes to the guidelines based on our recommendations. Probably based on others as well –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – but we found that they did – they even quoted Eldred, Mr. Davis, in their changes. So we felt that at least, NRCan looked at that particular issue and agreed with what we had said, so.

MR. LEARMONTH: So that issue was resolved to your satisfaction?

MS. BENEFIEL: Yes.

MR. LEARMONTH: Okay.

MS. BENEFIEL: Yes. There was actually a study done on –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – earthquakes, and that – however, you know, with every kind of geological issue, you can't always predict what mother earth is going to do, and we –

MR. LEARMONTH: Right.

MS. BENEFIEL: – note that on the Saguenay River, there was a – I think it was the Sainte Marguerite dam. When that reservoir was filled, they did have a small earthquake. So that's our concern – is that some of those fault lines could have an impact –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – on the reservoir when it's being filled, and then obviously on the dams. So even though there's been good studies done, nobody can really predict –

MR. LEARMONTH: Yes.

MS. BENEFIEL: – what might happen. And we're 36 kilometres downstream.

MR. LEARMONTH: Yes.

Now on paragraph 70, under the heading: "GRK Feedback on [In]adequacy of EIS," you list a number of issues – some environmental, some not really environmental. I'd like you take us through these concerns, and take out – we don't need to hear evidence on issues that are not environmental. Just take us through these issues and describe the concerns that you had with respect to them.

MS. BENEFIEL: Well, for instance: "Disputing the notion that Hydro is "Green Energy" and questioning whether alternatives … were duly considered and inadequacy of the information relating to …" them.

On the green energy situation, you know – because we were concerned, we did as much review of every document we could find. And in fact, while I was in university, I purchased – out

of a university salary, which was nothing, basically – a document produced by the World Bank called Dams and Development. And if you could see that document right now, with the tabs on it and the pages –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – falling out of it, you'd understand that we really pored through that document to learn what the issues with hydro projects were – and this was not green energy.

In fact the former Premier Danny Williams came to Labrador and at one point after his talk –

MR. LEARMONTH: When was this?

MS. BENEFIEL: This was before the project was actually sanctioned – I can't remember the date – it was quite a bit before that. Anyway, it was in the minds of everybody – it may have already been sanctioned – No. It was not sanctioned, I know that.

So at that point I went up to Mr. Williams after the process, and – or after the presentation – and I said: please, Mr. Williams, for all these reasons, stop calling this project green. And he looked at me and his only words to me were: point taken. And I knew and we knew – you know, Eldred Davis was there, Jim Learning was there, two or three more of our members were there – and we talked about it later and we said, this is a David and Goliath situation. We have to do battle and we have to learn as much as we can because this is a foregone conclusion. That was our feeling.

MR. LEARMONTH: That was your feeling, anyway, yeah.

MS. BENEFIEL: Yes.

MR. LEARMONTH: Okay, so that was a concern you had about the description of the project –

MS. BENEFIEL: Right –

MR. LEARMONTH: (Inaudible.)

MS. BENEFIEL: – and then the Red Wine caribou herd –

MR. LEARMONTH: Okay.

MS. BENEFIEL: We expressed a lot of concern about that and of course, in the EIS, Nalcor said that, you know, their project would not affect the Red Wine caribou herd. In fact, throughout the EIS nearly every single environmental impact was considered not significant; and this is a 93,000 square kilometre watershed.

It's the largest river in Atlantic Canada, it's the seventh largest in Canada, and damming it is not, not significant. We knew that intuitively, so we, you know – the Red Wine caribou herd was near extinction. They finally – I think the Joint Panel had them do some review – not review, but monitoring of the herd– and it went from, like, 80 animals, and I think in 2017, now it's down to 20.

So we didn't believe that the effects of this project would be not significant to the Red Wine herd. And it is significant, and they've dropped by 20 – for other reasons, too, but I think this project had a lot to do with that as well.

On the cumulative effects, we advocated for – through the environmental assessment caucus that I belong to in Ottawa – Bruno Marcocchio and I – the Sierra Club guy – we spoke to one of the members of the environmental assessment – no, of the Canadian Environmental Assessment Agency – and we said, how can you assess the generation project without assessing the transmission line? So, cumulative effects, of course, were ignored. The effects of the transmission line on forests, and on whatever wildlife, were ignored because they did not assess them together.

And we couldn't understand how you could build a generation project in the middle of Labrador, with no place to bring the power without the transmission line, and yet they separated – and the Environmental Assessment Act states that these things need to be assessed together. So that didn't get done.

Under the reservoirs and flooding – okay, we did ask – we had a GIS fellow looking at the flooded area, and we asked Nalcor for information on how they came up with the area – total area that would be flooded. And – because we wanted to

recreate for ourselves what area would be flooded. We had maps from Nalcor – or, I guess, Hatch, or whoever produced those maps. And we wanted that information so that our GIS person could reproduce it, and we could never get it.

On public participation, there were show and tell meetings where Nalcor officials came in with a whole bunch of beautiful photos of how everything was gonna look so nice and we were able to ask questions, but we never felt that our information was taken seriously – our concerns were taken seriously, ever.

We raised the concerns about unsafe winter travel, especially from Mud Lake. Mud Lake uses that river crossing in the winter to get back and forth to work. Mud Lake residents do not have a road and they don't want one. They like it that way. And I don't think they should be forced to have one, but that is apparently what – the only way they're going to be safe is to do that.

On the forest classification we said, you know, this forest is in this river valley. We've paddled this river valley several times and we knew that the trees along the river valley were huge. I couldn't put my arms around some of them. That doesn't happen on the height of land in Labrador.

When you go further north and get above the valley of the river, those trees are small, quite small. And so we said that's a pristine forest, how can you destroy that? And the Department of Forestry said, well, the whole of Labrador is considered pristine in that effect, you know, old growth. It's all over 100 years old. But that's not the point. It's that these trees were going to be cut and laid down and we thought and advocated for the forestry department to ensure that a method was in place for people to use those trees before the project started.

We had a fledgling forestry business in Labrador, small businesses. We wanted to see those trees used, at the very least for local people, and we – some of our members are – actually, all of our members belong to a little monitoring group called the Third Signatory, and we said, you know, you can't cut all this forest and just not have some way to use it; because it was going to be over a million cubic metres cut with Gull Island and Muskrat Falls. There's over 530 cubic metres cut with Muskrat Falls, and that's like twice the yearly annual allowable cut. So we thought they have to do something with that, but the trees are sitting there right now rotting.

We talked about it just before I left. I said, Jim, we need to go get some of those trees that Nalcor has laid down alongside the road. And we went up to take a look at them and they're full of sand, and they're so rotted in the centre they're useless for even firewood.

So all of those trees – and we've got coastal communities burning diesel and they all have woodstoves, and none of it's ever been sent anywhere to be used. So, you know, that's another issue with this project. Millions and millions and millions of trees just laying there rotting. Some will be flooded and, you know, down the transmission line. The same thing down here, from what I understand. Coming down through the Great Northern Peninsula there are trees laid everywhere.

Okay. So I mentioned Mud Lake and the possibility of a flood. Any time you have three dams 36 kilometres from any community, you better be sure that you've done everything you can possibly do to ensure those people are safe. And, you know, everyone here probably knows what happened last year when Nalcor let water out. Mud Lake had six feet of water in their homes, and we said, you know, there's no – the preparedness plans are made. Nalcor has an emergency preparedness plan.

The Town of Happy Valley-Goose Bay I understand has finally gotten one together. They kept saying to Nalcor that Nalcor needed to provide capacity for them to put together a plan and to put together an evacuation plan. Because the lower part of the valley, if one of those dams was to fail, would be under water. And, in fact, did go under water even with the small amount of water that was in the reservoir last year. And, of course, Mud Lake would go under water.

But I spoke with a couple of people from Mud Lake a week or two before I left to come down here, and yeah, they do have an emergency preparedness plan – or Nalcor does – but there's

no evacuation plan. And one of the members of the community said there's no way to evacuate us.

In the case of a catastrophic failure, if the dam fails fast – which it could do – we can't get out of here. At certain times of the year, right? If it's break up or freeze up, they're not – they can't get them out by helicopter, there's just not enough time. It would be like an hour-and-a-half, and people would be under water.

So that was a really big concern, and we've pushed for that, pushed for that. We've gone to meetings with the town council of Happy Valley-Goose Bay, we've talked to Nalcor, we've talked to government officials, we've sent letters – you know. And as far as I know, still no evacuation plan for Mud Lake, so.

MR. LEARMONTH: Okay.

MS. BENEFIEL: So on the inadequate fish habitat creation and compensation, a Mr. Ryan – I think he was a DFO officer. I think there's probably a document somewhere that we provided – who said that for every hectare of river habitat that's destroyed, in order to provide enough habitat for salmonid habitat there needs to be 42.857 hectares of lake habitat created.

So we put that to Nalcor and we said, you know, how much habitat are you going to create? And we wanted an independent review of the HADD compensation plan and then assurance that these figures would be used when river habitat had to be created. However, we've not been notified whether that recommendation was ever taken into account.

We did have some closed, invited only, meetings about habitat creation and we were told at those meetings that, by the Department of Fisheries, that Nalcor would be asked – not asked, told that they had to provide an irrevocable letter of credit to cover what the Department of Fisheries and Oceans decided was the amount in case their habitat plan didn't – recreation plan didn't work. And we have tried on several occasions over the last three, four years to get a copy of that.

We finally got a letter a few days ago stating that the document was in the hands of DFO through a Access to Information but that it had to go to Nalcor to be vetted or redacted, wherever – however they felt. So we still don't have a copy of it.

MR. LEARMONTH: So this concern – you mentioned a recent letter, but this concern was expressed to the government, provincial government and Nalcor before sanction?

MS. BENEFIEL: Oh yes.

MR. LEARMONTH: Yeah. Okay.

MS. BENEFIEL: Oh yes, many times.

MR. LEARMONTH: Okay.

Thank you.

MS. BENEFIEL: The downstream effects of the project; I mean, when Nalcor said there would be no effects of the project beyond the mouth of the river, I think I was a bit snotty. I think I – in the hearings, I even looked up at Gilbert Bennett and said: what are you going to do, put a sign out at the –

MR. LEARMONTH: What hearings were these?

MS. BENEFIEL: The hearings for the JRP (inaudible).

MR. LEARMONTH: Okay. We'll deal with that later.

MS. BENEFIEL: Oh, okay. Sorry.

MR. LEARMONTH: We'll deal with that. That's the next thing –

MS. BENEFIEL: Anyway, downstream effects was one thing that we really, really wanted included. For reasons of water quality, for reasons of methylmercury and, you know, whatever other reasons – salination and nutrients and that whole body of information for us.

MR. LEARMONTH: So you say – and this is on page 21, the last item. "Downstream effects of the project: GRK disputed the proponent's assertion that the Project would have no impacts beyond the mouth of the river and advocated for the inclusion of these impacts in the analysis."

MS. BENEFIEL: Absolutely.

MR. LEARMONTH: So just summarize what exactly you mean by that.

MS. BENEFIEL: Exactly.

MR. LEARMONTH: Yeah. You just summarized that have you?

MS. BENEFIEL: Yes.

MR. LEARMONTH: Okay, thank you.

Okay, the next topic I want you to cover is the Joint Review Panel assessment process, and if you can turn to page 22 –

MS. BENEFIEL: Okay.

MR. LEARMONTH: – of your paper. Starting with – well, there's a heading: GRK involvement in the Joint Review Panel Assessment Process. And then you start in paragraph 71.

Now, before we get there, did – what steps did your group take to become involved in the – in this Joint Review Panel assessment process?

MS. BENEFIEL: Well, we actually applied for funding and we were one of a few groups who got funding; we received $64,000. Which we thought was fantastic but once we started trying to hire consultants and trying to do the work with that money we found that it was, you know, it was pretty meagre for the work that needed to be done. But actually the Joint Panel themselves commented at the end of our closing arguments that they were amazed at how much work we'd gotten done out of – with very little finances. So –

MR. LEARMONTH: So you stretched the $64,000 –

MS. BENEFIEL: Oh, we stretched it –

MR. LEARMONTH: – as far as you could. Yeah.

MS. BENEFIEL: – as far as we could stretch it.

MR. LEARMONTH: Right, yeah.

MS. BENEFIEL: We actually had a lot of submissions from concerned scientists like: Dr. David Rosenberg; Dr. Gordon Hartman; Stu Luttich, who was a former wildlife officer in Labrador for many, many years; Dr. Brenda Beck. I – like, I'm probably missing some, but those people actually did work for free.

I remember Dr. Rosenberg telling the panel at the end of his presentation: You know, I'm doing this for my grandchildren. And actually, I guess, most of us who are the old folks on the Grand Riverkeeper board are doing it for the very same reason. Like, Mr. Vardy said yesterday, we'll be dead and gone before the effects of all of this are felt. So we do this for your grandchildren, for our grandchildren.

MR. LEARMONTH: Okay.

MS. BENEFIEL: And I thought it was pretty cool that so many of the people we contacted agreed to do work for us, for free –

MR. LEARMONTH: Okay.

MS. BENEFIEL: – or for very little.

MR. LEARMONTH: Yes.

Now, so you received funding for the Joint Review Panel assessment process, and did you participate in the hearings?

MS. BENEFIEL: Oh, yes. We certainly did. All of us did. We had presentations from, probably, 15 or 20 of our members.

MR. LEARMONTH: Okay.

And were the concerns that you expressed – or did the concerns that you expressed before the Joint Review Panel include the concerns that we just went over on page 21?

MS. BENEFIEL: Absolutely.

MR. LEARMONTH: So they were all –

MS. BENEFIEL: Most of them.

MR. LEARMONTH: Most of them?

MS. BENEFIEL: Yes. Yes.

MR. LEARMONTH: Yeah. And were there –

MS. BENEFIEL: And more.

MR. LEARMONTH: And more. Okay.

Well, can you explain what additional concerns you conveyed or expressed to the Joint Review Panel? Take your time to go through the document before you answer. I think methylmercury was one.

MS. BENEFIEL: Oh, absolutely. That one was really –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – that was really a heavy-duty one.

MR. LEARMONTH: Okay. Well, just to give us a summary of the methylmercury problem, as you see it. Just a short summary of your understanding of –

MS. BENEFIEL: Yeah, well if you –

MR. LEARMONTH: – why this is a problem.

MS. BENEFIEL: Right.

If you go back to the downstream effects –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – the little section that we mentioned. I mean, the methylmercury is something that, you know, we – we're not biologists or scientists, but we read as much as we could and we realized that methylmercury is an issue for every single mega-hydro project in the world.

And, you know, you can't flood a land and soil that contains mercury and not end up with methylmercury in some amount, depending on how much water is flooded and – or how much land is flooded, I mean. So we did the work and we, you know, we kept saying that there's gonna be methylmercury issues. There's already methylmercury higher – we had a methylmercury workshop with Nalcor, actually, and the whitefish are already – from the Upper Churchill – still two times what the Canada guides are – safe eating guides. So we knew that downstream there were gonna be more methylmercury added to what was already there.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: And then, of course, Nunatsiavut –

MR. LEARMONTH: Yes.

MS. BENEFIEL: – got involved, and –

MR. LEARMONTH: You can just turn to – just to help you, if you turn to page 24 –

MS. BENEFIEL: Mm-hmm.

MR. LEARMONTH: – paragraph 83, there's a reference to the Nunatsiavut Government.

MS. BENEFIEL: What paragraph?

MR. LEARMONTH: Eighty-three.

MS. BENEFIEL: Oh, right. Okay, so –

MR. LEARMONTH: So is that what you were referring to?

MS. BENEFIEL: Right, right.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: So they initiated a study with the help of Memorial University and Harvard University and were able to demonstrate that they had legitimate concerns and that our concerns were legitimate, based on credible scientific evidence.

But the Government of Newfoundland and our MHA continued to ignore the recommendations of the – well, just to add into that, that eventually from activities of Labrador Land Protectors and Riverkeepers, where we actually went on the site and shut the project down for five days, then finally the government had a meeting with the – with Nunatsiavut and the Innu Nation and NunatuKavut, and they came up with the plan to hire an Independent Expert Advisory Committee. Now, it took about eight or nine months to even get, you know, the chair for that but it did happen, and they made

recommendations and as of – I've written two letters and gotten two letters back from Mr. Andrew – my original letter went to Eddie Joyce, and Mr. Andrew Parsons answered and he's answered two letters and said: We're working on it.

So that's since, like, April of this last year, and still the recommendations of how to clear the reservoir, to mitigate methylmercury have not been instigated or I don't know if they ever will be.

MR. LEARMONTH: But you addressed this – you put forward your concerns about –

MS. BENEFIEL: Absolutely.

MR. LEARMONTH: – methylmercury to the Joint Review Panel –

MS. BENEFIEL: Absolutely.

MR. LEARMONTH: – as did others, right?

MS. BENEFIEL: Yes.

MR. LEARMONTH: Okay.

Now, I know, I think, one additional concern that you expressed at the – before the Joint Review was on the North Spur and we'll –

MS. BENEFIEL: Absolutely.

MR. LEARMONTH: – deal with that later as a separate category.

MS. BENEFIEL: Yes. Yes.

MR. LEARMONTH: Okay.

MS. BENEFIEL: Absolutely.

MR. LEARMONTH: You've also – on page 27, paragraph 94, of your Exhibit 00352 – you deal with eelgrass.

MS. BENEFIEL: Right.

MR. LEARMONTH: What – why do you cite this as an example? What is it an example of? What –

MS. BENEFIEL: It's strange, I didn't – none of us realized during the panel hearings, really, that eelgrass was an issue. We didn't see the documentation on it. And then I read something else that tweaked my memory of it. So, you know, we stated the study area should be expanded and include Goose Bay and Lake Melville – again, downstream effects, okay – in order to predict the environmental effects of the project.

In their information request number 43 – the JRP's information request to Nalcor – they requested further information on several issues, including: "The Proponent is asked to provide a more thorough analysis of potential impacts of the main stem and tributaries below Muskrat Falls, the Goose Bay Estuary and Lake Melville including: i. information on the presence of eelgrass beds in the Churchill River estuary and, if there are any, the potential impacts of the Project on this habitat and any proposed mitigation measures."

And Nalcor responded: "Jacques Whitford (2001) conducted a biological survey of Goose Bay and the eastern end of Lake Melville in 1998. Surveys were completed both by boat and helicopter to characterize shoreline habitats and sample sites. No eelgrass beds were recorded in the study area. In addition, no eelgrass beds were documented in the 1999 sampling of Goose Bay Estuary and Terrington Basin surveys completed by AMEC."

Well, when I saw the Terrington Basin surveys, that tweaked me because I live on Terrington Basin and I know there's eelgrass in front of my cabin. And so DFO paper entitled – there's a paper called – that DFO wrote called Does Eelgrass Meet the Criteria as an Ecologically Significant Species? And they said in that paper – and I think I've sent a copy to you folks, and it's in here somewhere.

"In Newfoundland, eelgrass is distributed around the entire island with the greatest abundance on the southwest coast, which has more suitable habitat for eelgrass. Most of the surveys are only sufficient for delimiting presence but not for estimating abundance. It has been identified" – and I underlined this section. "It has been identified as far north as Nain

(Labrador) and is extensively distributed in Lake Melville."

So DFO believed the eelgrass was there but AMEC and Jacques Whitford, Nalcor's scientist, said there was no sign of it. Unless they did their studies in the dead of winter, which they would not see eelgrass, I can't – we don't understand why there's that difference. Is it because –?

MR. LEARMONTH: Well, your –

MS. BENEFIEL: I'm sorry.

MR. LEARMONTH: No, you go ahead, sorry.

MS. BENEFIEL: I think, personally, that it's because it was being considered as an ecologically significant species and that had they found eelgrass, they would've had to dealt with that downstream.

MR. LEARMONTH: But it wasn't dealt with, to your knowledge?

MS. BENEFIEL: Not that I know of.

MR. LEARMONTH: Okay.

MS. BENEFIEL: No.

MR. LEARMONTH: Okay, that's fine.

Now, we're – there may be some repetition between the evidence you'll give here on the points I'm gonna refer you to. But if there is duplication, you can take that into account and not say the same thing –

MS. BENEFIEL: Okay.

MR. LEARMONTH: – that we may have covered it before. So we're going through the Downstream Effects – paragraph 102, page 29.

MS. BENEFIEL: Right.

MR. LEARMONTH: Can you turn that – and you can just take us through those paragraphs under the heading Downstream Effects – if you wish to add anything to what you said earlier about that subject.

MS. BENEFIEL: I'm sorry, what was your question for me?

MR. LEARMONTH: Is there anything more under the heading Downstream Effects in paragraphs 102 and 103 – is there anything you wanted to add to what you earlier said?

MS. BENEFIEL: Well, yes, you know, the LGL report that we reviewed –

MR. LEARMONTH: Okay well just take us through that, please.

MS. BENEFIEL: Yes, so January 17, 2011, LGL was asked to do a report for Nalcor on downstream – or on – wait now – I can't – it seems to me that the panel asked for extra information on this, and that's why the extra report was done.

But in the report it says: The Lower Churchill Hydroelectric Project has been reconfigured to initially focus on the Muskrat Falls development component. As part of its direction from the Joint Review Panel – okay, that's where I got it from – Nalcor energy is required to address downstream effects in more depth than in previous Nalcor submissions. LGL Limited research associates was retained by Nalcor and – underlining – concluded that the aquatic and the aquatic components of the terrestrial assessment area should have include – should include at least Goose Bay and possibly inner Lake Melville of Central Labrador.

This report evaluated a suite of terrestrial issues arising from the EIS, and how they relate to a downstream area encompassed under Ecodistrict 452 of the inner Lake Melville area. This study suggests that a scientific-based focus under an ecosystem-based planning approach is more likely to ensure that sustainable development is achieved. So this is their recommendation to Nalcor.

In addition to an adjustment of the assessment area, the approach proposed in this report presents unique challenges to Nalcor which, in many respects, will require progressive environmental orientation to the design, operation and management of the Lower Churchill Project.

So that would have been a quite extensive change, I think, for Nalcor to have to do. We became aware of that report in March of 2018 when Dr. Goudie published his article on the failure. It was called "On the Failure of Environmental Assessment," and it was published on FANE website – For a New Earth I think is the name of that group – and they had come up to Labrador and done a symposium.

It was not published or provided to any of us. We didn't – we never saw it during the hearings, and as far as I know, the Joint Panel never received a copy of that. But at least it was – in our – we've never seen it – it's never been brought up. Otherwise –

MR. LEARMONTH: So was that concern –

MS. BENEFIEL: – we would have –

MR. LEARMONTH: – addressed or not?

MS. BENEFIEL: Pardon me?

MR. LEARMONTH: Was that concern of yours addressed then by the Joint Review Panel?

MS. BENEFIEL: No, this was –

MR. LEARMONTH: No.

MS. BENEFIEL: This is something that's come – we just found this in March –

MR. LEARMONTH: Oh, right.

MS. BENEFIEL: – of 2018.

MR. LEARMONTH: Okay.

Okay. Now, moving on – on page 30, paragraph 104, dam failure and emergency procedures, I think you've touched on that earlier when you're discussing the situation, as you see it, in Mud Lake. Can you just carry on with your discussion of that?

MS. BENEFIEL: Yeah, so, in paragraph 104, of course, it just simply states that: "… that the substrate in the Project and reservoir area, including the North Spur, is such that a dam failure is a real and significant …." –

MR. LEARMONTH: Yep.

MS. BENEFIEL: There's –

MR. LEARMONTH: We're gonna deal with the North Spur later.

MS. BENEFIEL: With that later, yes.

MR. LEARMONTH: Yep.

MS. BENEFIEL: Okay.

So the bank stability modelling – this is from the federal Department of Fisheries and Oceans. In the course of the JRP hearings, they raise concern that insufficient sampling had been done to make accurate predictions against bank stability. So they say: "Bank stability modeling used input values from literature and estimates instead of measurements from project area. This leads to uncertainty in predictions of duration of elevated suspended sediment and nutrient levels …."

So that's from their presentation to the panel. That's slide 7. On – shall I continue on with the –?

MR. LEARMONTH: Oh, just summarize, yes, as best you –

MS. BENEFIEL: Yep.

MR. LEARMONTH: – can, Ms. Benefiel.

Thank you.

MS. BENEFIEL: Okay.

So regarding the emergency preparedness, the JRP wrote that, you know, they were not convinced that two hours warning of flooding resulting from dam failure would, in all circumstances, be adequate to no loss of life. So they were – they commented, as we felt that, you know, if – and it's not two hours. By the time you go through your emergency preparedness plan, and make the phone calls that have to be made to the various people, that – you lose 10,

15 minutes. And then, you know, within an hour and a half, you've got a body of water coming –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – down towards the lower valley in Mud Lake. So, you know, they agreed with us and various other people who made that statement.

MR. LEARMONTH: And as you said earlier, as far as you know, that that concern has not been properly addressed (inaudible).

MS. BENEFIEL: As far as I know, the mitigation – or the evacuation plan for Mud Lake is not in place.

MR. LEARMONTH: Okay. That's fine.

The next heading I'd ask you to turn to is on page 31, paragraph 111, Methylmercury contamination. Now, you've already covered that by saying that as far as you know – that the concerns have not been addressed. Is there anything else you wish to add to your earlier comments on methylmercury?

MS. BENEFIEL: Maybe I could tell you the reason why methylmercury is so important, and it's –

MR. LEARMONTH: Yes, a brief discussion of that –

MS. BENEFIEL: It – yeah, just –

MR. LEARMONTH: – would be fine if you wish to give it, yeah.

MS. BENEFIEL: You know, the fact that –

MR. LEARMONTH: Your understanding of it, yeah.

MS. BENEFIEL: – fish and seal –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: And by the way, Nalcor kept telling us the seals would not feed up by Muskrat Falls and then during the hearings I spoke with a fella who'd been a fisherman and seal hunter all his life, and is my age, and still, you know, he still eats seal meat, and he still harvests seal meat. And when we read that section, he said to me that's crazy, seals come up there all the time; we've caught seals up there. So this is anecdotal evidence from someone who's actually been on that river and hunted seals at Muskrat Falls.

So our concern was that when the reservoir's flooded and little bits of fish come through these turbines, these seals are gonna have, like, a smorgasbord of food. Of course they're gonna feed there. And then they don't stay in the river, they go back out into Lake Melville.

Well, the communities, the northern communities of Rigolet and Hopedale and those communities come into Lake Melville and Goose Bay every spring to hunt seals.

MR. LEARMONTH: Yes.

MS. BENEFIEL: And the reason why an increase in mercury in the seal flesh is so important is because if you ever stopped into the company store in Rigolet, or the government stores, and looked at the prices of what the meat costs and everything –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: One woman that was a tourist sent me – I kept her dog, and she sent me a picture of the four old hamburgers that were freezer burnt. They had been marked down from 28.95 to 14.50 on sale.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: This is the reason why it is so important that methylmercury be monitored and that something be done to stop or to mitigate how much methylmercury is going to get into the traditional food source.

MR. LEARMONTH: Yeah.

In addition to your helpful comments we've also heard evidence from Carl McLean and Rodd Laing, I'm sure you're familiar with them.

MS. BENEFIEL: Yes, I know them both.

MR. LEARMONTH: They've given a –

MS. BENEFIEL: Good.

MR. LEARMONTH: – detailed explanation, so that will supplement the evidence that you've just given.

MS. BENEFIEL: Good.

MR. LEARMONTH: And thank you for giving that.

MS. BENEFIEL: Yes, I assumed they would.

MR. LEARMONTH: Yes.

Next, please turn to page 35 under the heading, in paragraph 132, "Improbable, Unproven, Imprudent – [Re]creation of habitat." Could you take us through that concern, please?

MS. BENEFIEL: Okay, so on the ecosystem side, one of the experts that we hired was Dr. Murray Rudd and his assistant, Dr. Nejem Raheem. This was during the environmental assessment.

And what they did for us was to start a process talking about valuing ecosystems –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – and valuing ecosystems for these very inherent values that, you know, they provide food and waterways and all of the, you know, all of the things that ecosystems provide. So – and ecosystems don't develop overnight, and they're not developed over a year or two. Ecosystems develop over millennia. I mean, the river, Grand River, has been there for thousands of years.

So Nalcor's plan to recreate wetlands, riparian habitat, fish habitat, recreate it – ashqui. They – you know, we had a section we talked about ashqui. We talked to Dr. Ian Goudie who gave us some information about how that would be formed and why it would not be productive ashqui where waterfowl who migrate could stop and feed. Nalcor told us that new ashqui would form. Well, maybe open water might form, but how many millennia would it take for that open water to actually have the nutrients that those birds need in order to continue their flight path.

So ecosystems can't be created by humans. I don't think Nalcor can create fish habitat that is truly productive. They told us, at the hearings that they had, they were very effective with the Bay d'Espoir project and that they did recreate some habitat and that that worked, but we haven't seen any documentation on that, and it's nowhere near the amount of habitat that they plan to recreate on the Churchill River.

MR. LEARMONTH: So that concern of your group was not properly addressed –

MS. BENEFIEL: No.

MR. LEARMONTH: – in your opinion? No.

MS. BENEFIEL: Well, we don't know yet, because it's something that's got to be done after the project, right? And as of now, at least, we've got three, you know, three requests for access and information for a document that even will give us some assurance that DFO will even make Nalcor pay or put in this irrevocable line of credit –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – that would allow some of this work to be done if it doesn't work and allow some recreation in other places. So we're not confident, absolutely not.

MR. LEARMONTH: Okay.

The next heading I'd ask you to address is on page 38, beginning in paragraph 146, under the heading "Atlantic Salmon." Could you turn to that please, Ms. Benefiel?

MS. BENEFIEL: Sure.

We've been told time and time again that Atlantic salmon don't go up over Muskrat Falls, the falls is too rough for Atlantic salmon to go up. I've been to White Bear Falls in the summer, in the spring, when salmon have jumped White Bear Falls. It's quite a lot higher, steeper than Muskrat Falls, so I know salmon have a way to get back to the rivers that they spawned in. But Nalcor consistently stated that Atlantic salmon

don't go up over the falls so there was no reason to worry about the reservoirs, either the Muskrat or Gull Island, affecting Atlantic salmon.

And it is our opinion – or most of us – that the reason for that is because – well, originally the Atlantic Salmon Federation sent a letter to the panel, or to the Canadian Environmental Assessment Agency, and said we don't agree with this project, because it's going to affect Atlantic salmon. But then that was the last thing we heard from them. They didn't get involved during the hearings, and they just disappeared off the face of the earth.

But we've talked to people who have caught Atlantic salmon, and we've stated that, and we've been told that those people didn't know the difference between a ouananiche and an Atlantic salmon.

So I had a few talks with this fellow Charlie Learning. He said – he's been a fisherman for like 17 years – I know the difference between ouananiche and Atlantic salmon. I spoke with a retired DFO officer who knows Charlie Learning, and he said if Charlie Learning said he caught an Atlantic salmon at the tailrace –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – of the Churchill Falls Project, then he's telling the truth.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: I also talked to another DFO scientist, retired, Sammy Saunders, who said the same thing.

So you know, we don't have a capacity to do – we never had the capacity to do the proper studies, and one of our members, Eldred Davis – you know, he's pretty good with this kind of stuff, and he said, the studies that Nalcor did, they did it at the wrong time of the year, for one thing.

MR. LEARMONTH: Yes.

MS. BENEFIEL: Their sampling on a lot of the fish sampling was too small, and even, I think, either Natural Resources Canada or DFO said the same thing during the hearings. And Eldred said they – you know, all they had to do was hire a couple of locals to go up and put out a net and they would have found salmon. And that's – that was Eldred's opinion.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: So I think that the reason why Atlantic salmon were left out was probably because that would have been a big issue.

MR. LEARMONTH: Okay.

MS. BENEFIEL: People on the east coast of the United States would have had a stroke –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – if Atlantic salmon waterways –

MR. LEARMONTH: Wasn't considered? Yeah.

MS. BENEFIEL: – wasn't considered, and so –

MR. LEARMONTH: So –

MS. BENEFIEL: – it had to be that no Atlantic salmon went up Muskrat Falls.

MR. LEARMONTH: Okay.

So with the reasons that you've just given – that concern of yours was – your group's – was not addressed. Is that –

MS. BENEFIEL: No.

MR. LEARMONTH: Can I conclude that?

MS. BENEFIEL: Not at all.

MR. LEARMONTH: Okay.

The next heading I'd ask you to turn to is on page 39, paragraph 151: "Adaptation of Fish Populations to Changes in Water Quality."

Could you take us through that concern please?

MS. BENEFIEL: Sorry, I have to read it a little bit – it's been a while putting these things together. So …

Okay. So these are – you know, we had the concerns about the water quality and how the – everything would stabilize for fish populations. We read back through the old 1980 environmental assessment, and you know, DFO, back then, said that the fish assemblages would change to more than likely a pike and sucker dominated community.

And so we thought that understanding from Nalcor was that there wouldn't be much change in the fish populations upstream and that we should – that's one of our big issues, so …

Okay, so the panel then summarized that participants – some of us, all of us, who mentioned this issue – "that Nalcor's predicted change to fish habitats showed up to and" – about – "90 percent loss in available habitat after inundation for a number of species." And remember that this – I believe this was the Gull Island and Muskrat Falls –

MR. LEARMONTH: Yes.

MS. BENEFIEL: – Project. Okay? So they talked about pike, burbot, ouananiche, sucker, stickleback – no – nothing in there about Atlantic salmon, of course. Grand Riverkeeper "used pike as an example of a species that would experience … major reduction in juvenile habitat from" – 600 and – "6,349 hectares to only 3 … after impoundment."

And we "expressed concern that Nalcor's Habitat Utilization Indexes were based on estimating overall habitat area and did not take into account the complex relationships between species."

And again, I go back to this – to the idea of ecosystems and how they form over millennia and how these things are, you know, slowly but surely created.

"The Panel" – then – "concludes that because of uncertainty about the effects on fish and fish" – habitat – "populations caused by the number and scale of changes in the aquatic environment as a result of" – the – "reservoir creation, the uncertainty about the effectiveness of habitat compensation, and the risk that at least some of the fish habitat lost would not be effectively re-created, the Project would result in" – potential – "irreversible, significant" and adverse environmental effects to fish habitat and the fish assemblage.

MR. LEARMONTH: Okay.

MS. BENEFIEL: So again, you know, we are still not sure how this fish habitat situation is going to work.

And somewhere in here we've discussed the fact that, you know, some DFO scientists have even gone back and looked at how fish habitat compensation worked and has shown us through their writings that it doesn't work and that DFO actually doesn't have much capacity to even check behind this. Never mind the fact that even if proponents do the work, that DFO doesn't have the capacity anymore to go behind and check and make sure that's it done.

And then the environment commissioner wrote an – wrote a whole document about DFO's lack of ability to look at fish habitat and even talked about the – you know, we mentioned the irrevocable line of credit; they even talked about that.

And they were unable to determine what DFO had done with $122 million since – from such and such a date to such and such a date – and didn't know whether they had used it to recreate habitat, or …

So the mitigation measures that Nalcor, throughout this whole process, has told us is gonna happen – it – we have no confidence in that.

MR. LEARMONTH: Okay. Thank you.

Paragraph 155, page 40, "Wetlands and Riparian Habitat." Can you take us through that topic please?

MS. BENEFIEL: Page?

MR. LEARMONTH: Forty.

MS. BENEFIEL: Oh sorry.

MR. LEARMONTH: The top right-hand corner there.

MS. BENEFIEL: Sorry.

One of the experts that we hired was Dr. Annette Luttermann, who did her Ph.D. on the riparian habitat of the Lower Churchill River. And she came over, and she spoke at the hearings for us. And we talked about this, of course, "the spatial extent of the wetland, marshes and estuarine habitat that were considered in Nalcor's analysis."

We "noted there were no studies on wetlands in the river valley before the Upper Churchill came on," and "so recent studies just assumed that the current state is the baseline." We "stated that given the changes in temperature of the water," the – "changes in sedimentation, changes in flow volume and velocity, and nutrients, that we expected the effects of the project on those wetlands would be adverse and that it was just one example of 'downstream effects' that had not been properly studied and documented by Nalcor."

And Dr. Luttermann, you know – if you go to the CD of the environmental assessment panel hearings in the documents, you will see that Dr. Luttermann – she explained why –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – she didn't believe that these things would ever work, their recreation.

MR. LEARMONTH: Yeah.

I think Dr. Luttermann's concerns are covered in paragraph –

MS. BENEFIEL: Yes.

MR. LEARMONTH: – 157 –

MS. BENEFIEL: Right.

MR. LEARMONTH: – and 159. Well, 159 in "Riparian vegetation."

MS. BENEFIEL: Right.

MR. LEARMONTH: Is that correct? Is that –

MS. BENEFIEL: Yes, that's right.

MR. LEARMONTH: – your understanding of her concerns?

MS. BENEFIEL: Pardon me?

MR. LEARMONTH: Is – are the paragraphs that I just referred to a correct statement of your understanding of the concerns that were expressed by Dr. Luttermann?

MS. BENEFIEL: Yes.

MR. LEARMONTH: Yes.

MS. BENEFIEL: Yes –

MR. LEARMONTH: Okay.

MS. BENEFIEL: – absolutely.

MR. LEARMONTH: Okay.

So we have those before us.

MS. BENEFIEL: Right.

MR. LEARMONTH: Okay.

On that topic, is there anything further you'd wish to state, Ms. Benefiel?

MS. BENEFIEL: Well, again, wetlands are supposed to be created by Nalcor, and again, we're very concerned for a lot of reasons, but one thing is, you know, this project has gone from 6.2 billion up to 12.7 and God knows how far more. We don't know that it's stabilized. And so how is Nalcor going to be able to afford to do the mitigation measures that they've said they're going to do? How is the Government of Newfoundland or the different departments that have to verify that these mitigation measures have been done, how are they going to do their work?

With, you know, a province that is in debt for this project, so deeply, that we don't even – I don't know how people are gonna be able to afford their light bills out here but –

MR. LEARMONTH: Yeah. (Inaudible) –

MS. BENEFIEL: – I know I'm off track a bit but –

MR. LEARMONTH: You're off track a bit, yeah, but so your –

MS. BENEFIEL: – but the mitigation measures –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – are a real concern for us.

MR. LEARMONTH: You're concerned that the province and Nalcor will not allocate –

MS. BENEFIEL: Absolutely.

MR. LEARMONTH: – the funds to undertake any mitigation measures that they've agreed to –

MS. BENEFIEL: Right, exactly.

MR. LEARMONTH: – carry out. Is that a summary –

MS. BENEFIEL: Exactly.

MR. LEARMONTH: – of your position?

Okay, thank you.

THE COMMISSIONER: Just before you move on, Mr. Learmonth, if you look at paragraph 168.

MS. BENEFIEL: 168.

THE COMMISSIONER: So like the habitat, was there a compensation plan adopted?

MS. BENEFIEL: "… a detailed riparian habitat …." There may have been. I'm not certain. I don't know that I've seen it.

MR. LEARMONTH: Can I move on now?

THE COMMISSIONER: Yes, thank you.

MR. LEARMONTH: Thank you.

Paragraph 169, page 43, is – the heading is alternatives and sustainability. Now, Philip Raphals will be testifying today, so I think he can speak to this if that's –

MS. BENEFIEL: Yes.

MR. LEARMONTH: – acceptable to you. You'll leave it to him?

MS. BENEFIEL: Yes.

MR. LEARMONTH: Okay.

Now, the – some of headings here, like, on page 44: Smaller, Local Projects a More Suitable Alternative. That's not really environmental as much as – I think we can leave that.

Once again, on page 44: Corporations Selling Power in Conflict with Conservation. Did you want to say anything about that? That's on page 44 at the bottom.

MS. BENEFIEL: Yes –

MR. LEARMONTH: In terms of the environment – yeah.

MS. BENEFIEL: Well, on demand-side management we didn't –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – we didn't feel like –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – that Nalcor would – I mean, and even more so now that we see that that Power Purchase Agreement was put in place and that, you know, the people of the province have to pay the price for this project.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: We can't see that they would do anything to decrease the use of power.

MR. LEARMONTH: Yeah. Well, I think Mr. Raphals is going to cover that too (inaudible) –

MS. BENEFIEL: Yes, he's going to cover that, probably, yes.

MR. LEARMONTH: – he's very familiar with that.

MS. BENEFIEL: Yeah.

MR. LEARMONTH: All right.

Well, Economic Impacts on page 45 – we don't need that.

Forty-six, perhaps we can just make a quick statement on the contents of paragraphs 182 and 183: Access to the River and land. Just a brief commentary on that, please.

MS. BENEFIEL: Well, you know, I can just read it to you. It's paramount to who we are in Labrador.

MR. LEARMONTH: Well, if it's paramount, I wish you'd read the paragraphs.

MS. BENEFIEL: Yes.

MR. LEARMONTH: Please.

MS. BENEFIEL: So: "Being … on the land is integral to what it means to be Labradorian." And honestly, it's one of the reasons why – I lived away in the United States for 30 years, but when someone asked me where I was from, I never said Memphis, Tennessee – I always said Goose Bay, Labrador. Because I was proud of being a Labradorian by choice, I call it.

So: "Some of the most devastating impacts of the Project will be blocking and interfering with access to places of cultural significance. Damming of the river has inundated many traplines and portage routes. Unsafe ice conditions will cut off winter travel routes. In effect, cutting off Labradorians from the land." And I think specifically we're concerned about the river itself and how people travel on the river in the winter and how Mud Lake people come back and forth to buy their groceries and to go to work.

"We note that studies from the Labrador Institute and many others have demonstrated the link between loss of access and connection to nature and adverse health impacts." And I believe we provided you a copy of that study.

MR. LEARMONTH: You did, yes.

All right, under the heading: Ice Conditions making Winter Travel Dangerous.

MS. BENEFIEL: Mm-hmm.

MR. LEARMONTH: Do you want to make a statement on – a summary statement of the concern that you address in paragraphs 184 to 191, on page 47?

MS. BENEFIEL: Well, when water is held behind a dam for a period of time – now, understandably, we know that the reservoir for the Muskrat Falls Project will be held for only two days, 48 hours, and then it has to be released. Depending on how much water is released from the Upper Churchill – that water warms and it changes ice conditions downstream when it's released.

When the dams are put in place – there used to be an ice bridge that formed down across Mud Lake, and it would form in – sometimes in a matter of hours, I'm told by the people who use that ice bridge all the time – or the ice road. And blocks of ice would come down from the river, from above Muskrat Falls during the spring, and all of that would jam up together at the mouth of the river and people could cross there a lot earlier than when the rest of the river thawed.

So they would cross – because the big ice pans came and blocked themselves in, they formed an immediate, overnight sometimes, road for snowmobiles. And that's not gonna happen anymore once the project is built. That's – those ice roads won't form like that because all the ice will be kept behind the – you know, the big pans of ice, of course they have to protect the infrastructure, so the big pans of ice will be held behind the reservoir.

MR. LEARMONTH: And that will make winter travel more dangerous.

MS. BENEFIEL: Yes, absolutely.

And when we hired Dr. Rosenberg – and he did a presentation for us – he didn't really have time to look through the whole document that Nalcor – all those documents that Nalcor had.

MR. LEARMONTH: Mmm.

MS. BENEFIEL: But he'd been working on various hydro projects in the North for years. And he'd talked about the northern rivers in Manitoba, and other places that he'd looked at, and he said that, you know, ice conditions have

changed in these Manitoba rivers. And he did the studies on them so, you know, it kind of corroborated what we felt was gonna happen with the Lower Churchill.

MR. LEARMONTH: Yes.

Next topic, page 47, paragraph 188: Access to Portage Route at North Spur and around Muskrat Falls not maintained nor available despite being promised.

Can you discuss that point, please?

MS. BENEFIEL: Yeah, we had a report from a canoe group who came down the river. One of the things Grand Riverkeeper does every year that we're asked to – well, we try to paddle the river ourselves, a few of us of course, and we act as a conduit for people who want to travel the river. They take their vehicles up to Churchill Falls and put their canoes in and then we take their vehicles back and pick them up when they take out.

And we got a report from one of them that they couldn't get off the – at Muskrat Falls because there was no portage anymore. And that's one of the things that Nalcor was – promised that we would not lose the portage at Muskrat Falls for, you know, for any more than a week or two. I'm not sure exactly the statement but it's in here somewhere, I believe, in the document.

MR. LEARMONTH: Yes.

MS. BENEFIEL: And then last year, we paddle ourselves and we (inaudible) – the rocks on the upstream side of portage are so big there's no way you could haul a canoe up over it, you know, you can't walk on it. And there's no portage left, and that's an old portage that was used for centuries. So –

MR. LEARMONTH: And that's something you personally observed, is it?

MS. BENEFIEL: Yes, absolutely.

MR. LEARMONTH: Yeah, okay.

MS. BENEFIEL: So we had to paddle into Lower Brook and it took us an extra four hours.

MR. LEARMONTH: Yes.

MS. BENEFIEL: We had to drag the canoe over rough water and –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: Right, and so this is an issue that – it's a minor thing, maybe –

MR. LEARMONTH: But it's still there, yeah.

MS. BENEFIEL: But it's still there.

MR. LEARMONTH: Yeah.

Okay, next topic, page 47, paragraph 188: "North Spur Portage Route" was that – is covered by the earlier comments? I guess it is, is it?

MS. BENEFIEL: Yes.

MR. LEARMONTH: Yes, okay.

Impact – oh, yes – Impact on Caribou, page 47, 192.

MS. BENEFIEL: Mm-hmm.

MR. LEARMONTH: Can you summarize your position on that issue and how it was addressed by Nalcor and/or the provincial government during the Joint Review Panel process?

MS. BENEFIEL: Well, we did talk to the wildlife officer, who was here for so many years, Mr. Stu Luttich, and he agreed to come on and talk for us at the hearings on – by telephone. And, you know, he talked about the effects on the caribou and the George River herd and the Red Wine herd, and he basically said: Where, you know, any time people are infiltrating the caribou habitat, we're definitely making – having effects on their – impacts on their lives.

We didn't know until the very last day, or so, before the hearings ended that the caribou herd – the George River herd – but actually, a report just came out that they were down to, like, less than 20,000 from – or less than 8,000. I don't remember the exact amount. But you have to remember that going back a few years that this herd was up to 800,000 animals.

And, of course, as I said earlier, the – you know, Nalcor's own reports on the Red Wine herd, they're down from 80 or 90 animals to 20 as of 2017. We haven't seen anything for 2018 yet. So –

MR. LEARMONTH: So the impact of the project on –

MS. BENEFIEL: On the caribou is –

MR. LEARMONTH: – wildlife was –

MS. BENEFIEL: – it was – you know, they said it's gonna be insignificant and we believe it would be significant. Any time you impact an endangered herd, by even one animal, that's a significant impact.

At the time, Perry Trimper was the MHA for Labrador and he advised Mr. Luttich on the phone that Nalcor intends to decommission all of the roads, which was one of the things that Mr. Luttich talked about. That, you know, roads –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – that were built for the project work are open to people to travel on in the wintertime and in the summertime and that that would impact the caribou because people could hunt a lot easier, and that's another mitigation measure that we're very concerned about.

MR. LEARMONTH: You're just waiting on it –

MS. BENEFIEL: That these roads would be decommissioned properly.

MR. LEARMONTH: Yes, okay.

Now, on page 50, paragraph 206, and then carrying on to page 51, the two topics are: Forests and Timber and Wood Wastage – Rotting Merchantable Wood.

Have you already covered that or would you like to supplement your earlier comments by something (inaudible) –?

MS. BENEFIEL: I think that's pretty well been covered.

MR. LEARMONTH: Yes.

MS. BENEFIEL: I'd like to just state what the panel said.

That they conclude: "… in light of the scale of terrestrial habitat that would be inundated by the Project and the permanence of the effect, that the overall loss of terrestrial habitat is significant." And, of course, that includes the flooding, the reservoir area and the forestry part of it.

MR. LEARMONTH: Okay.

Just looking at page 52: Environmental Flow Standards. I think, perhaps, Dr. Raphals will be – Philip Raphals, will be dealing with this. Is there anything you'd want to add to that, to what –?

MS. BENEFIEL: Dr. Rosenberg's, you mean?

MR. LEARMONTH: Yeah.

MS. BENEFIEL: Yeah. Actually, yes, I do.

MR. LEARMONTH: Well, please, go ahead.

THE COMMISSIONER: Maybe what I will do is – I just noticed my watch, and now it's five after 11 –

MS. BENEFIEL: We'll take a break.

THE COMMISSIONER: Yeah, let's take a break. And that will give you a chance to look at that and –

MS. BENEFIEL: Great.

THE COMMISSIONER: – so we'll take 10 minutes here now.

MS. BENEFIEL: Great. Thanks.

CLERK: All rise.

MR. LEARMONTH: Okay.

Recess

CLERK: Please be seated.

THE COMMISSIONER: All right.

So we were on the Environmental Flow Standards.

MR. LEARMONTH: Yes.

Yes, Ms. Benefiel, can you turn to page 52, paragraph 220? You indicated you wanted to make some comment under this topic.

MS. BENEFIEL: Environmental flows, yes.

MR. LEARMONTH: Environmental flows standards.

MS. BENEFIEL: So environmental flows are important for ecosystem services, and the ecosystem things that have to happen for fish to survive, and for this to happen and that to happen, and for stabilization of wetlands and those kinds of things. And we've asked many, many times and – you know, we've learned this from the *Dams and Development* book that environmental flows – in fact, that any time a dam is built, it cannot – according to the World Commission on Dams, a dam cannot be called green unless it has environmental flows, proper environmental flows that maintain the downstream issues for fish and habitat.

So we've talked about it an awful lot. And the more we've learned, the more we realize that environmental flows are even more important than we thought. Dr. Rosenberg talked about it in his presentation, and the panel recommended that if the project is approved that the provincial Department of Environment and Conservation, in consultation with Fisheries and Oceans, would develop environmental flow standards for the Lower Churchill with respect to flows, magnitude, frequency, duration, et cetera, et cetera.

And as of now, we have no idea whether – I mean, we don't know how that could be – could happen, really. You know, environmental flows talk about – like, in the spring, there's a spring freshet, and that happens and brings all the little tributaries from the mountains down into the river valley and brings nutrients, and so on. And the nutrients, then, often with dams fall out at the dam and they hit the bottom of the river, and when water is turbined it doesn't have those nutrients in them. So we're worried about that, and we think that that's a really major issue.

In fact – it's a long – I'll try to shorten it as much as I can. Last year in November, we – which is nothing to do with the pre-sanction – but we hooked up with 22, or so, environmental groups in the northeastern US and formed a new organization.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: And one of the reasons for that is because Hydro-Québec has decided they want to sell power into several of the United States – northeastern United States. One of them is Maine. And a fellow wrote into the CMP – the C – anyway –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – the Central Maine Power corporation, and he quoted a couple of documents that we got really interested in.

And, in fact, we are finding that environmental flows and backing up water behind dams and the letting it out in the winter when you need generation, instead of in the spring freshet when it's normal, has affected all kinds of issues around the world. And it – the big dams in James Bay and down towards the Saint Lawrence River and the Labrador Current have been affected. The food sources have been affected. And the cod disappearance is being – is now being talked about as part of the effects of all these dams.

So ecosystems are important. You know, how ecosystems move through their processes for many, many, many years, and how flow standards are – need to be maintained is all something we talked about. And now we have a new – two or three new reports, actually, that we will present in Phase 2, if possible, that corroborate what we've been saying.

MR. LEARMONTH: Okay, thank you.

Now, on Ecosystem Services, is that related to environmental flow standards? I'm looking at page 53.

MS. BENEFIEL: It is.

MR. LEARMONTH: It is?

MS. BENEFIEL: Absolutely.

MR. LEARMONTH: So that's covered –

MS. BENEFIEL: Well, it's – ecosystem services is what Dr. Murray Rudd tried to talk about in his presentation.

MR. LEARMONTH: That was with Dr. Nejem Raheem as well?

MS. BENEFIEL: Nejem Raheem.

MR. LEARMONTH: Yes.

MS. BENEFIEL: Yeah, he presented for Dr. Rudd. Dr. Rudd has –

MR. LEARMONTH: Yes.

MS. BENEFIEL: – moved to England at the time.

But the idea of ecosystem services is that you value your ecosystem services and you use a cost-benefit type analysis to figure out whether a project really is environmentally sustainable. And so when Dr. Raheem made his presentation – excuse me for just a sec – when he made his presentation, he – it was on the phone – oops, sorry.

THE COMMISSIONER: Just take your time for a second there.

MS. BENEFIEL: I'm fighting a cold with echinacea as fast as I can but it's catching up with me.

So Dr. Raheem presented what they did for GRK at the hearings of the JRP panel out here in St. John's. And at the end of his presentation, I believe it was Gilbert Bennett said: You know, this is not what we're into, we're not doing ecosystem services here, we're doing an environmental assessment.

Well, in our view, if you're going to destroy natural capital and ecosystems, you need to know what value they have to people. I mean, why do we do environmental assessments? It's because of people. You know, if it wasn't people, we wouldn't even ask for an environmental assessment. So if these ecosystems give us fish, good fish that are not methylmercury laced or, you know, places where we can go to paddle or whatever, then those ecosystem services need to be valued, and those values need to be put in against the benefits of the project.

And that's what we proposed all the way through, but Mr. Bennett said: We're not in an ecosystem-type situation here, we're doing an environmental assessment. Which to us, and obviously to Dr. Raheem and Dr. Murray Rudd, it's all the same thing and it should be considered.

MR. LEARMONTH: Yeah, okay. Thank you.

Page 56 is part 4 under the heading Subsequent Processes, and you refer there to the comprehensive study on the Labrador-Island Transmission Link. Is there anything you wanted to add in addition to what you've stated in paragraph 234?

MS. BENEFIEL: Okay. So that's on the other –

MR. LEARMONTH: Yes.

MS. BENEFIEL: – the Comprehensive Study.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: Yeah.

So we got some money to get involved in that as well. And we did take a trip in my old van; had a flat tire before we even got to Cartwright. And we met with every community along the coast and got input from them about –

MR. LEARMONTH: When was this?

MS. BENEFIEL: This would've been 2012.

MR. LEARMONTH: Okay.

MS. BENEFIEL: So – oh, so that would be right after – yeah, that's –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – the environmental assessment for the Transmission Link. But remember that we said, all the way through this, that cumulative effects of these projects could not be assessed without assessing them together. So just that it was in 2012 doesn't really mean that – to us it was the same project, 'cause you can't build –

MR. LEARMONTH: Separate them.

MS. BENEFIEL: They're separated but now they're all together.

MR. LEARMONTH: Yes.

MS. BENEFIEL: You know, when you talk about the money you're still talking about both: the Muskrat Falls Project and the Transmission Line. So they are together and they should've been together for the assessment process, in our view.

MR. LEARMONTH: The – okay, the Public Utilities Board, 235 and 236, Mr. Raphals will be dealing with that, so I think we –

MS. BENEFIEL: Yes.

MR. LEARMONTH: – can leave that to him.

MS. BENEFIEL: Yes, I think so.

MR. LEARMONTH: (Inaudible.)

And the Federal Court Action, that's just a reference to, I think, there was a decision in the Federal Court of Canada, December 20, 2012, where your application, together with an application from other parties, was dismissed. Your application for judicial review was dismissed.

MS. BENEFIEL: Yes, it was.

MR. LEARMONTH: So that was the end of the legal process.

MS. BENEFIEL: I'm sorry?

MR. LEARMONTH: There was no appeal filed. I guess that was the end –

MS. BENEFIEL: No.

MR. LEARMONTH: – of the road as far as –

MS. BENEFIEL: Well, we didn't have –

MR. LEARMONTH: – legal –

MS. BENEFIEL: – any money to file another one.

MR. LEARMONTH: Oh, yes. I understand, yeah, yeah.

Now, part 5, the final part, is the Mitigation Measures Promised, but Not Necessarily Monitored, and this is starting at page – paragraph 238.

Could you please take us through part 5? Right up to the beginning of the conclusion, please.

MS. BENEFIEL: Okay.

So in 238 I've already pretty much stated that we had – we have and had increasing concerns with the adequate oversight and monitoring measures in place. Nalcor and the government may not follow through in its obligations and we're, you know, we're very skeptical about that. Adaptive management is something where, you know, you change things as you go along, but in order to change things that you've done wrong you have to know what you did wrong, and monitoring has to be done.

Another thing that we advocated, and we do this at the Environmental Assessment Caucus as well, as part of what we hoped the new impact assessment would contain, is that at the end of an environmental assessment there would be a depository for all of the work that was done on – in, you know, proper studies. And that anyone who wanted to build a new hydro project, that had the same type of issues, could go to that and understand, you know, what happened here. And the mitigation measures would have to be put onto that, and the adaptive management items would have to be put onto that depository website.

We don't know if we're gonna get that but we believe that, you know, every time a new project comes up in this country, a new environmental assessment is like – nobody's ever heard of this before. And work has been done in so many

different places. And I know that Nalcor has – they've relied on work done by Hydro-Québec, they've relied on some work done in Manitoba Hydro. But there's no place for people like us, who wanted to look at what the issues were on an old hydro project, to go and be able to pull information out and be able to say to Nalcor: Well, this happened for instance, in – on the whatever river, Fraser River in BC – oh, my, they'll shoot me if they think I was advocating for a dam on the Fraser River in BC.

MR. LEARMONTH: You'd better let that one go.

MS. BENEFIEL: I'd better let that one go.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: But, you know, for us, we had very little money, very little capacity. If the Government of Canada would put a site that had all of these studies and a good list, we could've gone to them and had some information about that.

So that's one of the things that we've recommended as far as, you know, mitigation and adaptive management was concerned with our concern.

MR. LEARMONTH: Okay.

MS. BENEFIEL: So we had Environmental Financial Assurances – and that's, again, I'm talking about the – or we are talking about the Fish Habitat Compensation Plan and the fact that, you know, we've done – we've had information from the environment commissioner and from Jason Quigley, a retired DFO officer, and various others that say that, you know, the mitigation measures – they don't know if the new habitat actually works because some of it wasn't even done. And what was done, nobody had the capacity to really check into it – well, not all of it of course, but some.

Nalcor, at a HADD, a habitat destruction and – whatever HADD stands for – can't come to my mind right now. But they did call a – invited guests only to a meeting about habitat re-creation, as set out in the Fisheries Act, and they decided and they reminded us that they didn't have to do that. That they were doing it to get some information about what we felt about the re-creation of habitat. And, of course, we stated that we didn't think that they could re-create all this habitat and have it be totally effective.

So – yeah, and that's where DFO indicated to us that Nalcor would be required to provide that irrevocable letter of credit, which we've been trying to find for –

MR. LEARMONTH: Yes.

MS. BENEFIEL: – the last two or three years. So – and then we have a report from the Commissioner of the Environment and Sustainable Development and those quotes are there, so –

MR. LEARMONTH: Yes, I know, in paragraph 242. Yes.

MS. BENEFIEL: Yes.

MR. LEARMONTH: Yeah.

And there's also a reference in paragraph 243 to the –

MS. BENEFIEL: Right.

MR. LEARMONTH: – commissioner expressing concerns of the department's management of such environmental financial assurances?

MS. BENEFIEL: Exactly –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – at 243.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: And, you know, again, you know, we go back to the Stephen Harper days when suddenly the Department of Fisheries and Oceans was cut by, like, 25 per cent. And we're in the middle of all of this and we're saying just – you know, they couldn't monitor it before, how are they going to monitor it now? So –

MR. LEARMONTH: So the next topic is: Monitoring, Mitigation and Management.

Starting in paragraph 245, where you referred to Dr. Rosenberg's presentation.

Could you take us through that topic, please, Ms. Benefiel?

MS. BENEFIEL: I've actually talked about it a little bit already –

MR. LEARMONTH: Yes, but –

MS. BENEFIEL: – he says –

MR. LEARMONTH: – are there any supplementary comments you'd like to make?

MS. BENEFIEL: Only that Grand Riverkeeper is not – you know, we're not the only people speaking out about these kinds of things. That, you know, Dr. Rosenberg has been involved, he has 57 years' experience with fisheries and with hydro projects and so on, and, you know, many others. We couldn't possibly bring in all the documents that we've reviewed but –

MR. LEARMONTH: No. Okay, that's fine.

Last topic, before we get to the North Spur, is the Collapse of the George's Island Caribou herd, beginning in paragraph 252. Do you have anything you'd like to add to your comments in paragraphs 252 to 255?

MS. BENEFIEL: I'd go back, again, to the capacity and to the amount of time that DFO and the government of the day, whoever it happens to be, will spend. They put 300 caribou out on George's Island and the local people said: You can't leave them out there. They collared them and they said: You can't leave them out there because they're gonna reproduce and they're gonna eat themselves out of house and home. And – but that's anecdotal evidence and they say: You need to have a hunt but – what's the word I used? I didn't use it, they did. Well, anyway, you need –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – to hunt some of these animals in order to maintain the fact that they're on an island and to keep them as able to look after themselves as they possibly could. And it took forever for the government to do anything about that. In fact, they never did. And all of those 300 animals actually perished on that island. They just starved to death.

So these are, you know, these are things that – if government doesn't move, if DFO doesn't move, these are the kinds of things that can happen, and we're very concerned about that.

MR. LEARMONTH: Okay.

Now, next I wanna turn to the issue of the North Spur. An uncontroversial subject, is it?

MS. BENEFIEL: No, of course not. I'm being facetious.

MR. LEARMONTH: Yeah.

And what we've done, Ms. Benefiel, is we've put together in binder 2 – in your binder 2, Exhibits 00434 and 00450. We put a series of documents which we understand is a – maybe not exhaustive, but a fairly – if not a fairly complete list of the documents that relate to the North Spur and the stability issue of –

MS. BENEFIEL: Mm-hmm.

MR. LEARMONTH: – the North Spur. And they, of course, include the reports of the remediation, shoring up work that Nalcor has completed, and also contained are the reports of Dr. Stig Bernander. And the document at tab 11, if you see – excuse me, tab 1, which is P-00434, I think, is the last report of Stig Bernander and Leonnart Elfgren. Are you – yeah.

Now, I'd just like to – we're not – the Commissioner will not be making a decision as to whether adequate remediation steps have been taken by Nalcor. Rather, the Commissioner will be asked to make a decision on whether reasonable steps were taken by Nalcor to address this matter. So we're not going to get into a discussion about: Well, this didn't – this isn't gonna work or this is gonna work. It's whether reasonable steps were taken.

So can you comment on that? Whether, in your view, Nalcor has taken reasonable steps to address the concerns that your group had, up to the time of sanction, with respect to the North Spur?

MS. BENEFIEL: Actually, we don't believe that they have taken all the steps they should've taken. And we are not scientists, we're not geotechnical engineers, we're not geologists, but we live downstream. My house, my cabin, is in the wake of a flood – if it should happen. The Mud Lake people are worried, especially after what happened last year.

So at some point – and I tried to remember whether we started talking about the North Spur before the JRP process, but I know we talked about it during the JRP process. But after that we learned more, we, you know, dug out more information and – about Leda clay and about – well, it's called quick clay. And Cabot Martin was – got involved, and was – he is a geologist and he gave us information. We went on his website and we read a book that he wrote. And so more and more we started to learn what was going on with the North Spur.

And then, I believe it was Cabot Martin who met Dr. Stig Bernander, at the – sorry – at a meeting about dams in Montreal, I believe it was, and invited him to come to Labrador and to Newfoundland, and have a look. So he did come, it was in October, I remember, and I think we nearly froze him to death. But anyway, it was late October. We took him up in helicopter and let him review all of – all the way up to Gull Island. We took him in boat. He saw the landslides that were below Muskrat Falls, and we went in on the North Spur and he walked around and, you know, looked at samples of the clay and so on and so forth.

And then he started to write about it for us, and there are several – I know in this –

MR. LEARMONTH: Yes.

MS. BENEFIEL: – whole document here there are samples of the letters and reports that he wrote. One of them was for the Public Utilities Board which they claimed were – was not – the Public Utilities Board in the DarkNL type review are looking at reliability issues and, I believe, they started out just looking at the reliability issues on the Island and then they incorporated reliability –

MR. LEARMONTH: Hmm.

MS. BENEFIEL: – issues including –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – after sanction –

MR. LEARMONTH: Yeah.

MS. BENEFIEL: – after Muskrat Falls comes on line. So at that point, we thought we should get involved in this because this is one big reliability issue. So that was the reason, you know, we got involved with the Public Utilities Board. I just –

MR. LEARMONTH: That's post-sanction. So we're (inaudible) –

MS. BENEFIEL: Yes, it is. But it gives you a little context of –

MR. LEARMONTH: Yeah. Okay.

MS. BENEFIEL: – of how we got involved with the Public Utilities Board. But as far as – you know, Dr. Bernander was actually post-sanction too, I believe.

But in any case, it is an example of why we – how we reached out to as many people as possible. We did have Dr. L'Heureux came and – from the Swedish Institute – I can't remember –

MR. LEARMONTH: Mm-hmm.

MS. BENEFIEL: – the exact name of it. And it was in the middle of the winter and he went up and took a look at it and he decided that SNC-Lavalin and Nalcor had done a pretty good job.

MR. LEARMONTH: Yes.

MS. BENEFIEL: And so what they've done – they've done a lot of work, we know that. But Dr. Bernander is saying what they haven't done is a proper risk assessment using the most recent methods –

MR. LEARMONTH: Yes.

MS. BENEFIEL: – which of course he devised and did his Ph.D. on. So, you know, there's one more way to ensure and help the people in Mud

Lake feel a little bit better about going to bed at night once this project is raised up to 90 metres or 90 feet – whatever it is.

And so we've asked and asked. We've asked – we've written letters to government. We've asked Nalcor. We've done whatever. We've been to our MHA, our MPs. Anybody we could discuss it with. Like, please, just do the kinds of studies. Well, apparently, you know, they've decided we were pushy enough that they needed to a peer-review study, which they did in – and this is after sanction as well, but just to give you context of where this is at, at this moment. So they had a peer-review study done, but in the peer-review study right in the beginning they state – well, like, you know, most studies they will say: We're using documents that were provided by our client. And they did state that but they stated it quite a few times in their preamble to the – or their –

MR. LEARMONTH: Just for the record, maybe you could bring up P-00439. That's the Geotechnical Peer Review, I think, that you're referring to; that would be in tab 6 of your documents.

MS. BENEFIEL: Okay, okay.

MR. LEARMONTH: Can you just confirm that that's the document you're referring to?

MS. BENEFIEL: Right. Oh, it's a disclaimer, sorry.

So in several places in this disclaimer they, you know –

MR. LEARMONTH: Mm-hmm, yeah. But – okay, so we've got all these reports, and as I said you don't need to go through them, they're all here and they'll be considered, certainly, by the Commission and dealt with, with other witnesses. But I take it that the – your position to be that without this final risk assessment that you are not satisfied, or your group is not satisfied. Is that correct?

MS. BENEFIEL: We are not satisfied, for many reasons, that SNC-Lavalin and Nalcor have done the right work. They've done lots of work but they haven't done the right work. And I'm not gonna sit here and tell you that if Dr. Bernander were to come over here and do everything that he thinks ought to be done, that that's gonna be perfect, because it could be that these risk assessments, that he's advising should be done, could provide information to the contrary.

It may provide information that says when the water behind the dam –

MR. LEARMONTH: Yes.

MS. BENEFIEL: – is raised up to 90 feet – is it – yes, 90 feet – that that could collapse at some point – the North Spur. The other problem is there's leakage, there's seepage always through the North Spur. And again, back to mitigation measures, the panel recommends that Nalcor has to mitigate and follow up and do, you know, on a regular basis, do assessments of what's happening on the North Spur.

And I understand that they have put in some kind of an alarm system that will tell them that, you know, if something is moving. But we don't know how effective that is. It's never been discussed with us. In fact, they have a monitoring group that they formed and no one from Grand Riverkeeper was ever asked to be on that group.

MR. LEARMONTH: Okay.

MS. BENEFIEL: So –

MR. LEARMONTH: So that concern is still out there.

MS. BENEFIEL: That concern is still there, absolutely.

MR. LEARMONTH: Okay.

The last thing I'd ask you to do if you'd be good enough, Ms. Benefiel, is turn to page 61 of your – the first binder.

MS. BENEFIEL: Okay.

MR. LEARMONTH: This is your conclusion. And to conclude your evidence I would ask you to read into the record your conclusion on page – paragraph 256 to 260, if you can take the time to do that.

MS. BENEFIEL: Sure.

MR. LEARMONTH: Yeah.

MS. BENEFIEL: So: "It is difficult not to be cynical about Newfoundland's relationship with Labrador and its Natural resources." I've talked about that on various occasions. "GRK participated actively in all aspects of the consultative processes leading up to sanction" – we did so in good faith and we believed that given the knowledge and "known significant and detrimental impacts that the Project would have on the River, its ecosystem and the local residents" that such a project could never be sanctioned.

"Dr. Rosenberg describes environmental impact assessment … in Canada:" – he says – "'I contend that environmental impact assessment has not progressed much in the past at least three decades that I've been a practicing scientist in Canada. It usually is **a rigidly defined bureaucratic process**. It produces large amounts of descriptive work that does little to predict the effects of the upcoming development.'

"… GRK and many Labradorians," – to us – "the fact that the Government of Newfoundland was not required to comply with" – a lot of – "the recommendations of the Joint Review Panel prior to commencing construction" – it – "meant that the process was nothing more than an illusion of consultation to justify" what they wanted. "Perhaps the most cynical among us believe the EA was a distraction to keep us busy while the politicians and businesspeople made deals.

"It was not until construction began and inundation was imminent that the community realized this process had been a sham. At that point, all formal legal avenues had been exhausted and the only way to stop the Project" – many of us felt – "was direct action, which resulted in many Labradorians being subjected to the colonial justice system." And they are still going through that system as we speak. I think 17 more people are still left to go through that system.

So we're hopeful, GRK is hopeful, LLP is hopeful that this Inquiry can provide some guidance to proponents of future projects. Not just environmental guidance, like we discussed a little while ago, but guidance, you know, "until the recommendations from Environmental Assessments are enforceable and environmental and public interest groups are granted standing" – like they are in Australia – we fear history will continue to repeat itself to the detriment of Labradorians and all citizens in Canada.

We just don't have a lot of faith in the environmental assessment process as it exists.

MR. LEARMONTH: Okay.

Well, Ms. Benefiel, I'd like to thank you for your evidence that you've given this morning and you'll now be – I'll now – the Commissioner will turn you over –

MS. BENEFIEL: Sure.

MR. LEARMONTH: – to the other parties who will have the right to cross-examine you.

Thanks again.

MS. BENEFIEL: Thank you.

THE COMMISSIONER: All right.

The Province of Newfoundland and Labrador.

MR. RALPH: No questions, Commissioner.

THE COMMISSIONER: Nalcor Energy.

MR. SIMMONS: We have no questions.

Thank you, Commissioner.

THE COMMISSIONER: Concerned Citizens Coalition.

MR. BUDDEN: Good Morning, Ms. Benefiel.

We, of course, have met –

UNIDENTIFIED FEMALE SPEAKER: Your mic isn't on.

MR. BUDDEN: Oh, great.

MS. BENEFIEL: It's okay, my hearing aid is on.

MR. BUDDEN: Okay.

We have, of course, met. As you know, my name is Geoff Budden, I represent the Concerned Citizens Coalition. I really just have one or two questions for you.

From your – listening to you today and reading your submission, it is obvious that your organization is attached – or attached quite a bit of importance to the Joint Review Panel process, can you tell us a little bit about that?

MS. BENEFIEL: Well, in the beginning, I guess, we, you know, we saw it as the only avenue for concerned citizens to have any say in the project. And we determined – and we were determined to do whatever we could possibly do to look at every aspect of this project. And I'm telling you that in my shed I have books that were up that high, of the *Environmental Impact Statement* and all of the information requests and so on. And we, you know, we hoped beyond hope that we could show that this river should not be dammed. Obviously, that didn't happen.

MR. BUDDEN: Sure.

MS. BENEFIEL: But I have to say, that it's not because the panel didn't agree with a lot of what we said. If you look at the panel report, you know, there are many places where the panel said, this is significant and it's adverse; where Nalcor said, it's not significant.

The one thing we did want the panel to do more of was go further with it and we felt that they had the right to subpoena documents. We read that in the *Environmental Assessment Act*, that they could've subpoenaed documents and they could've forced Nalcor to provide things that they didn't provide.

And so we actually took the environmental assessment panel to court, along with the Sierra Club of Canada and NunatuKavut at the time, to ask that the court put them back to work to look at the information that they had actually asked at the end of their report, that others do. Like looking at the economics and whether the project was going to have economic benefits –

MR. BUDDEN: Sure.

MS. BENEFIEL: – we thought that was their job. We felt that they should have done that.

MR. BUDDEN: So you don't feel the panel, perhaps, went far enough; but do you believe this Commission – perhaps, it would assist this Commission in the completion of its mandate to closely examine the work that was done and, perhaps, hear from some of the people involved in the Joint Review Panel process?

MS. BENEFIEL: Absolutely. And I was shocked that no one from the panel has been called as a witness, actually. Because, I mean, that's a very, very important part of this whole process. You know, a lot of the recommendations of the panel have not been adhered to – or a lot of the mitigation measures at the end.

You know, why isn't the panel here? I – you know, and I – you know, I have to – Mr. Williams yesterday got in a little trouble for recommending a couple of witnesses, but really, I mean, we recommend that someone from the joint panel should be here to talk to what they heard and what they said and what their recommendations were.

MR. BUDDEN: Okay.

Thank you, Ms. Benefiel, those are my questions.

MS. BENEFIEL: Okay. Sure.

THE COMMISSIONER: Okay. Edmund Martin?

MR. SMITH: No questions, Commissioner.

THE COMMISSIONER: Kathy Dunderdale?

MS. E. BEST: Good morning. I'm Erin Best, counsel for Kathy Dunderdale.

I don't have any questions for you this morning, I just noticed that you're the first woman to appear at the Inquiry and we wanted to thank you for your testimony today.

MS. BENEFIEL: Oh, thank you. Thank you very much.

This is International Girls Day, by the way.

THE COMMISSIONER: We knew that.

MS. BENEFIEL: So I've been informed. I didn't know it.

THE COMMISSIONER: Former Provincial Government officials '03 to '16?

MR. T. WILLIAMS: No questions, Mr. Commissioner.

THE COMMISSIONER: Julia Mullaley and Charles Bown?

MR. FITZGERALD: No questions, Commissioner.

THE COMMISSIONER: Robert Thompson?

MR. COFFEY: No questions, thank you.

THE COMMISSIONER: The Consumer Advocate?

MR. HOGAN: Morning. My name is John Hogan, I'm counsel for the Consumer Advocate.

MS. BENEFIEL: Yes.

MR. HOGAN: I just have a couple of quick topics to ask you about.

We had heard from a witness earlier in the Inquiry about how he advocated for smaller hydro projects on the Island, as opposed to building the Muskrat Falls, as an option that, perhaps, the government and Nalcor should have looked into.

MS. BENEFIEL: Right.

MR. HOGAN: I have two questions on that for you. From an environmental perspective, what's your views on that option?

MS. BENEFIEL: Well, to be honest with you, we recommended the same thing many times. Alternatives to the project, that was one of the things we said. You know, let's don't give our money away to all these big contractors that are going to take off with their money and leave us, let's do some small projects.

And so we got involved with the presentation that was done by Mr. Fisher and a few others at the Harris Centre, and we read through that and we said yeah, like, you know, some small hydro projects. We talked about the Ventus Energy project that was proposed by – excuse me – by the NunatuKavut, up on height of the land in Labrador, would have been the perfect place for a thousand megawatt energy project and you would have backup from the Upper Churchill.

They were planning on doing it with their own money, it wasn't going to cost the province anything. And, you know, the province because – and we believe this sincerely – because they were – I want to say a bad word but I won't – because they were so bent on producing power from Muskrat Falls and Gull Island, because they wanted to do that project so desperately, they said: no, we're gonna do our own wind energy so you – they didn't even let them go through an environmental assessment. They didn't even let them register for an environmental assessment.

So yes, environmentally, you can do river – run-of-river projects which, of course, this project has been called but it really isn't. If you look at the descriptions of run-of-river projects around the world, this one is not considered. When you have a dam that holds back water for 48 hours, it's not really a run-of-river project. So, you know, there could be run-of-river projects out here on the Island, there could have been some.

We had Dr. – not Doctor, Mr. Claude Angers, I think his name is – Anger – from Paris, France, came; and another fellow from Nova Scotia, and they presented here in St. John's at the hearings – towards the end of the hearings about LNG and using the salt mines over in the west somewhere to store gas and that would – I mean, you know, these are – there's all manner of different ways that 3 or 400 megawatts of power could have been produced in our opinion. Instead of doing all the damage that they've done in Labrador.

Out of mind – out of sight, out of mind, and that's our opinion.

MR. HOGAN: So that was my question from – I guess, an environmental perspective on those smaller hydro projects. I have a follow-up question on that as well, and you had some harsh words that Mr. Learmonth took you to in your conclusion of your report.

MS. BENEFIEL: Mm-hmm.

MR. HOGAN: And I'll just read them back to you, the way I jotted them down was that: this process – I guess the end of the process – would lead maybe people in your group to be cynical about Newfoundland's relationship with Labrador and its treatment of Labrador's natural resources.

MS. BENEFIEL: Right.

MR. HOGAN: So keeping in mind the advocacy for the smaller hydro projects, how does your group feel about that in terms of how you feel Labradorians are being treated, whereas the smaller hydro projects would have been done here on the Island as opposed to Labrador?

MS. BENEFIEL: Well, see, we have a little issue with that because we've been told that these hydro projects were not allowed because of the environmental damage. Well I'm going to tell you that the stack of papers – or the stack of documents that were at my home from the environmental assessment, you could not possibly – if you put a few hydro projects on rivers in Newfoundland – run-of-river projects –

MR. HOGAN: I just want to get your perspective on the fact that it was being – the decision –

MS. BENEFIEL: It's backwards –

MR. HOGAN: – was in Labrador as opposed to on the Island.

MS. BENEFIEL: Yeah, it's backwards. I understand what you're saying, what I'm trying to tell you –

MR. HOGAN: Yeah.

MS. BENEFIEL: – is that, you know, the damage to Labrador – to the river in Labrador – I think, far more damage than what could – would happen with small hydro projects. There are ways to do hydro that are not as damaging to the ecosystems.

MR. HOGAN: Okay.

MS. BENEFIEL: So that's our opinion. And wind energy. My God, you can't go outside the door here without getting your head blown off. You know, why isn't there more wind energy – I know, they've talked about they can't put wind energy up to more than 80 megawatts because then you have to spill water; well, spill your water.

MR. HOGAN: Thank you.

MS. BENEFIEL: You've spilled our blood actually – I'm sorry, not you, but you know what I mean.

MR. HOGAN: Okay.

And I just want a couple of follow-up questions on the Joint Review Panel, which you talked about in length. Your conclusion, again, that Mr. Learmonth took you to, you said: it was an illusion of consultation to justify a foregone conclusion.

Having now gone through the process, put a lot of time and effort and money into it, you and your group, do you feel looking back now that it was a foregone conclusion, and that the decision was made before the participation of the Joint Review Panel took place?

MS. BENEFIEL: Absolutely. May I comment –?

MR. HOGAN: Yes.

MS. BENEFIEL: – on that?

MR. HOGAN: Yeah.

MS. BENEFIEL: I think I told this story at the beginning, that I walked up to Danny Williams back when and I said please stop calling this a green project. And I listed the reasons why – or a few of them. And he just said: point taken. And I was – I thought: Well, that's not a very good answer; that means to me that this project's going ahead.

And –

MR. HOGAN: Last question –

MS. BENEFIEL: – and I'd like to correct one thing that you said –

MR. HOGAN: Sure.

MS. BENEFIEL: – with all the money we spent. We haven't spent – we have personally spent –

MR. HOGAN: $64,000.

MS. BENEFIEL: –a lot of – oh that.

MR. HOGAN: Right, yeah.

MS. BENEFIEL: We didn't get any of that, that went to all the – yeah.

MR. HOGAN: The last question I have: going into your participation in the Joint Review Panel, you've commented on the recommendations and how they haven't been acted on. What was your expectation going into the process with regards to any recommendations that were going to come out of that?

MS. BENEFIEL: Well, we knew that they were just recommendations, okay. We understood that and that was one of the issues we had with environmental assessments, period, and how they're written. You know, we feel that, like Australia, that citizens should have more voice. And I think that if we had a legislated law that said citizens have standing, that you'd find a lot more people get involved. I think people are defeated.

It's a Goliath – David and Goliath situation. It's – you know, people who work full-time jobs, they don't – and have children and houses to look after – they don't have the time to get involved in these things.

So, you know, if you ask me the question again – I tend to get off on tangents.

MR. HOGAN: The question was, I guess, what was your expectation on the recommendations? It sounds like you knew that –

MS. BENEFIEL: We knew they were recommendations.

MR. HOGAN: – they wouldn't legally have to be acted upon.

MS. BENEFIEL: But we hoped that the recommendations would be so strong that they would pay attention to them.

MR. HOGAN: That's all the questions I have.

MS. BENEFIEL: Thank you.

MR. HOGAN: Thank you.

THE COMMISSIONER: NunatuKavut Community Council.

MR. COOKE: Hi Ms. Benefiel, Jason Cooke.

It's just really a question, and maybe a dumb question, or clarification question, but your organization is called Grand River –

MS. BENEFIEL: Riverkeeper, one word –

MR. COOKE: Yes.

MS. BENEFIEL: Grand Riverkeeper Labrador.

MR. COOKE: Yes.

And just for the record, especially for those maybe, not from the province. The Grand River is the name of the Churchill River –

MS. BENEFIEL: Oh sorry.

MR. COOKE: The prior name of the Churchill River.

MS. BENEFIEL: I should – yeah. But we have been coaching the CBC and others to call it – and a lot of people are now starting to call it the Grand River.

MR. COOKE: Again?

MS. BENEFIEL: Again.

MR. COOKE: Great. That's my other questions. Thanks.

MS. BENEFIEL: Thank you.

THE COMMISSIONER: All right.

Ms. Urquhart?

MS. URQUHART: Thank you.

Good afternoon. Good morning, if it's still – oh it's – good afternoon.

So I just want to clarify a few quick points from your discussion there earlier with Mr. Learmonth.

MS. BENEFIEL: Mmm.

MS. URQUHART: Firstly – at one point you were talking about effects beyond the mouth of the river. You had a story to do with Gilbert Bennett, something that you'd – a comment that you'd made to him about effects beyond the mouth of the river.

Do you recall – I just wanted to – you sort of didn't finish the story, so I was wondering if you wanted an opportunity to …?

MS. BENEFIEL: I – there's been so much, remind me; what –?

MS. URQUHART: It's something about if he was gonna put up a sign at the end – at the mouth to –

MS. BENEFIEL: Oh yes, I said: are you gonna put up a sign at the mouth of the river and tell the fish that they can't go any further.

MS. URQUHART: And do you remember when that was?

MS. BENEFIEL: I think that was during the hearings.

MS. URQUHART: During the hearings.

MS. BENEFIEL: Yeah.

MS. URQUHART: Okay.

MS. BENEFIEL: So there's probably a transcript of that.

MS. URQUHART: I suspect there is. Anyhow, I just wanted to give you a chance to finish that story up.

And I actually wanted – excuse me – I wonder if we can go to the paper please, just at page 48, paragraph 194. And I just – I'm very cognizant, and I think you are as well, that this is – the Grand Riverkeeper is an organization that has many members and that is really a citizens' group, and so I wanted to – I wondered if you might read into the record the comments there that wildlife biologist Stu Luttich had made in the course of the hearings.

I think it's – it just really talks a bit about the sort of cumulative effects. Do you have it there?

MS. BENEFIEL: (Inaudible.)

MS. URQUHART: Page 48 at the top?

MS. BENEFIEL: The bottom page 48, on the bottom?

MS. URQUHART: No, at the top it should be 48, paragraph 194?

MS. BENEFIEL: This is about the impact on the caribou.

MS. URQUHART: Yes, yeah, do you want – do you mind just reading that, what Mr. Luttich said, into the record?

MS. BENEFIEL: I'm sorry I didn't hear you.

MS. URQUHART: Do you mind just reading that into the record, just read out what he said?

MS. BENEFIEL: Just 194?

MS. URQUHART: Yeah.

MS. BENEFIEL: Okay.

"Mr. Luttich described the synergistic effects of projects in the north as a sort of momentum: as roads are built, as electricity finds its way into the far reaches of the province, more and more area is opened up for development."

"He continues: 'The impact upon the caribou, that is currently thought negligible, is only

adding a brick into the road that can and will have far greater dramatic impact upon the Red Wine caribou, the George River caribou, and the caribou resources of the Labrador Ungava Peninsula as we currently understand those resources to exist.

"'Most changes are permanent and irrevocable within the context of contemporary human history and as explained only lead to more changes of the similar nature. Impossible as it might appear today but one can still imagine the entire Labrador Ungava peninsula becoming laced with an interlocking network of roads.'"

And I'd like to add to that that if anyone was to travel around Labrador, up the Trans-Labrador Highway and into the areas that are – have been worked on, there are roads everywhere. I've never seen so many roads built and pushed into the wilderness. They're all over the place. It's going to really be an expensive process to stop people from actually getting in there and using those roads.

The caribou and any other wildlife are just open and endangered; and by the way, years ago when we started talking about this, of the wildlife officers in the province, we had 10 per cent, we now have one person. So, that's my understanding that all of the wildlife officers in Labrador were laid off, and we have one person to look out to all that and to monitor people hunting and fishing in the lakes that those roads go by, and hunting caribou and whatever. So.

MS. URQUHART: And, I just wanted to touch on – and you actually spoke a bit about this just a moment ago with Mr. Hogan – about the composition of Grand Riverkeeper and that it's a volunteer organization, and just a bit about, sort of the time and energy – I'm talking specifically about leading up to the sanctioning process – that folks put into this process.

Just if you can, kind of describe a little bit, you know – were you at all the hearings, some of the hearings?

MS. BENEFIEL: During the actual hearings, I think I might have missed two days and that was only because I was writing a paper for the next day, so – but every day some members of Grand Riverkeeper were at those hearings. Every single day.

We did a total of about 18 presentations and we looked at presentations by other people and we figured at the end that probably about 65 different presentations were attributable to our members and so, you know, at the end of the whole process, like I said, the chair, the co-chair, Leslie Griffiths made a little comment about us and said, you know, I don't remember the comment offhand, but I think I did put it in somewhere – and she said: you folks have done so much work with so little, it's just amazing.

And, you know, we thanked her for that. And we did, but we did it because it's our river. It's the same reason why people here in Newfoundland are now concerned about this project, because it's going to affect their rates. Suddenly it's a personal thing, but it's been a personal thing for us for 20 years.

MS. URQUHART: And, just in terms of that, that history of involvement, so you're talking about 20 years; I know you once told me that you made your first presentation on this in 1998.

MS. BENEFIEL: I did.

MS. URQUHART: So, it's been a long –

MS. BENEFIEL: In university –

MS. URQUHART: – it's been a long –

MS. BENEFIEL: – when I didn't even know how to operate a computer, and I made a PowerPoint presentation. Oh, the words that I had to use to get that PowerPoint to work.

MS. URQUHART: And, so one of the things that I also want to draw folk's attention to, and partly for the public record, was the documentary.

MS. BENEFIEL: Mm-hmm.

MS. URQUHART: Can you tell me just a little bit about how that came to be?

MS. BENEFIEL: The documentary?

So, it's called – it's on our website in two parts, and if people want to have a look at the upstream part of the river, its actually the most beautiful part of the river starting at Gull Island – not Gull Island, starting at Muskrat Falls – ah, Churchill Falls – too many words. We paddle down, and it takes us about eight to 10 days depending on the time you take in the evening and how fast your wanna get out on the water in the morning.

So, we had – once we were accepted as a Riverkeeper in 2005, we got a phone call again from Daniel LeBlanc and he said I wanna put you in touch with Dr. Brenda Beck and Eric Harris. They own – they were both CBC employees, I think, for a while. Dr. Beck actually – no, Eric Harris was CBC, and he was retired. Dr. Beck was a professor. And, they have a company they call the Sophia Hilton Foundation and they'd like to come down the river with you and do a documentary.

So, that year we – in August I believe it was – they joined us and we paddled the river and they reviewed – or they did video on the entire river system. And that was the year that Jim and I took our first dip in Devil's Hole, so we became marine members of the Grand Riverkeeper group that year. We both went in the hole and tipped our canoe over simply because Jim decided he had to get into the white water at the Devil's Hole.

MS. URQUHART: And so following that – so that was in 2005, and then in 2006 GRK also was involved in the Energy Plan in providing more –

MS. BENEFIEL: Yeah.

MS. URQUHART: – input into the Energy Plan, is that correct?

MS. BENEFIEL: Right.

MS. URQUHART: Yup.

MS. BENEFIEL: Right. We did a presentation to Ed Byrne, I believe that was his name.

MS. URQUHART: Mm-hmm, yeah.

MS. BENEFIEL: And again we pointed out that this is not a run-of-river project, and that there were so many different issues with this project that it shouldn't go ahead.

MS. URQUHART: And, you know, in – through the course of all this you also – GRK was also preparing press releases and attending, you know, information sessions. You mentioned some of the sessions that you held in Mud Lake and North West River, but there were a number of other –

MS. BENEFIEL: Right.

MS. URQUHART: – sessions and meetings and you're keeping involved with –

MS. BENEFIEL: Right, yes.

MS. URQUHART: – with the community in that – in those ways.

And I just wanted to actually turn to what is Exhibit 00373, please? I believe it's page 51. I don't know, Roberta, if you have that in yours. It'll come up on the screen there, if you don't. It's from Robin Goodfellow-Baikie's submissions.

THE COMMISSIONER: Tab 18. Tab –

MS. BENEFIEL: There's a –

THE COMMISSIONER: It's – also you can get it at tab 18 – 373, right?

MS. URQUHART: Correct.

MS. BENEFIEL: Three-seven-two?

MS. URQUHART: Seven-three, so it'll be your tab –

MS. BENEFIEL: Oh 7-3 okay.

MS. URQUHART: – your tab 18.

MS. BENEFIEL: So that's the Dick Budgell story?

MS. URQUHART: So at the very bottom, on page 50 I believe it is.

So this is a press release from 20 – February 9, 2011. This actually came from Todd – then-MP Todd Russell – who through his constituency office had circulated an opinion survey to folks in that area – region of Labrador, and we heard yesterday that at the time of sanction, 80 per cent of those surveyed indicated that they were – this is in a different survey which I didn't have the cite for – but were in favour of it –

MS. BENEFIEL: Mm-hmm.

MS. URQUHART: – and this was a survey of Labradorians. And so I just wanted to bring attention to this question 2 there, can you see – do you wanna – do you mind reading that out?

Can you see it there? It's Q2 –

MS. BENEFIEL: "Are you concerned about the environmental impacts of the proposed Muskrat Falls Project?"

MS. URQUHART: Mm-hmm.

MS. BENEFIEL: Seventy-eight per cent yes – said yes. By the way, this was a – this – there was over 2,000 people that got involved in this. This was a virtual town meeting –

MS. URQUHART: Mm-hmm.

MS. BENEFIEL: – on phone calls and – I was involved in it of course and –

MS. URQUHART: Mm-hmm.

MS. BENEFIEL: – obviously, 1,999 others. Yeah, so, 78 per cent said they were concerned about the environmental impacts. This was just Labrador, only.

MS. URQUHART: Yeah.

MS: BENEFIEL: Okay?

MS. URQUHART: And I mean, I think if we just – the one even above that. So: "Does the proposed Muskrat Falls development provide enough benefit to the people of Labrador?"

MS: BENEFIEL: Eighty-three per cent said no.

MS. URQUHART: Yup.

So I just wanted to give as a – to bring that to the attention of the Commission and of the public as that was one of the documents that a member of the Grand Riverkeeper had submitted –

MS: BENEFIEL: Right.

MS. URQUHART: – and obviously that is part of – put that into the public record that there was certainly significant concerns from residents –

MS: BENEFIEL: Exactly.

MS. URQUHART: – in Labrador.

And I just wanted to ask you a final question, is there anything else that you'd like to clarify – is there anything that you want to expand upon before we –?

MS: BENEFIEL: I think I want to say thank you to the Commission, to the Judge, and to all of you. I can't imagine how you learned as much as you've learned in the few months that you've had to go through this. It took me nine weeks to dig out this information – this little bit. And this is about a third of – probably of what there is of our involvement.
There's just no way to pull it all together, so thank you for knowing so much about it and for this Inquiry.

And to say that, you know, we sent a message to Dwight Ball – we sent a petition to Dwight Ball. We've stood at the Co-op and the North Mart – which by the way has had a fire, and so we can't stand there anymore, but – and various people, and I'll ask – we had a question, they said you know, do you think that there should be a Commission of Inquiry into the Muskrat Falls Project and we had a thousand signatures.

And we sent those in and they were presented by the NDP member at the time in the House of Commons. House of Commons or the House – yeah?

UNIDENTIFIED MALE SPEAKER: Assembly.

MS. URQUHART: Assembly.

THE COMMISSIONER: House of Assembly.

MS. URQUHART: The House of Assembly.

MS: BENEFIEL: The House of Assembly – the House of Commons isn't –

MS. URQUHART: Right.

MS: BENEFIEL: Of all the times I've been involved with this, you'd think I'd know that.

But a thousand people just walking by with their groceries reading that little sign that said, do you think that the Muskrat Falls should have a judicial inquiry? And they said yes; and it's here. So I think we had a little part in bringing this forward and I wanna say thank you to all of you and I appreciate it.

THE COMMISSIONER: Okay.

All right, thank you very much, Ms. Benefiel, I appreciate that.

Ms. O'Brien?

MS. O'BRIEN: Our next witness is Philip Raphals. He is present, so if you'd like we can start with him.

THE COMMISSIONER: Okay.

Philip Raphals.

MS. BENEFIEL: Do I leave these?

THE COMMISSIONER: Just leave those there, that's fine for now.

UNIDENTIFIED FEMALE VOICE: Here, can we switch places?

THE COMMISSIONER: Take those binders.

UNIDENTIFIED FEMALE VOICE: I'll take that with me, okay. Then we gotta go.

THE COMMISSIONER: (Inaudible.)

UNIDENTIFIED MALE VOICE: I'll get those for you.

MS. O'BRIEN: I have not yet canvassed with the witness, whether he prefers to be sworn or affirmed.

THE COMMISSIONER: Okay, Mr. Raphals, just stand up if you would please.

MR. RAPHALS: Yup.

THE COMMISSIONER: You can either provide your evidence under oath, by swearing an oath, or alternatively you can affirm to tell the truth. Either one is equally acceptable; which do you wish to do?

MR. RAPHALS: I prefer to affirm.

THE COMMISSIONER: Okay.

CLERK: Affirm?

MR. RAPHALS: Yup.

CLERK: Okay.

Do you solemnly affirm that the evidence you shall give to this Inquiry shall be the truth, the whole truth and nothing but the truth?

MR. RAPHALS: Yes I do.

CLERK: Please state your name for the record.

MR. RAPHALS: Philip Raphals.

CLERK: Thank you.

THE COMMISSIONER: You can be seated, Sir.

Ms. O'Brien.

MS. O'BRIEN: Thank you.

Mr. Raphals, before we begin, I'm just going to give a little introduction to you; and that you have previously been retained by the Grand Riverkeeper group, whom we just heard from, and by other groups. And you have given testimony before in other proceedings related to Muskrat Falls, and that's primarily what you're here to testify to today, particularly those presentations that you gave prior to the sanction of Muskrat Falls.

So before we get into that though, I'm going to ask you to review a little bit about your background, your work history; and to assist you

in this, at Exhibit P-00353 and at tab 1 in the book before you, Mr. Raphals, is a copy of your CV. This has been filed as an exhibit – or excuse me, I forgot to ask for my order for Exhibits to be filed, Commissioner. I'm looking to file Exhibits P-00353 to P-00370, and P-00380 to P-00381.

THE COMMISSIONER: All right, those will be entered as numbered.

MS. O'BRIEN: Okay, thank you.

Now, it's been filed as an exhibit, Mr. Raphals. So, you can have reference to that – it is filed, so all that information is before the record, so I'd just get you to highlight the most relevant sections.

MR. RAPHALS: Sure, thank you.

Good morning.

THE COMMISSIONER: Good morning.

MR. RAPHALS: It's a pleasure to be here.

THE COMMISSIONER: It's actually – we just turned afternoon so, we're getting there.

MR. RAPHALS: I'm the executive director of the Helios Centre, which is a non-profit energy consulting – research and consulting group based in Montreal. We just completed 20 years – actually we're in our 21st year; we founded in 1997. A great deal of our work is – and of my work – is about participating in regulatory proceedings about energy. Basically with a concept of trying to help decision-makers get to the right decisions; to the wisest decisions.

So in that context over the last, let's say over the last 10 – well, 15 years, I've been an expert witness in quite a number of proceedings under – for different tribunals. So just to, very quickly review that on the first page, if you could scroll down on this page, to the bottom of the page.

At the Régie de l'énergie, which is the Quebec energy board, I've actually been – participated in – from their very first hearing – they were created in 1997 – and have appeared as an expert witness in quite a number of proceedings, including transmission tariffs – Open Access Transmission Tariffs in particular; conformity with FERC; the very complicated relationships between the divisions HQ Production and HQ Distribution, which are roughly analogous to Nalcor and NLH. And on the next page, issues about the balancing contract for wind energy, issues about security of supply, energy efficiency, and many other issues that came up over the years.

I've also had the pleasure of testifying before the Newfoundland and Labrador PUB on a number of occasions. First, on behalf of Grand Riverkeeper in the Muskrat Falls Inquiry. But since then I was engaged by Innu Nation to be their expert in the proceeding on the amended general rate application of NLH in 2013. That was then amended, but it was essentially the same proceeding.

And then there's a current rate application, where I am the – I've been retained as an expert by the Labrador Interconnected Group, which is in reality an association of the – of most of the municipalities of Labrador. So it's Happy Valley-Goose Bay, Lab City, Wabush and Sheshatshiu. And that's a rate proceeding, but there are also been quite a number of sub-issues that have arisen. There's like the capital budget application and a number of other proceedings.

I've also testified as an expert in Manitoba and BC. In Manitoba, just for the first time this past year on behalf of the Assembly of Manitoba Chiefs, in again, a rate proceeding, that was essentially a proceeding to deal with the rate impacts resulting from the past developments, which are now – which have led to proposals to increase rates of about, of about – by about eight – more than 8 per cent for each of four years. Which was seen as a very drastic rate increase.

And then British Columbia, which actually has a lot of parallels to this province, I was the expert for the Treaty 8 Tribal Council – Tribal Association, sorry, in the environmental assessment of the Site C project. It was – like here, it was a joint federal/provincial review panel in 2013 and 2014. Site C is larger than Muskrat Falls. It's 1,100 megawatts, but it's also similar in that it's downstream from an even bigger dam, the Peace River Dam, on the Peace River.

And, Site C has been a fascinating story. The – like here, the environmental assessment produced many recommendations, many comments. The project was approved and construction began, but then there was a change of government, and after – with the change of government came a call for – the new government called upon the BC Utilities Commission to carry out a review of the project while it was under construction, essentially to determine if the point of no return had been passed, and if so – if not, sorry – if it has not been passed, then is it – is the best choice to continue forward or is the best choice to stop the project.

And, together with colleagues from the University of British Columbia, and Rick Hendriks of Camerado Energy, we produced a number of submissions in this process and were very actively involved in the BC usage review of Site C.

I don't know if you want me to go back to the past, and sort of tell you how I got here, or if you want to move on. It's a –

MS. O'BRIEN: No, that's fine.

If you could just review what your education credentials – you've talked a fair bit about your work experience.

MR. RAPHALS: Yeah.

MS. O'BRIEN: What was your background prior to then?

MR. RAPHALS: My educational background, right, doesn't have very much to do with the work that I do today. I have a bachelor's degree, cum laude in philosophy from Yale University and I have a master's degree in music from Boston University, in performance. I'm a cellist and was a – worked as a performing cellist for about 15 years before a career shift that took me through science journalism, and eventually through a circuitous path into the world of energy policy where I've been working for the last 25 years.

MS. O'BRIEN: Okay.

So, your expertise in this area has been gained through, essentially, work experience.

MR. RAPHALS: Yeah.

MS. O'BRIEN: Okay.

Thank you.

Okay, so we're gonna go through some of the work that you did. There's three – as we go through the evidence there's going to be three main bodies of work that we will be referring to – and I just want to get you to confirm those now – for the Joint Review Panel that we've had a fair bit of evidence about already, I understand that you were engaged by the Grand Riverkeeper and you made presentations before the Joint Review Panel.

MR. RAPHALS: That's right.

MS. O'BRIEN: Okay.

And also, with respect to the environmental assessment of the Labrador-Island Link – which did not go through the same hearing process as did the generation facility, but there was still a process involved with that. And I understand you are also engaged by the Grand Riverkeeper to present for that process.

MR. RAPHALS: Right, a written report.

MS. O'BRIEN: A written report, yes. Thank you.

And finally, I understand that you also appeared before the PUB on the reference question for the Muskrat Falls Project.

MR. RAPHALS: That's right.

MS. O'BRIEN: And was that also an engagement for the Grand Riverkeeper?

MR. RAPHALS: It was a pro bono engagement for Grand Riverkeeper.

MS. O'BRIEN: Okay, thank you.

Okay.

So with respect to the work that you did before the Joint Review Panel, I understand that the work that you did primarily was in relation to what ultimately became three recommendations of the Joint Review Panel; is that accurate?

MR. RAPHALS: Yes, that's right.

MS. O'BRIEN: Okay, and just for the purpose of framing your evidence, I think it might be helpful to identify those. Could we please bring up Exhibit P-00041 and go to page 40 – or 59 – and this is at tab 2 of your binder, Mr. Raphals.

MR. RAPHALS: I only have the title page in tab 2 of my binder.

MS. O'BRIEN: Okay, it will appear on your screen.

MR. RAPHALS: Mm-hmm.

MS. O'BRIEN: So I understand that this – what we have here on this page is a conclusion, here, from the Joint Review Panel. And this had to do with – they concluded that there had not been a justification of the project as a whole in energy and economic terms.

And there was some outstanding questions regarding both projects and that led to their recommendation number 4 regarding the recommendation that government confirm the projected long-term returns for the project.

MR. RAPHALS: Oh yeah, recommendation 4.1.

MS. O'BRIEN: Sorry, 4.1. My apologies, yes.

And we've seen that one before; and again, I understand that page 68 – the other recommendation that you had some related input to was recommendation 4.2, and above it is the conclusion that the panel drew in relation to that recommendation. But ultimately, that recommendation 4.2 was for an independent analysis of all alternatives to meet a domestic demand. So is that the –

MR. RAPHALS: Well yes, so the finding – the conclusion was that the – Nalcor's analysis that showed Muskrat Falls to be the best and least-cost way to meet demand requirements is inadequate. It's really quite a strong finding. And that an independent analysis of these considerations of alternatives is required. This, by the way, if I may say, this is one of the central elements of the judicial review application to the federal court that Ms. Benefiel spoke about earlier. Whether or not the panel, in fact, should have answered these questions rather than deferring them.

So, recommendation 4.2 is actually quite long and I don't think we need –

MS. O'BRIEN: No, that's fine. It's entered into evidence and we've already had some evidence with respect to it. And finally, I just want to draw the – that the third recommendation is found on page 69.

And this is recommendation 4.3 having to do with Integrated Resource Planning.

MR. RAPHALS: That's right.

MS. O'BRIEN: And that's another area you gave a fair amount of testimony on. Okay, thank you.

Commissioner, I note we're at 12:30 now. I've gone through Mr. Raphals introduction. I can get into his more substantive questions, or we can break for lunch now.

THE COMMISSIONER: Okay, is this a good spot to break?

MS. O'BRIEN: It is.

THE COMMISSIONER: Okay, so we'll break now and come back at 2 o'clock, then. So, we'll be back at 2 o'clock, Sir.

MS. O'BRIEN: Thank you.

CLERK: All rise.

Recess

CLERK: This Commission of Inquiry is now in session.

Please be seated.

THE COMMISSIONER: Right, good afternoon.

Ms. O'Brien.

MS. O'BRIEN: Thank you, Commissioner.

I'd like to bring up Exhibit P-00354, and Mr. Raphals that is in tab 3 of the books before you, and this is one of the submissions that you made in relation to the JRP. And I'm gonna ask if we could go to page 5 of the exhibit?

So, in this one of the concerns that you raised in this section here entitled: Project justification, you raised a concern that Nalcor's justification for the project was circular.

Can you please explain what your concern was in that regard?

MR. RAPHALS: Yes, of course.

As you can see here – well, I believe that Nalcor had described part of the justification of the project as being to develop the hydro power resource of the whole Churchill River, and that's quoted here in response to JRP.26. And then 26S, which was a supplementary request from the panel, they responded – they explained that what they meant is that – this is the quote in the second block of quote: "Construction of a single dam at Gull Island, or in other words not constructing the Muskrat Falls … site, would not meet the stated purpose of the project, which is to develop the hydroelectric potential of the Churchill River."

What I pointed out in my paper is that this is essentially says that the justification for the project is to build the project. And then if you ask the question: How can the purpose be met without the project? It becomes impossible to answer it. So any review of alternatives becomes completely irrelevant. And so my recommendation to the panel then was to ignore this element of the claimed rationale or justification for the project.

And they, in fact, accepted that recommendation, although they did it rather subtly. It's not stated as a conclusion, but – I don't have the page in front of me, but in the report when they talk about this issue, and there's a paragraph where they say: Therefore, we understand the justification of the project to be, and they list three elements and they don't mention this one. So they did, in effect, withdraw this notion that the purpose of the project was to develop the resource.

MS. O'BRIEN: Thank you.

Another concern that you raised before the JRP, and as well as some of the other proceedings, had to do with rate impacts. I'm going to ask you to explain the concern that you were raising to the Commissioner and also to the extent that further information has come to light since you made those presentations, if that effects what your concern is. If you could please bring that to our attention.

And I understand the best of your submissions to address this would be exhibit P-00363 and this was the written submission you made on the environmental assessment for the Labrador-Island Link. And if we could go to page 37 and that I believe is in tab 12 of your book, Mr. Raphals, page 37.

So, there it is on the screen in front of you.

MR. RAPHALS: Yes. I don't think that's the right spot, is it? We want to talk about the rate impacts.

MS. O'BRIEN: Yes. Oh, if there's another place to go, please say.

MR. RAPHALS: Well, yeah, because the power purchase expenses – oh no, excuse me, you're absolutely right, pardon.

MS. O'BRIEN: Okay.

MR. RAPHALS: So, this is a question that I first raised in the initial, in my initial paper, but more in the line of questioning because it wasn't at all clear how ratepayers would end up paying for the Muskrat Falls Project and, at the time, it seems that what Nalcor was alluding to was some kind of a Power Purchase Agreement arrangement but it wasn't at all clear.

So, then overtime, it gradually has become fleshed out and became very clear to the point

where now there is a Power Purchase Agreement that we can perhaps look at later.

So, in this report, which was for the environmental assessment of the Labrador-Island Link and, therefore, a year later, we're in June 2012, I tried to summarize where, you know, what we know about this issue. And so what it comes down to is that the – historically, the way that large hydro projects have always been developed is in the context of cost-of-service regulation, which was I think explained yesterday to a certain extent.

So the idea is that a regulated utility has a rate base, which is to say the assets that it is invested in, and each year it has costs related to those assets. Those costs are operations and maintenance but they're also the capital costs. They're that years share of the interest costs and also of the equity costs, which are usually grouped together in a cost of capital.

So, over time, as the asset gets depreciated and as the loans get paid off, that capital cost goes down, which is why we think of large hydro power as a very low-cost resource because we look around us and we see the Upper Churchill, we see Bay d'Espoir, we see James Bay and these resources all produce power for less than a cent a kilowatt hour, but the reason is because when they were new they were much more expensive, especially in dollars of the day. And as time has gone on and their capital costs have diminished, we're left really with the operating costs, which are very low.

So, the approach that Nalcor has taken Muskrat Falls is very different from that. It's an approach that's much more similar to the nature of a purchase from an independent power producer, so most of the wind development that's gone on around North America – it's not utilities that are building wind power, it's private companies. And they have contracts.

They have their own internal way of dealing with their loans and their equity, but as far the utility's concerned, it's simply a contract about how much they're gonna get paid per kilowatt hour. And these contracts are usually based on escalating price that approximates a constant real value. So – and it gets very nuanced and it's not the – the escalation is not always precisely inflation. But you can have a resource, for instance, that costs 5 cents a kilowatt hour in the first year, and it goes up by 2 per cent every year. And – so, this is a normal arrangement for Power Purchase Agreements, but it's very surprising to use that for a megaproject. And it has a great significant in terms of rate impacts.

Under cost-of-service treatment, rate impacts are biggest at the beginning and become very small over time. Under Power Purchase Agreement, they're much smaller at the beginning, but increase over time. And so, with the PPA approach, you don't have the effect where 40 years from now Muskrat power – Muskrat Falls power will be cheap. In fact, in 4 years, Muskrat Falls power will be extremely expensive because it's gonna keep increasing by 2 per cent per year until 2067.

And on the last page of this document –

MS. O'BRIEN: Yes, if we could go to the final page, please, page 44.

MR. RAPHALS: Yeah, page 44.

So – I don't think we have to work through all this, but the idea – this is a spreadsheet I prepared for the PUB reference hearing. And Nalcor had published the year-by-year costs of both the generation and transmission combined. But their proposal is to handle transmission costs based on cost of service, so the costs go down. So what I've done here is separate out their figure, which is column 5, so that's the total annual cost in millions of dollars of generation and transmission.

So, you see, it starts at $239 million – thousands dollars – wait –

MS. O'BRIEN: Column 5?

MR. RAPHALS: Yeah, no. It's millions of dollars. That's a mistake. So in column 5 for 2017, it shows 239, and then the two yellow columns to the right of that separate out the part that's Muskrat Falls and the part that's the LITL. So since what we're interested in here is Muskrat Falls, we just looked at that left yellow column, which starts at 92 and grows to 247 by the very bottom of the column in 2067.

So this would be – and again, these are based on the assumptions of the day, which are no longer correct, that Muskrat Falls would have cost, globally, consumers $92 million in 2017, but $247 million in 2067. And then I tried to separate that out into a cents per kilowatt hour number – by the way, the yellow columns are mine, the white columns are Nalcor's.

And so column 7c gives an idea of that and – which starts at 5, 15, 22 cents per – sorry, dollars per megawatt hour – to convert from dollars per megawatt hour to cents per kilowatt hour you just divide by 10, so $15 per kilowatt hour is 1.5 cents per kilowatt hour – increasing all the way to 33.6 cents a kilowatt hour at the end.

Now, please don't take these numbers as cash, there's a – this is – there's a lot of information missing, and this is really meant to be the illustrative, but the underlying pattern that it illustrates is correct, which is that for the Muskrat Falls component, under the PPA, the amounts will grow dramatically overtime.

MS. O'BRIEN: But are they not growing consistent with inflation? The idea being that in, you know, the dollars of the day, in the future, it would be the effective same amount of money because –

MR. RAPHALS: Well, that –

MS. O'BRIEN: – the idea they're increasing with the pace of inflation, more or less?

MR. RAPHALS: That is true, but as citizens, as consumers, we don't really think about inflation very much. And if you think about the way most mortgages are structured – usually – a mortgage, you pay the same amount of dollars every year for the length of the mortgage. And it's true, in real dollars, it's getting smaller overtime. But if someone offered you a mortgage where every year your payments went up by 2 per cent, I think you'd think really hard about signing that.

It's not the way – I mean, the way economists think about real and nominal dollars is one thing, but the way in our lived lives we do is something else, and I think this idea is very current. And by the way, I could show you the passage from the PUB report, but the assumption is very widespread that, after time, hydro becomes cheap. It's only expensive at the beginning. And the question was asked by – I forget who – by the Consumer Advocate, perhaps. Maybe it's even worth going there. Can we look at the PUB –

MS. O'BRIEN: Yes, if that's helpful. The – your PUB –

MR. RAPHALS: – report?

MS. O'BRIEN: – submission is at P-00360, tab 9, in the book before you.

MR. RAPHALS: Tab 9 – thank you.

MS. O'BRIEN: Is there a particular page?

MR. RAPHALS: Just a second now. Yes, page 7. At the bottom of the page we're – a little higher, please – right there, yeah.

So I point out that traditional "hydro projects" – like I just said – "have been developed as ratebase projects under" cost of service, which is why Bay d'Espoir is now so low. If it had been build under a PPA, instead of a COS, it would cost far more today. And in the exchange I quoted earlier, which was between Mr. Bennett, I think, of the Consumer Advocate –

MS. O'BRIEN: Mr. Bennett, maybe, from Nalcor – Gilbert Bennett?

MR. RAPHALS: No, I don't think it is.

MS. O'BRIEN: Okay.

MR. RAPHALS: Anyways, it's not important who it is. But he said: "maybe, building onto that point, … customers in 2068 who have an asset that's, whose cost are fully recoverable have a similar situation as we've seen in Bay d'Espoir."

And then according to the transcript, the chair said, I can't wait – referring to the expectation that eventually Muskrat Falls costs would be as low as that of Bay d'Espoir. But as I've pointed out, then you'll be disappointed, because that's not the way that economics are set up.

MS. O'BRIEN: Thank you.

Another issue that you raised –

MR. RAPHALS: I'm sorry, before we go on –

MS. O'BRIEN: Yes?

MR. RAPHALS: – could we look at the PPA itself? I think it's tab 22 – 21 – tab 22.

MS. O'BRIEN: Do you have the Exhibit number?

MR. RAPHALS: P-00381.

MS. O'BRIEN: Thank you. Madam Clerk?

MR. RAPHALS: So if – on page 9, please?

So these are the actual tentative dollar amounts that NLH will have to pay to the Muskrat Falls Corporation for the energy from Muskrat Falls. I say tentative because it's my understanding that these costs will be revised, on commissioning, based on the actual final cost. So I think we can expect they will be substantially higher.

So you can ignore the first year, which is a partial year, but if you look at year two, the payment is $148 million. And if we just jump ahead to the next page – top of the next page – in year 18 is $337 million. And by the end, on the next page, year 51 – it's – year 50, it's almost a billion dollars.

Now, these are amounts that are fixed. So whether inflation is more or less, these amounts are contractual. And I've looked a lot of hydro projects, and I've never seen this kind of a structure, and I think the implications for future electric rates are quite substantial.

MS. O'BRIEN: Okay. Thank you.

Another issue that you've raised is the profitability of sales of residual energy, which is the same thing as export sales, as I understand it –

MR. RAPHALS: Yeah.

MS. O'BRIEN: – and I'm gonna ask you to explain what your concern was.

And again, if further information has come to light since you gave these submissions that impacts on what your concern was, please let us know that.

If we could please bring up Exhibit P-00354, tab 3 of the book before you, and page 13, I believe, was the reference.

MR. RAPHALS: Yeah.

So we should keep in mind that this environmental assessment was not solely on the Muskrat Falls Project, even though we sort of all knew that it really was. But formally, it was on the Lower Churchill Project, which included Gull Island as well.

MS. O'BRIEN: Okay, and this is – I should have said at the beginning, but this is one of your submissions we're – on – to the JRP (inaudible).

MR. RAPHALS: Yeah, this is my original submission to the JRP.

And obviously, a big part of the justification of Gull Island was gonna be export sales. It was really, primarily, for export sales, which is why I wrote in the middle of this first paragraph: "As initially presented, the justification of the Lower Churchill Project was essentially that of a merchant power plant."

Merchant power plant is a term that means a power plant for which all the power is to be sold into the market without any contracts in place to take its power when it's in service. It didn't exist 20 years ago, but – I don't know, maybe 30 years ago – but in early 2000s – since the early 2000s in the US, most – a large number of generators are merchant plants.

But again, large hydro as a merchant plant is a relatively new concept. Hydro-Québec is in fact doing it. Not with a lot of success in my mind, but anyway …

So the initial concept of the Lower Churchill Project was as a merchant plant, where we're gonna invest all this money, build these dams, and sell the power into these very lucrative markets and make lots of money, even though

there is no long-term power purchase agreement to take that power.

So in the next paragraph we see that the – in the initial concept it was expected there would be two terawatt – now we're in the Muskrat Falls world – there would be two terawatt hours a year of power for sale to the Maritimes or New England.

And the next paragraph, next page: "Over and above the generation cost, Nalcor will also have to pay transmission charges in Nova Scotia and New Brunswick, as well as the relevant import charges into the New England system. While these "pancaked" transmission charges have not been specified, it seems clear that Nalcor's break-even point for sales in New England, during the early years after project commissioning, will be over 15¢/kWh. If the Canadian dollar continues to appreciate against the US dollar, the break-even point would be even higher."

And "Given current market conditions," – this is current in 2011 – "it is difficult to imagine seeing such prices on a sustained basis. As we shall see below, recent forecasts for the New England electricity market are similarly pessimistic over the long term."

And now seven years later I would have to say nothing has really changed.

MS. O'BRIEN: The 15 cents per kilowatt hour – how did you arrive at that number?

MR. RAPHALS: I can't tell you in detail, but there was – one of the hard things in the Environmental Assessment Process was try to get clear answers as to what the unit costs of Muskrat Falls were. And there were two numbers, as I recall, that were often quoted. One was 7.7 cents, which was a levelized figure, and the other was 14.3 cents, if I remember correctly. I never achieved full clarity as to what that was meant to refer to. But if you take the 7.7 cents, real, so that it's escalating with inflation, and add the transmission charges and losses, you'd probably get pretty close to 15 cents.

MS. O'BRIEN: So the effect of capital cost increases since this work was done, would that have any impact on that number?

MR. RAPHALS: Oh yes, of course, it would get much higher.

But I don't think there's any expectation today that export sales would be cost-effective on a merchant basis, in the sense of actually meeting the costs of developing Muskrat Falls. I think today the assumption is simply that there is some additional revenue to be produced, that will diminish the burden on Newfoundland ratepayers. And maybe this should be mentioned as well, as I understand the PPA, the full burden of project costs are on Newfoundland ratepayers.

And what we'd normally expect, is that if there are additional revenues, that would come off the top. I'm pretty sure – I can't quote you documents – but I'm pretty sure that the initial concept was that all of those export revenues would not be deducted from Hydro's obligations, but would essentially be additional gravy for the owner. It's possible that's changed since then. I can't be sure. But in any case, the amounts are relatively small because the market prices are so much lower than the actual cost price.

MS. O'BRIEN: Thank you.

MR. RAPHALS: So then to go on – I can just – we can jump ahead a few pages but –

MS. O'BRIEN: If you give the page number, Madam Clerk can take us there.

MR. RAPHALS: Yeah.

So I talk about price risk starting on page 16 and continuing on page 17. Quoting a section from – I believe from the – yeah, from one of Nalcor's responses, describing its options to control and mitigate market demand and price risk. Essentially talking about a portfolio sales strategy built on – based on building a sales portfolio comprised of long-, medium- and short-term sales to different customers in different markets.

And I believe that what they were referring to was the possibility of selling to New England or New York through the Quebec route, or to New England through the Anglo-Saxon route, the southern route. And that by mixing and

matching these markets, that some risk could be reduced.

But the Quebec regulatory decision – that I believe came out in May 2011 – that essentially confirmed Hydro-Québec's position that Nalcor had forfeited its reservation on the Quebec system by not confirming it in the right way at the right time, meant that that second transmission path through New York and New England was gone – or at least was limited to the current reservation available for recall power.

So the point simply being that this market diversity argument lost a lot of power at that point. But the much bigger point is simply that market price forecasts at that time didn't support the notion that there were significant revenues to be obtained from these.

And so on the next pages – you can go to page 18. There's a graph. These are the market price forecasts that Nalcor used from the firm PIRA. The purple line is the nominal dollars, and the green – dotted green line is in constant dollars. So the 2009 dollars, it showed prices going from $70 a megawatt hour up to a hundred by 2030.

I then compared those forecasts with two other forecasts – if you can jump to page 21, please, top of the page.

These are forecasts from a publicly available – most of these forecasts are not publicly available, but there's one that's done every two years, I think, for a consortium of American utilities that does make long-term forecasts. This is their forecast showing – also in 2009 dollars, which is somewhat lower than PIRA's – and if you go to the next graph at the top of page 22, this combines them. So the top line is PIRA's forecast for on-peak, and the dotted red line is the Synapse forecast for on-peak, so those two lines are comparable. So we see Synapse's forecast is a bit lower.

But of course the Muskrat Falls Project isn't a peaking project; we can decide when you wanna generate, so you'd have to assume that you're selling pretty much all the time, or perhaps even more off-peak if Newfoundland is gonna be using more power on-peak. So the average price is probably more relevant, which is the solid purple line in the middle, so which is again noticeably lower. And then I also compared it to another forecast that I had access to, which is at the bottom of this page, which is even lower.

So, there's more details that maybe aren't relevant, but certainly my evidence at the time was that – I mean, PIRA is a very respectable firm and I have nothing against them – but that their forecasts were on the high side compared to what I'd seen elsewhere.

MS. O'BRIEN: Thank you.

The next issue I'd like to take you to is conservation and demand management, or CDM, and you raised this issue before each of the bodies that you either gave oral evidence or written filings before, and I believe the best one to start you with is P-00060, which is a submission to the PUB. It's at tab 9 of your book, and if we could please go to page 10.

MR. RAPHALS: That's P-00360.

CLERK: Three-fifty?

MS. O'BRIEN: Three-sixty, yeah.

Okay, Mr. Raphals, please continue.

MR. RAPHALS: Yeah.

So I started out referring to the MHI study that was produced as part of the PUB reference. I think it's an exhibit here – P-00048, I believe, for volume 1. So this first quote, I believe, is from P-00048 where MHI explains its generic description of the generation planning process stating that: "Demand side management is treated as if it were generation, as it represents a reduction from the base load forecast. The economics of" – DSM – "programs should be evaluated to ensure that they make a positive contribution"

MS. O'BRIEN: So this is from the report that MHI filed before the PUB?

MR. RAPHALS: Exactly.

MS. O'BRIEN: Okay.

MR. RAPHALS: Yeah.

MS. O'BRIEN: Yes.

It is in evidence. I can't confirm the exhibit number at the moment, but –

MR. RAPHALS: Yeah.

MS. O'BRIEN: – thank you.

MR. RAPHALS: So essentially, they're saying, quite correctly, that the normal way that utilities plan is they make a load forecast, they make an estimate of their demand-side management reductions in both in – by the way, both in energy and capacity over the same planning period, and then they plan for the difference. They plan for the load forecast net of the DSM – or CDM, sorry. NLH doesn't do that.

The next quote, which is from section – so it's also from MHI but the second volume, which I think is – wait a minute, I'm not sure which exhibit. Anyway, it says: "It should be noted that the domestic forecast does not include any specific, exogenous adjustment for specific Conservation Demand Management … programs. The NLH method of capturing and estimating CDM effects is through the technological change variable contained in the regression equations."

And it then explains that the – this variable has a coefficient of minus 35.37, meaning that average domestic use is forecast to decline by 35.37 kilowatt hours per year over 20 years. I may as well just read a little more, 'cause it's …

So there are several problems with this approach. First, it assumes, for no good reason, that CDM progress is linear, gradual and inexorable. But more important, it assumes that it does not depend on utility actions.

And here I would say what they're describing – in other words, the fact that average consumption tends to go down over time is in most places a small component of CDM gains and is sometimes called trend-based – it's based on the fact that, for instance, you know, refrigerators get more efficient over time. Things happen on their own that do indeed lead to greater efficiency, and that is part of the reduction demand.

But in utilities that practice what MHI preached in the first paragraph, which I was – essentially, all of the other utilities I am familiar with. It's only a small part, because in fact, it's been known for a long time that utilities can affect demand quite significantly. The most well-known way is through subsidy programs where, for instance, they'll announce that if you buy a compact florescent or an LED lightbulb, they'll give you $2 back or something like that.

But there's a whole wide range of programs, and there's a whole world of design of those programs. In fact, Philippe Dunsky, who – with whom I co-founded the Helios Centre – has since left – his firm, Dunsky Energy Consulting, is one of the leading advisors to utilities on energy-efficiency program design.

So there's a whole world out there of utilities and non-utility actors working to find the best ways to increase the efficiency with which electricity is used. And the fact that NLH does not – at least in the planning at this time – did not make any future deduction for future CDM, I thought, and I still think, is a very grave flaw in this planning process.

And I was somewhat disappointed that MHI didn't point this out more vigorously. I mean, they did say it, but they didn't flag it as: we have a big problem here. I had, actually, the same reaction to the Grant Thornton report, which also mentioned it but didn't call it out as a significant problem.

But if you look at the difference between the lines before and after DSM in the planning of other utilities – BC Hydro, Hydro-Québec, FortisBC, pretty much any North American utility – there's a substantial gap between those lines. And so to be planning generation for the upper line, instead of the lower line, inevitably means you're going to be overbuilding. Unless you simply don't do anything CDM. I mean, that's the other possibility. But it's widely recognized that efficiency is – within certain limits, which are – there's a whole science of avoided costs and figuring out where those limits are. But within those limits, CDM is a much more cost-effective resource than any generation.

MS. O'BRIEN: I have a couple of other exhibits I wanted to take you to where you address this, just to see if there's anything additional on the point. The next would be P-00363. This would be your written submission on the environmental assessment for the Labrador-Island Link. It's at tab 12 of your book.

And Madam Clerk, could we please go to page 15?

And Mr. Raphals, just – if there's anything additional there that you wanna add on CDM, please do it if –

MR. RAPHALS: Okay.

MS. O'BRIEN: – you haven't had a chance already.

MR. RAPHALS: Actually, I think it would better just start in my original paper for the JRP, just because there are a few more graphs that –

MS. O'BRIEN: So that would be at P –

MR. RAPHALS: That's P-00354 –

MS. O'BRIEN: – 354?

MR. RAPHALS: – right?

MS. O'BRIEN: P-00354, please.

MR. RAPHALS: And –

MS. O'BRIEN: That's at tab 3 of your book. And is there a page number?

MR. RAPHALS: Sorry, I'm getting there.

Oh no, excuse me, I'm in the wrong place. It's in the – it's in P-00358.

MS. O'BRIEN: Okay, so that's your second submission to the JRP; it's at tab 7 of your book.

MR. RAPHALS: Exactly.

MS. O'BRIEN: And the reference I have is page 10 for where CDM is discussed in that paper.

MR. RAPHALS: Right. Right.

No, it actually starts on page 7.

MS. O'BRIEN: Okay.

MR. RAPHALS: But that's just introductory. So page 8, we have two graphs.

MS. O'BRIEN: Okay.

MR. RAPHALS: So the top graph, which is explained on the page before, shows actual energy savings reported by NLH and Newfoundland Power in their annual CDM reports to the PUB. So the blue bar is Newfoundland Power, and the green bar is NLH. So it shows in 2009, they saved almost three gigawatt hours and in 2010, collectively, about five.

So to put these figures into perspective, they should be compared to the targets that were set in the Five Year Joint Energy Conservation Plan, 2008 to 2013, which is shown here. So the purple line are the targets of the joint plan. The bars show what was accomplished, and there's supposed to be a burgundy bar for NLH, but I think it's too small to see. But the important thing is to see how much lower those bars are than the plan that'd been set a year before in 2008.

And so in other words, not only are the amounts small in absolute values, but they're small based on the companies own projections from a year or two earlier. And then if we go to the next graph on the top of the next page – now, those were in energy savings, this is in dollars. So I think we've heard – and maybe I cite it later – the argument that, well, the reason that CDM isn't included in planning is because it hasn't worked very well, so there's no real confidence it's going to work.

So I thought it was important to look at how much – whether in fact the money that had been planned to be spent was in fact spent.

MS. O'BRIEN: So this is not dollars saved?

MR. RAPHALS: No, this is millions of dollars of expenditure on CDM plans –

MS. O'BRIEN: I understand.

MR. RAPHALS: – or programs.

MS. O'BRIEN: Okay, thank you.

MR. RAPHALS: So again, NP and NLH are separate and the purple line is the plan. So again, the amount spent in 2008, 2009 and 2010 were very much less than what had been budgeted – or at least planned in the joint plan 2008 to 2013.

MS. O'BRIEN: And would that joint plan have been filed before the PUB's –?

MR. RAPHALS: I believe it was.

MS. O'BRIEN: Okay, thank you.

MR. RAPHALS: I think it was.

So then going on – further down on this page, please. "The Proponent reports that current CMD budgets account for just 0.75% of utility revenues, while acknowledging that, according to Marbek" – and Marbek was the consultant that had prepared a review of Hydro's – I think Hydro and Newfoundland Power's CDM potential –

MS. O'BRIEN: And just to be clear, that was done in 2008 and it has already been entered as an exhibit, Exhibit P-00246 –

MR. RAPHALS: Right.

MS. O'BRIEN: – for anyone who's –

MR. RAPHALS: Right.

MS. O'BRIEN: – interested. Okay.

MR. RAPHALS: So: "… according to Marbek, 1.5% is 'an appropriate level for a jurisdiction in the early stages of CDM planning.'" So, in fact, the Newfoundland utilities were 50 per cent behind the level that Marbek thought was appropriate for an early stage, and then Marbek also said that funding levels should normally ramp up to 3 per cent once more experience is gaged. But CDM – based on the same report, CDM budgets were only ramping up towards 1.5 per cent. So again, 50 per cent behind what was estimated to be a reasonable level.

And then on the next page is a comparison – here we're – these are in dollars per capita – dollar expenditures per capita on CDM program budgets. Where BC, you can see, is between $30 and $40; Manitoba, Quebec a little bit less; and Newfoundland and Labrador – it's not a very easy to read graph, but it's well under $10. So again, expenditures were very far behind the typical levels.

So now, maybe, is a better time to go back to the other document, P-00363.

MS. O'BRIEN: Okay. It's at tab 12 of your book –

MR. RAPHALS: All right.

MS. O'BRIEN: – and the reference I have is for page 15.

MR. RAPHALS: Yeah, we can go to page 16.

So again, the same graph that we just saw. And my comment was: "This is not particularly surprising: Most utilities perform … poorly when they first begin to pursue CDM savings. What is surprising is that, based on its admittedly poor performance in the first years of its CDM program, **NLH has chosen to exclude consideration of CDM savings as a resource in its 50-year power plan.** I am not aware of any other utility in North America that has so blatantly disregarded CDM as a resource."

Going on, the EIS talks – says that: "'As a *stand-alone option*, CDM is not a reliable alternative and cannot meet the long term electricity demands for … consumers in NL.'" Obviously, CDM is never a stand-alone option. And, I think we'll talk more later about planning and – there really aren't any stand-alone options. Everything happens together with other resources. But: "This has not prevented it from being a major component of the least-cost resource plan of virtually every utility in North America."

I think that's enough for now.

MS. O'BRIEN: In one of your papers you raised the issue of a conflict of interest between utilities and CDM. Can you just explain to the

Commissioner what your position was with respect to that concept?

MR. RAPHALS: Yeah.

There's a well-known conflict of interest in the sense that utilities are businesses that sell a product. The product they sell is electricity. And they spend a lot of effort, really, trying to sell their product. And so to ask a utility to spend money in order to convince people to buy less of its product is sort of counterintuitive. You know, if you talk to a shoe manufacturer and try to talk him – to get him to spend money getting people to buy fewer shoes, he'll look at you a little funny.

But at the same time, because utilities are essentially monopolies providing a public service under a regulated cost, what's important is minimizing the overall cost of providing that service to society. And once it has been demonstrated that the overall cost of meeting energy needs to society is less if efforts are made to reduce demand, then if they're not made it becomes incumbent on the utility to do that even though it sort of – in some ways – seems to contradict its fundamental business model.

However, in the last 10 or 15 years, I would say, another solution has arisen in some places to try to sidestep this problem, because the reality is that in most jurisdictions there is a tension. There are regulators trying to persuade utilities to invest more and to work harder to reduce demand. And utilities are trying, but sometimes not that wholeheartedly.

And I mean, despite – a great deal has been accomplished, but the solution that avoids that is to create an independent entity in charge of efficiency. Vermont was one of the leaders in this respect but Nova Scotia has followed. So in Nova Scotia today, I think, they call it EfficiencyOne – or at the beginning it was called the Nova Scotia energy efficiency agency. But it's an independent entity that's funded out of contributions from rates; whose sole mandate is to do whatever it can to reduce the demand for electricity – (inaudible) energy capacity.

MS. O'BRIEN: Thank you.

I believe we had some evidence on that yesterday as well.

The other few points that I noted that you'd raised in your submission that I'd like you to review is in one of the papers – I'm not – I won't take you to the exact spot. But you talk about cost-effective potential of CDM versus effective potential. So cost effective versus just effective potential of CDM. And I understand this concept has to do with you can invest a lot of money into CDM initiatives but if you're not getting the money back, in terms of energy saving, that's not an efficient spend of money. Can you explain that concept, please?

MR. RAPHALS: Yeah, I don't think those terms are – I used the terms of those a little bit differently.

First of all, energy efficiency programs are generally evaluated based on avoided cost. Avoided cost means what the utility saves if it has to supply one-kilowatt hour less or one kilowatt less of capacity. And it can get quite complicated evaluating what those avoided costs are, but it gives you a benchmark. And it's not that every single program has to fit within that benchmark but generally it's evaluated in the sense that the whole package of programs has to cost less than the avoided cost, otherwise go ahead and generate.

Now, of course, there's also externalities. Another great advantage of efficiency is that it doesn't involve greenhouse gases, or flooded land or anything else. So we should keep that in mind too.

But – so then the question is: At a given avoided cost, how much efficiency is there to be obtained? And it usually starts with, what they call, a potential study or a technical potential. Which is to say: Regardless of cost, what are the measures that could be used? What does each one cost on a per-kilowatt-hour basis? And that will include somethings that are very cheap such as public communications urging people to wear sweaters when it's really cold out, to changing light bulbs. But then it gets into more expensive measures such as improving insulation, changing windows, you know, which can be quite expensive, and all kinds of other things.

Again, with the cost identified but not limited by cost. So that's the technical potential.

Then there's what they call the cost-effective potential, which is the part of the technical potential that is less than the avoided cost. So, obviously, the avoided cost, the bigger the cost-effective potential. So, that essentially tells you the total amount of energy that could be saved cost-effectively.

But then you have to deal with the reality that not everyone does – we don't all behave like perfect economic actors. And so some people call it the achievable potential. What is it realistic to expect out of this cost-effective potential that will be achieved in one year, in two years, in five years, in 20 years?

So, there's these three notions of potential that are all interrelated, but – and a critical variable in this is the avoided cost. And the Marbek study, which was done, I think in 2008, used an avoided cost of 9.8 cents, if I recall correctly.

MS. O'BRIEN: So does that mean at that time they were looking at electricity costing 9.8 cents per kilowatt hour at that time?

MR. RAPHALS: Not exactly. It meant that they were looking – at that time, they judged that the last kilowatt hours to be produced by Hydro would cost Hydro 9.8 cents. And –

MS. O'BRIEN: When you say Hydro, you mean Newfoundland –

MR. RAPHALS: NLH, yeah.

MS. O'BRIEN: Yeah, okay. Thank you.

MR. RAPHALS: And presumably – I'm not really sure if this was the case then but I suspect it was – that would mean the operating cost of Holyrood. Because when Holyrood is not operating, the actual costs of the kilowatt hours are not very high because of the old hydro system. So, usually, it's the thermal plant on the margin that sets the avoided cost.

So now, of course, Holyrood costs a lot more to run. I think they're talking about – I have the number 15 cents in my mind. I'm not sure if it's the right number. I'm sure someone else can answer that; 13 or 14 or 15 cents. Which means that today, if you were to redo that potential study – well, first of all, the technical potential would change because there's new technologies. There's all kinds of new things that exist today that didn't exist 10 years ago. But, secondly, the cost-effective potential would be much higher even if it was the same world of technical potential because you can include so much more of it within your cost-effective potential because the avoided costs have gone so much higher.

So, I mentioned this at different times in papers, but that change in avoided cost very dramatically affects what the CBM potential is. So whatever Marbek said – and I absolutely have no reason to think it wasn't the right thing at the right time – at that time – inevitably those numbers would be substantially higher today.

MS. O'BRIEN: Okay.

MR. RAPHALS: And in 2011.

MS. O'BRIEN: Okay.

If that's – if you've completed giving your position with respect to CDM, or conservation and demand management, I'd then move on to load growth. Is that – does that work for you?

MR. RAPHALS: Yes.

MS. O'BRIEN: Okay. And this, I'm gonna bring up your JRP submission, P-00358, tab 7 of your book, and my note here is to go to page 6.

MR. RAPHALS: Yeah, it's P-00358?

MS. O'BRIEN: P-00358, which is in tab 7, and load growth at the bottom of page 6. I'll just – oh, P-00358, please. That's 00363 I think you have up. Okay, page 6, and that should be at the bottom of this page, here we go.

MR. RAPHALS: Yup.

So I started this out talking about the role of electric heating in NLH's load growth. We had seen evidence that the market share for electric heating had increased from 10 per cent in 1985 to over 60 per cent in 2011, I imagine it's higher today, and that given the stagnancy of population growth and industrial growth on the

Island, electric heating growth may be the primary driver for demand growth.

Now, in most parts of the world electric heating is not very common. In Quebec where I live it's exceedingly common, which is the result of policy efforts that were driven, first of all, by a very large surplus of power in the 1970s, but also by the notion that when hydro power is driving electric heating there's no real loss of efficiency.

So, if I can explain that, electric resistance heating by itself is efficient, which is to say that a kilowatt hour of electricity put into a baseboard heater produces very close to a kilowatt hour of heat. You know, you can describe it in BTUs or whatever, but there aren't really losses in that process. There are more efficient ways to heat now. A heat pump, which is like a refrigerator backwards, would heat the same space with half that amount of electricity. But as long as there's not inefficiencies in the generation of your electricity, electric heat is probably no worse than anything else.

However, if the electricity is generated in a thermal power plant, it's a whole different story because in a thermal power plant, which involves burning fuel, either driving a turbine or boiling water, which drives a turbine, not more than 35, or if you're lucky 40, it depends on the technology, but between 35 and 45 per cent of the energy in your fuel ends up as electricity. And the rest is dispersed to the environment as waste heat, either through the cooling system or through the chimney.

So, if you burn a gallon of heating oil in your house, you get pretty much all – or 95 per cent of the energy from that heating oil into your house. If you burn that gallon of heating oil in a power plant, and then use the electricity to run a resistance heater, you get about a third of it and you've thrown away the other two-thirds.

So, from a policy perspective, electric heating in a thermal system is a really bad idea. And many regions have policy measures in place to discourage electric heating in such thermal – when the power is thermally generated. Newfoundland and Labrador is one of them. For the diesel systems on the coast of Labrador and the Island, there are special rates which are dissuasive precisely to avoid – to try to encourage people not to use electricity for heat. In Northern Quebec it's the same thing.

So, I found it surprising when, back in 2011, that in this context where electric heating is growing dramatically and where there's apparently real concern over how to run the power system over the coming decades, that no efforts were made to encourage or to discourage electric heat and to encourage the alternatives.

One of the alternatives, obviously, is wood. I think it was mentioned yesterday. This is a province with a lot of woodstoves. If one had been, you know – I think an appropriate policy measure back before this debate even started would have been to say, you know, we're developing a real capacity problem. We got a problem that's due to the penetration of electric heat. We have a thermal – a largely thermal system or a system of an important part of which is thermal, and what can we do to slow this process down?

MS. O'BRIEN: When you talk about alternatives, you know, one of them being wood, that may make sense for people living in rural areas, but in a city it obviously would create wood smoke out your chimneys; it affects the quality of the air in a city. So, generally, you don't have a lot of people burning wood within cities.

MR. RAPHALS: Yeah.

MS. O'BRIEN: What other alternatives would there be? One we've heard much of is furnace oil and having a furnace.

Are there other alternatives that you would have been thinking of for this province?

MR. RAPHALS: I take your point about cities. I mean, there are very clean-burning woodstoves and pellet stoves, actually, is sort of more the way things are going.

But, no, in the urban environments, unfortunately, fossil fuels is pretty much the alternative to electric heat, which obviously has its own downsides, but if you are up against the wall with your electric system, it can be a better solution.

Again, if you're burning fossil fuels anyway in your power plant, it's much better to burn them at home.

MS. O'BRIEN: Okay, and the other just – the other piece of information that we've heard from Nalcor, and from others as well, is that one of the reasons why there was such an uptake of electric heat in this province was because of price stability. That, you know, fuel oil being more volatile and people often preferring stability in their electricity costs, that that was a big driver of the, you know, a high rate of conversion to electric heat, and then new builds being electric heat.

Can you comment on that?

MR. RAPHALS: Not really, except to point out that in terms of new builds, this is an issue that comes up, again, it's very generalized, the cheapest thing for a builder is to put in baseboard heaters, even though centralized heating systems are more – are usually more efficient, better controllable. So, you know, insofar as you're talking about new developers, there's a incentive, just a business incentive, to just go with the baseboard heat, whether or not it's societally a better solution.

MS. O'BRIEN: And does the pricing – the other piece of information that we've heard from Nalcor and from others as well is that the conversion of – to – from a lot of furnace homes to electric heat homes also had to do with the relative pricing between the two options; that oil was getting more expensive and electricity –

MR. RAPHALS: Yeah.

MS. O'BRIEN: – was cheaper. So can you comment on that or do you have any additional comment on that?

MR. RAPHALS: Well, I suspect that – I don't know, but I suspect that's true. Of course, over the next decade that's probably not gonna be true, as the price of electricity is gonna go up fairly dramatically with Muskrat Falls.

MS. O'BRIEN: Is there anything further with respect to load growth that you'd like to highlight before we move on to integrated resource planning?

MR. RAPHALS: No, I mean –

MS. O'BRIEN: It was mentioned also in your – in P-00363, which was your LIL submission, which is at tab 12, and my note there is at page 13.

MR. RAPHALS: There's some discussion there that I don't think I need to repeat here, but that – just about the relationship between the forecasts of load growth and population growth; population seems to be declining and loads increasing, which raises some questions.

But, no, I think it's better to go – if we start talking about integrated resource planning because load forecast is a key piece of that as well.

MS. O'BRIEN: Okay, thank you.

So, for integrated resource planning maybe we can go to P-00358, which is the JRP submission, it was your second JRP submission. It's at tab 7 of your book, and my reference is to page 4.

MR. RAPHALS: Right.

So, what is integrated resource planning? Maybe that's a good place to start. It's a word that we've been hearing a lot, which is a good thing.

It's really a collection of planning tools that were developed, I would say primarily in the 1980s, as a smarter way to do electric planning. Now, it's sort of the – I'm going to really oversimplify, but if you think about the history of electric planning, which started out with the idea that we're going to do load forecasts and we're going to build whatever we need to in order to serve it.

So the next improvement is what I talked about before, which you can call least-cost planning, which is to take into account before you make your building plan the amount that you're going to be able to save through whatever efforts you can make to reduce the demand for electricity. So then you're building not just for your gross-load forecast but for your net forecast, net-load forecast.

Integrated resource planning began as an attempt to take more seriously, I would say, two things.

One is the enormous uncertainties that are part of any long-term forecast. Now, I mean, we've heard everyone, I've heard several people here say, and obviously forecasts are uncertain, I think I heard Mr. Locke say that, you know, of course we're going to be wrong. I mean, it goes without saying that forecasts are going to be wrong. But the question is: Wrong by how much and how likely and what are you going to do if it's wrong too high or wrong too long? And so as long as you're just planning to a single line, you don't really have any control of that.

So an important step to improve the robustness of the resulting plans is to think about the uncertainties, take into account high forecasts and low forecasts, high load growth and low load growth forecasts, as well as high and low forecasts of market prices and of fuel prices and all the other variables. There are an enormous number of variables that go into electric planning. So to not throw away the uncertainties, but to try to find rigorous ways to handle them.

And the second major element is to also take into account externalities, meaning – now in our day, externalities have pretty much been reduced to greenhouse gas emissions. In practically all the literature, the only externality is greenhouse gas emissions, and it is a exceedingly important externality.

But nuclear waste is also an externality, lost ecosystems is an externality, disturbed landscapes from wind turbines is an externality. All these are ways in which the electricity generating world, and for that matter transmission, impacts on the lives of people.

MS. O'BRIEN: So these would be things that in the least-cost analysis, which is what I understand that Nalcor did when it selected the Muskrat Falls option, but those types of externalities were not included in that least-cost planning that they did, and you're saying they are included in an integrated resource plan.

MR. RAPHALS: Well, actually I would not characterize Nalcor's planning as least cost, precisely because it left out DSM, or CDM.

MS. O'BRIEN: Okay.

MR. RAPHALS: So it failed to take into account the reduction in future demand –

MS. O'BRIEN: Okay.

MR. RAPHALS: – onto the programs. So, unfortunately, I think they're really way back at the beginning of this process but –

MS. O'BRIEN: With that caveat though –

MR. RAPHALS: With that caveat I would –

MS. O'BRIEN: – it was –

MR. RAPHALS: – agree with your statement –

MS. O'BRIEN: – did I give –

MR. RAPHALS: – yes.

MS. O'BRIEN: – a correct summary of what your position is?

MR. RAPHALS: Yes.

MS. O'BRIEN: Okay, thank you.

MR. RAPHALS: But the part about integrating externalities in planning got very complicated. It's really a very hard thing to do, because you end up having to measure, you know, how many square metres of fish habitat to weigh against how many grams of CO_2 and how many dollars and it's an almost impossible problem.

A lot of very interesting work was done to solve it, and, unfortunately, most of that has sort of gone by the wayside. But – and so – but sort of in modern integrated resource planning, what I've observed is that environmental and other externalities are dealt with but just qualitatively; they're mentioned, they're kept track of, but the efforts to try to quantitatively, you know, meld them all into a single number have sort of passed by the wayside.

So then – so in this role, which really started in the 1980s, and picked up a lot of steam, it took a big hit in the 1990s because with the US Energy Policy Act of 1993 or '4, and the opening of the American system to competition, suddenly what used to be the subject of long-term planning became the subject of markets. Electricity

became a commodity and a lot of this careful planning kind of disappeared from the landscape in many places, not in all places. Some states continued to do integrated resource planning right through this period. Some provinces have begun to do it. I think British Columbia is really a leader in Canadian integrated resource planning. I know that Nova Scotia does IRPs as well.

But what I'm saying is the heart of the process is the idea that many scenarios have to be looked at; many interests have to be taken into account. And that the best way to do this is in some kind of a collaborate framework, working with stakeholders and exploring possible futures – if I can use that term – in terms of the external variables about load growth and about interest rates and about exchange rates and all those things that might happen and we don't know where they're going to go, on the one hand and the things that we can do as a utility, which is more or less aggressive CDM, and the choice of whether to build more of this – what combination of generating resources to build.

So maybe, I think, I'm getting too vague here. I'll try to be more specific. The way a process typically works is – and these processes are lead by utilities but, again, in collaboration with other stakeholders and, most importantly, making their own analytical resources available to the process.

I guess I should – to be simple and straightforward, I'll just talk about the BC process, which is one I know well. They do an IRP every five years. It used to be presented to the BC Utilities Commission, but now it's presented to the government. So the process essentially looks at a large number of portfolios, and by that – let's say scenarios and portfolios. It gets confusing to use these words, but if you think of scenarios as what the outside world – things that happened to us.

So for instance, a scenario would be the high-load-growth scenario as our – the most aggressive – well, first of all, the load forecast is not just a single line, but it's usually three lines: a medium forecast, a high and a low. So for any one of those forecasts – and then you have a scenario of market prices; you have a scenario of fuel prices, and – which leads to a year-by-year line of needs. What do we need besides what we have in one year, two year, three years, 10 years, 20 years, rarely past 20 years.

And then you also build a bank of what are your resources. We have this big hydro plant we can build; we have a number of wind possibilities; there's an opportunity for pump storage here; there's an opportunity for combined cycle here, each one of which has its costs and its characteristics.

And then you start to get – put together, for each one of these scenarios, the portfolio of resources that meets it. And of course, there are many different portfolios that would meet that same need.

MS. O'BRIEN: And to develop these portfolios do you use a tool like Strategist, which is a product by Ventyx that we've heard about –

MR. RAPHALS: Yeah.

MS. O'BRIEN: – is that what – how that would be done?

MR. RAPHALS: Exactly.

Usually what you do is you make certain high-level choices. So for instance, you say I'm gonna – let's look at a portfolio that has no thermal power. Let's look at a portfolio that has a large hydro project and no thermal power and ask Strategist to generate the optimal mix of – detailed mix of resources that goes with that.

Let's look at a scenario that allows thermal power and doesn't have the large hydro project. Let's look at a scenario that doesn't have a large hydro project or thermal power, and each one of these will produce a list of – a detailed list of resources: acquire this on this date at this cost.

And in each one of those, you can add up all those year-by-year costs and take the net present value of it and come up with a number that is essentially the economic cost of meeting this scenario with these resources.

MS. O'BRIEN: So what I'm hearing you describing, Mr. Raphals, it sounds to me – we have had evidence here already that shows the difference – the two scenarios that were

developed by Nalcor for both the Integrated Island and Isolated Island Option, and I know you'd be familiar with those given your previous work.

MR. RAPHALS: Yeah.

MS. O'BRIEN: And this showed the generation plan that came out of putting in the resources they had available – you know, an expected load forecast and fuel prices and whatnot.

So – and I take your point that they did not include a CDM, and you believe that should have been included. But it sounds to me what you're describing is what they did. But perhaps, you're suggesting that you would run more scenarios than what they did? I want to make sure that I'm being clear on –

MR. RAPHALS: Yeah, no.

MS. O'BRIEN: – what you're saying.

MR. RAPHALS: I'm glad you asked about that.

Could we look at P-00052, page 113?

So this is the definition of the Isolated Island Option from the reference to the PUB. This is what the PUB was told to look at as the Isolated Island Option.

MS. O'BRIEN: Okay.

MR. RAPHALS: And you see that it has a number of specific resources between 2015 and 2030. A few small hydro projects: Portland Creek, Round Pond and Island Pond, on certain dates; it has a combined cycle combustion turbine in 2022, perhaps; the renewal of a wind project in 2028; and then between 2030 and 2067, Holyrood replacement and additional thermal.

MS. O'BRIEN: We've seen a more detailed version of this, but this is similar.

MR. RAPHALS: Well, that's actually my point. So this is the policy definition of these portfolios, portfolios which include Holyrood replacement and thermal options between 2030 and 2067. And then in the same document, on page 27, is the fleshed out version of this.

MS. O'BRIEN: Okay, yes. This is the graphic that we –

MR. RAPHALS: Right, and this was produced by MHI in response to – or perhaps MHI and Nalcor. I'm not sure exactly where it came from, but it's in the MHI report. And so here, this is what Strategist or a similar program would do taking those guidelines. So maintain supply-demand balance with our medium load forecast with no CDM and using only thermal resources, and then you would get this.

Now, if the – if BC Hydro –

MS. O'BRIEN: When you say using only thermal resources, I don't know if that's quite accurate, because there is additional Hydro in this plan as well –

MR. RAPHALS: Oh yes, excuse me. You're absolutely right –

MS. O'BRIEN: Yes.

MR. RAPHALS: – yeah. But not after 2030. I'm talking about just filling in that gap after 2030.

MS. O'BRIEN: Okay.

MR. RAPHALS: So there's the replacing of the existing wind farms, but there's no new wind. So this could well be one of the scenarios that would enter into a scenario study in an IRP. Unfortunately, it was only yesterday that it occurred to me to suggest this as an exhibit, so it was too late, but I've sent you links to appendices from BC Hydro's IRP, which, I think, illustrate this much better than I am doing, unfortunately, verbally.

But one of them is the portfolio results appendix, which shows the results of 60 or 80 different portfolios. Each one of which, the result looks kind of like this: it has a particular resource on a particular date and a particular cost. But the point is that it systematically works through uncertainties of load growth, CDM efficiency and costs, and it also then, for each one, explores varieties of different series of resources that

could meet that need. And so, one could even, I think – I don't think anyone would deny that there could be more wind in this scenario than is here. There's no new wind at all in this scenario. I think that the studies have started with saying there could be 80 megawatts more and then later studies went up to 300 and – but those aren't in this portfolio.

MS. O'BRIEN: Just to be accurate here, I believe there is some wind here.

MR. RAPHALS: With the replacements.

MS. O'BRIEN: There's a power purchase for wind here.

MR. RAPHALS: Yes, in 2014; but I'm talking about the period after 2030.

MS. O'BRIEN: Okay.

MR. RAPHALS: There's replacing two existing wind farms, replace their existing wind farm. So there's no increase in the amount of wind in the system after that first (inaudible).

MS. O'BRIEN: So in integrated planning, I take it you develop a large series of scenarios, I understand that; but at the end, how does one chose?

MR. RAPHALS: Well, one chooses largely based on net present value, which is a variant of CPW. Basically the – all the costs and – well, in net present value, costs and revenues – because if you're producing power for export, those export revenues really should be taken into your – into consideration as well. So, that's what net present value does.

So, each one of these grinds down into a single number in 20 – in the dollars of whatever year you're working in; and one can choose. One can choose either purely based on economics, or based on a combination of net present value and certain policy considerations; but it provides a very factual basis on which to compare things.

MS. O'BRIEN: So, I wanted – one of the documents that we've looked at are a number of sensitivities that were run and –

MR. RAPHALS: Yup.

MS. O'BRIEN: – I'd like – maybe if we could go to P-00014, please, which is the Grant Thornton report, page 54; and I'm just going there because it has a table that, for the – at the DG2, the sensitivities that were run by Nalcor.

Fifty-four. Page 54.

So, here's a list and we've had this – looked at this in the hearing room before, so, we have a number of sensitivities that were run by Nalcor with various fuel forecasts, various different scenarios. I know you've seen this before; how does this differ from, or does this differ from what you're speaking of? In other words they did run various scenarios in terms of the sensitivities.

MR. RAPHALS: Yeah. Can I just see the top of the column again? Just to make sure –

MS. O'BRIEN: Yes.

MR. RAPHALS: – I understand the titles? Yeah. Okay.

MS. O'BRIEN: So this was what they ran – this was their base case in the first column here. And they ran it for the Isolated Island, the Interconnected, and there was the differentials. So this was at DG2; the 2.1 billion differential between the two, and then they changed these variables here, came up with different CPW values, and here we see, on the final column, what the differential was for each of the different –

MR. RAPHALS: Okay.

MS. O'BRIEN: – scenarios.

MR. RAPHALS: And can you now just scroll down further to the bottom so I can see the bottom?

Yeah. Okay.

So, first of all, sensitivities are a very important aspect of planning. There's nothing wrong with using sensitivities as a tool. And to a certain extent, there's a trade-off between sensitivities and scenarios. So just to try to clarify that. A load forecast; you start with a single load forecast; a mid-level load forecast. So you could

do a sensitivity, as this does, to say: well, what happens if it's this much too high or this much too low?

MS. O'BRIEN: (Inaudible.)

MR. RAPHALS: That's a related, but different way to go about things, than to say: let's just assume that it's going to be high, and see what happens from there. And so, the thing about sensitivities is that they're essentially keeping all the other elements of the picture the same, and changing one variable. So they're useful because – I mean, there are so many uncertainties that it can really get out of hand.

And so, there's a place for sensitivities, but they're far – it's a far less powerful tool than comparing scenarios. And the main reason is that you're not really rebuilding your system. You're not rebuilding your resource plan under each one of these possible futures. So when you say, for instance, you know, lost of 880 gigawatts from 2013, going forward, which shows exactly the same – which shows no difference at all. (Inaudible.)

MS. O'BRIEN: Yeah. The CPWs worked out about even.

MR. RAPHALS: So, I don't think that this meant that, for the Isolated Island Option, that a whole new optimization was done. Well, first of all, an optimization wasn't done in the first place because there wasn't a full choice of resources available to choose for that Isolated Island Option. Again, we're limited to thermal resources. So it may be – for instance, if one had done a scenario involving – with an unlimited choice of resources – it may well be that a second scenario, based on the lower load, would produce different resources as the optimal scenario. And I don't think that that – that's captured in this analysis.

MS. O'BRIEN: And, again, I don't know that the evidence is consistent that the only generation options available were thermal options.

MR. RAPHALS: But in the Isolated Island option – if we're talking about the PUB review –

MS. O'BRIEN: Yes.

MR. RAPHALS: – I think it is – as far as I'm concerned – it's quite clear that the Isolated Island Option that was reviewed is the one that MHI presented.

MS. O'BRIEN: Okay.

Commissioner, that may be a good time for a break.

THE COMMISSIONER: Okay. So we'll take 10 minutes here now, then and come back.

CLERK: All rise.

Recess

CLERK: Please be seated.

THE COMMISSIONER: Ms. O'Brien.

MS. O'BRIEN: Thank you. Thank you.

Mr. Raphals, I'm gonna take you to a few of your – couple more of your submissions where you did go through integrated resource planning, just to ensure you covered everything off.

MR. RAPHALS: Okay, before we do that I'd just like to add one thought.

We were talking about the optimization of the Isolated Island Option; I think it's also important to think about the Interconnected Option. In a broader planning context, it's perfectly fine that we divide our options into those that do and don't have a transmission line, but there are also the question of the optimization of the Interconnected Option.

So transmission line with Muskrat Falls is clearly one of the ways to meet future needs with an interconnection. But there are other ways too: transmission with purchase power, transmission with Labrador wind, transmission with Labrador biomass. There's a whole world of other possibilities that weren't explored either. So I think that the too narrowed focus on predefined options is really true on both sides of the comparison.

MS. O'BRIEN: Okay.

If we go to – can go to page – or sorry, P-00363, which is the Labrador-Island Link EA submission. It's at tab 12 of your book and I don't believe we reviewed this yet, but it is page 9, I believe – that integrated resource planning. And I'm just taking you there, Mr. Raphals, so you can determine whether there's anything further from your submissions that you haven't had an opportunity to highlight yet with respect to integrated resource planning.

MR. RAPHALS: P-00363?

MS. O'BRIEN: P-00363.

MR. RAPHALS: Oh, page 9. Yeah. Sorry.

MS. O'BRIEN: I had it on my – if you just look through your book there and see if there was –

MR. RAPHALS: Yeah. So here I start off and go to –

MS. O'BRIEN: Yes.

MR. RAPHALS: – just a little higher on the page – the beginning of that paragraph.

MS. O'BRIEN: Yeah. Sorry. The beginning of page –

MR. RAPHALS: Yeah.

MS. O'BRIEN: Yeah.

MR. RAPHALS: So summarizing the way that – in the EIS the way that the planning process was described, there are three basic functions: first, is a forecast – energy and capacity; second, is evaluation of whether or not existing supplies are adequate; and third, there's development of expansion plans to meet the forecast.

MS. O'BRIEN: And here the proponent would be Nalcor that you're referring to.

MR. RAPHALS: Exactly.

MS. O'BRIEN: Okay.

MR. RAPHALS: So again, we've sort of – as we've seen before, I think there's a very important step missing here which is between two and three, which is to evaluate the extent to which efficiency will reduce those forecast needs.

MS. O'BRIEN: So that would be like CDM you're referring to.

MR. RAPHALS: Yeah. That's exact, yeah.

MS. O'BRIEN: Okay.

MR. RAPHALS: Yeah.

CDM is, I think, an expression used only here.

MS. O'BRIEN: Right.

MR. RAPHALS: That's why I keep slipping. But most places talk about demand-side management, DSM, or energy efficiency, but they're all essentially the same concept.

MS. O'BRIEN: Okay. Thank you.

MR. RAPHALS: So then Nalcor explains its "*Strategist* software, 'represents the optimum portfolio of available generation sources without the Project.'" And my point was that it hasn't been demonstrated that it is optimal, and the reason is that there are so many variables that haven't been taken into account. First of all, the uncertainty of the forecast, we've looked at just one line; we haven't looked at what would happen if load growth is lower than that or higher.

MS. O'BRIEN: So what you're saying there is – notwithstanding that they did a sensitivity for that – they didn't develop an optimal plan for the load forecast. Is that the distinction?

MR. RAPHALS: Well, at this stage I'm not sure there were – and it certainly – yeah, yes – I don't recall there being sensitivities in the EIS. There may have been but –

MS. O'BRIEN: Okay.

MR. RAPHALS: – not – I don't think there was – reading this text. Yeah.

And then later on, indeed, the sensitivities do move in that direction but I don't think they fully – that they fully replace a more fulsome planning process.

Yeah, I don't know if this is a good time to mention it, just sort of the evolution of IRP in the province – that I'm aware of – I believe it was in 2004 the Public Utilities Board, in a decision – I don't have it in front of me – which (inaudible) described IRP as a useful process that would probably be a good idea to explore. Then in their next – I think it was in the rate hearing in 2007 – they were much more positive and said, you know, we really should – NLH you really ought to do integrated resource planning, but given that the provincial Energy Plan is about to come out, we won't order it at this time because it would be unfortunate timing. And then it disappeared.

Well, it turned out there wasn't another rate case until, I believe, the one in 2013 in which I participated. In my evidence on behalf of the Innu Nation, I again added a small section reminding the board of this and suggesting that this would be a positive way to go forward. And –

MS. O'BRIEN: But this was after the Muskrat Falls Project –

MR. RAPHALS: Yes.

MS. O'BRIEN: – was sanctioned? Okay.

MR. RAPHALS: Indeed.

And then – and I believe in the current process as well, NLH's position has been we don't intend to move down this path unless the board tells us to. So –

MS. O'BRIEN: By the board, you're talking about the PUB?

MR. RAPHALS: Yeah, exactly.

So I think that's all in this document that's useful.

MS. O'BRIEN: Okay.

And the other – I believe we already looked at your JRP submission with respect to this. That was the other document I had –

MR. RAPHALS: Yeah.

MS. O'BRIEN: – that's P – it's tab 7, P-00358, page 4. But I believe you've already addressed that.

MR. RAPHALS: Yeah.

MS. O'BRIEN: The – would like to get some sense – I know at the PUB in particular, you gave evidence on the effect that – on the effect or the possible effect on the CPW analysis that Nalcor did. That the – Nalcor's approach to CDM, Nalcor's approach to integrated resource planning, what effect that might have had on the CPW analysis had they approached it a different way.

Could you, please, give the Commissioner your comments with respect to that?

MR. RAPHALS: Can you remind me where that is?

MS. O'BRIEN: I don't have an actual cite here. And so it – I guess, I would just say: Do you recall – or what effect, if any, would there be on the CPW analysis?

MR. RAPHALS: So my PUB comments is P-00360. I honestly don't recall, but let me look quickly and see if I know what you're referring to.

MS. O'BRIEN: You were advocating at the time that, say, Nalcor should have considered CDM – that Nalcor should –

MR. RAPHALS: Yep.

MS. O'BRIEN: – have done integrated resource planning. If they had done that, would there have been any change in the CPW analysis?

MR. RAPHALS: Well, certainly, I mean, you don't have to go to integrated resource planning to have a change in the CPW analysis, because integrating any reasonable amount of CDM reduces the load forecast, and so reduces the needs, and then your generation planning will change in accordance with that.

There is one document that I think would be useful in that regard. Give me just a second.

Yeah, it's P-00369, which is tab 19, on page 3.

MS. O'BRIEN: So this is a document that you –

MR. RAPHALS: Hmm.

MS. O'BRIEN: – before the UARB. So maybe if you could just give us the context for this document first –

MR. RAPHALS: Exactly.

MS. O'BRIEN: – as we've not discussed that yet in your testimony.

MR. RAPHALS: Right. It's really the idea more than the – but sure.

This is in the context of the Nova Scotia Utilities and Review Board hearing on the Maritime Link, where I was retained as an expert by the Canadian Wind Energy Association. And these are a series of information requests to us from the Consumer Advocate and the Small Business Advocate.

MS. O'BRIEN: In Nova Scotia?

MR. RAPHALS: In Nova Scotia, in relation to the written evidence that I had already submitted.

So on page 3, they asked – no, they quoted an exchange in which we had asked Nova Scotia Power: "Is NSPI aware of any possible adverse consequences that could result from under-estimating DSM?" – CDM.

So, do you see – the reason –

MS. O'BRIEN: Yes.

MR. RAPHALS: – I'm raising this is it's the same question, like: What are the consequences of underestimating CDM?

And they had responded: "If the effects of DSM savings were under-estimated, that is, DSM turned out to have a larger effect than anticipated, then" Nova Scotia Power "may have to serve less load than anticipated." The possible consequences could be lower requirements for RES, which is renewable energy standard, compliant energy. There's an obligation that a certain percentage of their energy be from renewable sources, so that would be less. So that was the context.

The question that I was asked is on the page before, right at the bottom of the page: a) Do you concur with this response?

I'm sorry, I'm not presenting this well at all; I'll have to start over.

So the Request IR-2, so: On page 18, you cite – (inaudible) – cite NSPML's response to IR-86.5, which noted that the underestimation of DSM performance can in fact contribute significantly to over-supply. In response, NSPML stated that: "'When planning long-term to meet future compliance regulations based on load it is proven to be on the conservative side of DSM assumptions because if they do not materialize then compliance is jeopardized.'"

This is essentially the argument that Nalcor has made, I think, that we don't really have any confidence that CDM will work, so it's more prudent to not include it in our planning.

MS. O'BRIEN: The idea being if the load is there and you haven't planned for it, you won't have the electricity to meet the demands.

MR. RAPHALS: Exactly, and if you had counted on CDM that it wasn't gonna happen, you'd be in trouble.

So then they asked me to comment on this response that I just read and the comment then is on the next page.

So then responding to the first part, do I agree, I said: "I do concur that, if the effects of DSM savings were under-estimated … then NS Power would have to serve a less load than anticipated." But the response is incomplete. "The only adverse consequence identified by NSPML that could result from under-estimating DSM is in fact a benefit – lower requirements for RES compliant energy. The response fails to" point our or acknowledge "that, if NSP had made inflexible commitments to purchase the amount of power that it had anticipated would be needed, the resulting over-supply could have adverse consequences for NSPI."

And then the second part: "Precisely because underestimation of DSM performance can in fact contribute significantly to over-supply, the second statement is overly simplistic. Conservative DSM assumptions are indeed less risky with respect to 'planning long-term to meet future compliance regulations,' but they create other risks, with respect to potential over-supply, that the Applicant appears not to have considered."

So this then is the risk of not adequately taking into account the future DSM – future CDM – that you'll end up acquiring more energy then you need. And this is not in these documents, but I can say that Quebec is suffering from having made exactly this error back in 2002.

Quebec – Hydro-Québec Distribution undertook a tender for new supply based on a forecast that was extremely conservative in terms of its future CDM. And, since then, actual CDM savings have been sort of on the order of eight terawatt hours a year greater than what was predicted at the time. And H-Q Distribution has a surplus and is suffering. And it's really a major problem that they have acquired far more energy than any, simply because they fail to properly forecast future CDM.

So, I know this isn't part of your Inquiry, but from my perspective it's a very real problem and a danger that comes of doing planning with inadequate forecast of future CDM.

MS. O'BRIEN: Okay. And thank you.

And just in reference to that last document, when we read the DSM there, when we translate that to this province though it would be CDM.

MR. RAPHALS: CDM, exactly.

MS. O'BRIEN: Okay.

Thank you.

Those are my questions for you on integrated resource planning and conservation demand management unless there was something further you wanted to add with respect to the positions that you've put forward.

MR. RAPHALS: I would like to try to clarify, I know my explanation of the BC process was fairly incoherent, I apologize for that.

I think – if you can give me just a moment to try to restate that more clearly.

MS. O'BRIEN: Yes.

MR. RAPHALS: I think I can do it better.

The documents that I would have liked to show you that I think you will eventually get to see, there are two documents from the BC Integrated Resource Plan.

The first, as I said, is a result of the portfolio analysis. And what it does is for a large number of portfolios, it evaluates their net present value. And just to give you a picture of what these look like, each one is, I think, four pages long.

At the top of the first page it shows the policy constraints. It says, for instance, which load forecast, whether or not it includes Site C, whether or not gas is allowed and one or two other things. Then, along the right-hand side it lists year by year the resource additions that strategist figured out are what would make the optimal – the least-cost solution given these constraints; resources of all different types. And then, in the upper left-hand corner, it sums up the year by year, sorry, the overall net present value of this.

So then, for the same constraints you'll then have five or six or seven different portfolios for the same context of a load forecast, of a market price forecast, you'll have different portfolios showing different resource mixes that meet those same needs; some with thermal, some without, some with Site C, some without, and each one with a cost and that then becomes the primary inputs into the big picture deciding so what are we gonna do.

So the second document, which is appendix 9A, is really the plan. It's after they've done all this and decided here is our integrated resource plan; here's our preferred resource portfolio. And it shows results with and without LNG, because in BC the LNG loads were very uncertain and very large. So they did the whole planning twice, with and without liquefied natural gas.

But it's a series of tables that shows year by year through 2040. And down the left column, first there's all the existing resources – exactly how much energy and capacity it's going to provide in each year. And then all the new resources that are to be added based on the selected portfolio. And exactly how much DSM – CDM is forecast for that year.

And so then it shows that there is balance, that the energy and capacity needs are met for the future. And it shows very beautiful graphs – which I wish I could show you – that show bar graphs that show the load forecast without DSM – which is a high line – and the load forecast with DSM which is a much lower line. And, again, both for energy and capacity, all the different resources that stack up, so that the resources (inaudible) that lower line for each year.

And one doesn't necessarily agree with their conclusions. You know, I had to audit actual criticisms of their process and their choices – which aren't, I think, particularly relevant here – but as a process of how to really think through all the possibilities and get to the one that has a chance of being optimal, I think it's the way to go.

Thank you.

MS. O'BRIEN: And if we could just go to Exhibit P-00360 please. And this is a comments, further comments – your comments to the PUB. And if we could just go – and I just want to confirm something – to page 5.

At this – in this, your submission to the PUB, you refer to here – maybe give you a chance to review that where you talked about the scenario versus scenarios.

MR. RAPHALS: Yeah.

MS. O'BRIEN: Is this the concept that you're speaking of here? Having these multiple scenarios?

MR. RAPHALS: It is, but actually I would go back and start on the previous page if you don't mind.

Yeah. So I'm on the paragraph that starts with "These processes …."

MS. O'BRIEN: Mm-hmm.

MR. RAPHALS: So this is all the things we've just talked about. Saying that these planning "… processes … start with a load forecast, a set of resource options and their costs, and an optimization program like Strategist. But if all we needed was the program, these planning processes wouldn't exist."

"In fact, Strategist is just a beginning. Then, it takes a lot of hard work, to find ways to improve the plan, to make it better and more robust.

"This, indeed, is one of the most important differences between the Interconnected scenario and the Isolated Island" one: "the former has had thousands of man-hours of effort put into it to perfect, optimize, and reduce uncertainty …." "The Isolated Island scenario remains an early draft."

But there's another important difference. If the Muskrat Falls Project goes ahead, we have a very good idea what the power system will look like in 50 years. But if it doesn't, the future is really open to unfold. And the chances that it will unfold precisely as set out in this particular Isolated Island scenario are really very small.

"It is important to emphasize that these scenarios are optimized **for a given set of assumptions**. MHI made this point clearly in the closing paragraph of its Executive Summary" – and this is from P-00048, page 21, but we don't have to go there – " With projects of this magnitude, and considering the length of the analysis period, there are risks and uncertainties associated with the key inputs and assumptions. Changes in these key inputs and assumptions will affect the financial results and must be assessed to determine materiality. These changes in key inputs and assumptions can impact the results of the analysis and shift the preference for what is the least cost option."

To me, their choice to place this at the very – as the last sentence of their executive summary should be read as indication that all the numbers before us do, indeed, confirm that under all these assumptions, the CPW is less for the

Interconnected Option. But given the length of the analysis period and all the risks and uncertainties, the question is whether that difference is meaningful.

And I haven't mentioned this yet, but I think the length of the analysis period is also a very significant question. I'm not aware of any normal utility planning that goes farther out than 20 years. And in most cases it's 10 years – Hydro-Québec plans over 10 years.

MS. O'BRIEN: How would one plan for a long life – long, you know, capital life in – project like hydroelectric – like a hydroelectric dam if you didn't go out with a long –

MR. RAPHALS: Well –

MS. O'BRIEN: – with a long forecast?

MR. RAPHALS: – historically, usually the answer is, if it makes sense in the first 20 years it will definitely make sense after that because it will be cheaper. Again, that's based on cost of service, approach to costs. Now the one exception is indeed Site C. In Site C, BC Hydro, sort of at the last minute, dragged out an extremely long-term forecast, which is really based, like this analysis, on the depreciation period of the asset.

But it was highly criticized by the JRP, and by the Utilities Commission simply because forecasts – even 10-year forecasts – are exceedingly uncertain. And the idea that 50 years out we have any idea what the world is going to be like is just fantasy. If you think back to 50 years ago, it was what – it was1968; so there's so much of today's world that was unknowable. In 1968 there weren't personal computers. There weren't cell phones.

Our entire, you know – a great deal has changed. And so I'm going to talk – I hope a bit later – about fuel forecast uncertainty which – in which indeed we do have some information about –

MS. O'BRIEN: We –

MR. RAPHALS: – validity of long-term forecasts.

MS. O'BRIEN: We can go there now if that's a good place to do it.

MR. RAPHALS: Actually, let's save that for later 'cause then – just continue here 'cause I think this was –

MS. O'BRIEN: Okay.

MR. RAPHALS: – sort of in the middle. So, I'd made the point that while these scenarios are optimized for these particular assumptions – the assumptions are uncertain and therefore the results are uncertain. In other words, we don't really know which option is least cost because we don't know which inputs are the right inputs.

The problem is, those assumptions and hypotheses will inevitably be contradicted, or at least refined by reality as it evolves. And as MHI also wrote, and this is from Volume 2 which is P-00049, page 205, which I think is not your page number – 205 is the published page number – they wrote that fuel price forecasts have a short shelf life. "So the real challenge is to find a plan that is optimal – not just based on current assumptions, but that is robust over a broad range of possible futures."

"The challenge is to try to understand the implications with the possible twists and turns of fate, and to try to avoid taking irrevocable actions that would turn out badly if reality turns out to be different from the planning assumptions. Preparing such a long-term energy plan is an iterative process in which programs like Strategist play a … important role. But the program's output is the beginning of the planning process, not the end of it."

Then I refer to the Northwest Power Plan which is something produced by the Northwest Power Planning Council periodically over the last 20 years or more. The NPPC has really been a leader in dealing with uncertainty and risk. And, I think, one of the issues that even modern planning has not really figured it out how to integrate, but that's really a significant issue, is what you might call optionality. In the investment world it's well-known that if you have cash – cash is king. That there is – even if cash produces no interest and no returns today, there is value in having cash because it means that in the future as surprises occur, you can

make choices based on those surprises. And if you input all your money today into what looks today like the best good thing – whether it's Google or Apple or Tesla or who knows what, you know, it could turn out great, and based on today's projections, it's fantastic, you know, but things can happen over time such that it isn't.

And so there's an inherent advantage to plans which are modular and in which decisions are made gradually over time, compared to plans in which a single decision is made that's irrevocable and defines the future over a long period. I mean, Nalcor is not alone in not having integrated that into its planning, most utilities don't. But at the time, it's an important factor. It's an important factor.

So then, to go on in the document, I wrote: "Clearly, the Isolated Island Scenario is a scenario, not a plan. If load growth is greater, or lower, than the Reference Forecast, the need dates for resources will have to be adjusted. If the economic analysis underlying the wind power limitation is modified … resource choices" – could – "change.

"Given all this, I can't help but think that, had the Government asked you to compare the Interconnected scenario to isolated island scenarios, plural, rather than comparing it to The Isolated Island Scenario, singular, the substantial resources devoted to this exercise would have been better spent."

And I – maybe you should point out that in the BCUC Review of Site C, the Commission was given precisely that mandate to ask is there a better choice? Not to compare it to a particular choice. And the Commission devoted a great deal of effort and, I think, in a very short time frame did an extraordinary amount of work to try to define what would be optimal. And I think it's really unfortunate that the PUB didn't have that liberty.

MS. O'BRIEN: Thank you.

Now we'll move then to the fuel forecast, and I know – if we can go to P-00363, and I believe – starting on page 34 – and this is the environmental assessment on the Labrador-Island Link document.

MR. RAPHALS: Correct.

Now, I should say that I am not an expert in oil and gas markets. I have some familiarity with them, but it's really not my field. But I do know that there's a lot of uncertainty around them. So if we go to the next page, page 35, the graph in the middle. So these are fuel forecasts precisely from the Northwest Power Planning Council. Note that there is not one line; there are five lines, and that the gap between the lowest line and the highest line – as you – the farther out you go, gets bigger to the point of where, by 2030, it's essentially two to one.

I suspect that PIRA's fuel forecasts look like that, too, although I don't think the other scenarios, other than the medium scenario, at least to my knowledge, were not made public.

But I think it was in preparing for the PUB process, I did find some very interesting data put together by the US Energy Information Agency. The graph is on the next page, but I think there's an exhibit that has a more legible version of it.

MS. O'BRIEN: There is. Can we bring up Exhibit P-00362, please? And that's tab 11 of your binder. It's still not what one would describe as legible, but it's better than what was in the report.

Madam Clerk may be able to zoom in if there's an area that is …

MR. RAPHALS: Well, first let's just look at the – yeah, maybe just zoom in a little bit more, so we can see the top half – even – as big as you can, just to – and down a little more so that we can see the top. Perfect. Okay.

So these are the data that were published by the US Energy Information Agency. And what they did is they reviewed each one of their own forecasts, going back to 1982. And so – like, if you just look at the first line – it's all the same – so if you look at the first line, it says that in their 1982 forecast – the prices that were then forecast for 1985 to 1990 are shown here. So it ranges from $29 to $59.

So then, for each year, they showed the prices that were forecast in that year for each future year in which they made a forecast. Obviously, the – they trail off at the end, because they don't all go to the same period.

Actually, it looks like – yeah, I guess most of them did go past 2009, but anyway, so these are real nominal dollars per barrel, and it says billions, but that's obviously wrong. It's nominal dollars per barrel.

So now, in the second – in the lower half – if you can scroll up to show the lower half. So I did two things here. I'm sorry, you have to go back up again, just a little bit, and you see that there's an actual line at the bottom, just under the forecast. That's the actual average price per barrel for each one of those past years.

So all I did was I converted the – for each forecast, I described it as a percentage in relation to the actual value. So if it was exactly right, it was a hundred per cent; if it was 10 per cent below, it shows as 90. If it – or it shows as minus 10. If it was 10 per cent high, it shows as plus 10.

So this lower graph, which is my spreadsheet, is simply the upper values –

MS. O'BRIEN: Sorry, if it was exactly correct, you described it as what?

MR. RAPHALS: As –

MS. O'BRIEN: You said plus –

MR. RAPHALS: (Inaudible) actually, hang on.

MS. O'BRIEN: I'm wondering did you mean to say zero as opposed to a hundred?

MR. RAPHALS: Just a moment.

Well, we have an error. Actually, part of it – part of this graph is done where it's a hundred per cent or 90 or 110, and part of it is done as minus 10 per cent and plus 10 per cent. So the – unfortunately, the numbers are wrong but – or are not consistent. They're right, but they're – in some parts of the graph, they're calculated differently.

But the important thing is the directionality, and so I applied colours – positive colours when they were above, when the forecast was above the actual value, and green colour – sorry, blue when it was above the actual value and green when it was below.

MS. O'BRIEN: So blue represents forecasts that, as the future unfolded, proved to be too –

MR. RAPHALS: Too high.

MS. O'BRIEN: – too optimistic a forecast?

MR. RAPHALS: Exactly.

MS. O'BRIEN: And the green are where it turned out that the forecast was too pessimistic?

MR. RAPHALS: Exactly.

MS. O'BRIEN: Okay.

MR. RAPHALS: And what I expected to see was some sort of a mosaic of green and blue, because we always hear from forecasters that well, you know, sometimes we're too high, sometimes we're too low, but it all averages out in the end. And to me it's very striking that the blues and the greens stay together, which means – which is to say that for the better part – so from the – from – in 1982 down through '87 or '89, and in some cases even later, forecasts were systematically too high; the forecasts were wrong, but they were all too high.

And then there's a very long period when forecasts were all too low.

MS. O'BRIEN: So coming through the '90s here is what you're referring to.

MR. RAPHALS: And it actually isn't so surprising because really forecasts are always based on current reality. If you look at any forecast, it starts with where we are today, and it goes forward, and it goes up – a little more a little less. When there are sudden changes in the price, that wasn't – forecasts don't predict those. And so when oil prices went through the roof that hadn't been predicted. So suddenly all the forecasts were too low, then when oil prices fell, that hadn't been predicted either and suddenly all the forecasts were too high. But they were

too high consistently over a long period of time and substantially.

So, again, this speaks to: How much can we actually bet the farm on the forecasts? And the answer is: It's true we have to have forecasts, you know, this industry works with forecasts, you need to have them. But you need to have an enormous amount of humility about what they really mean and as soon as you start believing your forecasts, you're opening yourself to significant dangers.

MS. O'BRIEN: Thank you.

I'll go, then, now to wind.

MR. RAPHALS: Yup.

MS. O'BRIEN: So if – again, I will start perhaps with P-00363, it's a tab 6 of your book. Oh, it may be at tab 7, I apologize – page 21.

MR. RAPHALS: 00363?

MS. O'BRIEN: Mmm, I may have the wrong reference here.

MR. RAPHALS: It's tab 12, I think.

MS. O'BRIEN: Yeah, my apologies. Hopefully, page 21 is right.

MR. RAPHALS: Yes, I think it is.

So this is following up on – yeah, just go to the next page, because it's just the title at the bottom: Wind Power.

MS. O'BRIEN: Yes, okay. Yeah, so we started here.

MR. RAPHALS: Yeah.

This is following up on some of the work from the JRP, and sort of just summarizing it. But as I started out by quoting the EIS, which said: "that 'Good wind sites are often located in remote locations, far from places where the electricity is needed.'" This is indeed true in many places, but Newfoundland is not one of those places.

This image – can you just scroll down so we can see the map? That's a wind map of the Island of Newfoundland.

MS. O'BRIEN: If you could just watch your mic there –

MR. RAPHALS: Oh, sorry.

MS. O'BRIEN: Thank you.

MR. RAPHALS: That's a wind map of the Island of Newfoundland. If you looked at a wind map of Canada, you'd see that most of it is green with little tiny splotches of yellow and red in different places.

I think everyone acknowledges Newfoundland has a world-class and very extraordinary wind resource.

MS. O'BRIEN: I don't think anyone is particularly surprised by this chart.

MR. RAPHALS: So then the question is: What can you do with that? And this was – so this document is speaking to EIS for the Labrador-Island Link which stated that there were two limits for the possible level of wind integration: an economic limit and a maximum technical limit.

The economic limit was described as 80 megawatts, after which there would be a significant increase in the risk of spill – I'm reading, by the way, from page 23. Yeah, that paragraph.

The economic limit, in excess of 80 megawatts, there would be a significant increase in the risk of spill at hydro reservoirs. "The study noted that an additional 20 MW of wind power could result in an increase in expected spill from 9 to 19 GWh/yr, with a cost of $1.3 million/yr." And: "The technical limit could require curtailment of wind down to 130 MW during periods of light load. To avoid incurring these costs, NLH recommended limiting installed … power to 80 MW."

I'll just say right here, these costs – assuming that they're correct – don't mean that there shouldn't be wind. It just means that these are costs that you have to take into account in

developing portfolios involving wind. And whether or not these amounts are significant; whether amount – whether or not these additional costs from spill and/or from curtailment are significant enough to make wind non-economic remains to be seen.

So, I think a better statement is not that they're limits but simply that they are constraints. They're economic factors that would flow from integrating wind power. But just to be clear, if the costs of a scenario with a lot of wind were dramatically lower than the alternatives, even with these additional costs taken into account, then it's just additional costs. It's just part of the scenario.

So I don't see that this in itself is – justifies the conclusion that was made that we can't look at scenarios with more than 80 megawatts of wind power.

MS. O'BRIEN: Okay.

I'm gonna take you to another document where you discuss this, in the event that there's something additional there.

MR. RAPHALS: Just a second.

MS. O'BRIEN: Oh.

MR. RAPHALS: I think there's more here that might be worth mentioning.

THE COMMISSIONER: I think it's the second aspect of what Nalcor was saying. Aside from the 80 megawatts, there was a – there was an issue with regards to the amount they could actually take into their system.

MR. RAPHALS: Well, that's a very interesting point. The – and I think we may get to this later with the Hatch study. But the – what they described as a technical limit is, in fact, also an economic limit. Because what it simply says is that during certain hours of the year, during the – during low load hours when there's a certain minimum generation of the existing system, one might have to curtail the wind. But this is a normal feature of wind farm operation that you can say: I'm sorry, you know, for the next six hours you're gonna have to turn off your machines, we don't – we can't take your power. Again, it becomes a cost. You have to, you know, something has to be negotiated with the owner of the wind farm: under what conditions they can be curtailed and who pays for it and so on. But a true technical would be that the degree of variation of hour-to-hour or minute-to-minute variation of the wind resource exceeds the abilities of the existing system to integrate it. But certainly this does not refer to that.

MS. O'BRIEN: Okay. And we will get – I am gonna put a question to you about the work that Hatch did. But before that, I'd like to finish off with respect to what your positions that you put forward before –

MR. RAPHALS: Yup.

MS. O'BRIEN: – the JRP and the PUB.

So is there anything further from this document that you wanted to highlight?

MR. RAPHALS: Well, I think we should actually – this goes more into spillage and these same points I just made.

I would mention perhaps on page 25, just as sort of an aside, but maybe an interesting one. Farther down, yeah, there. That at the time in 2012 the Government of Newfoundland and Labrador had issued a request for proposals – the Department of Natural Resources issued a request for proposals as part of its Energy Innovation Roadmap on the question of grid inflexibility or integration, and the RFP states, and it's at the top of the next page: "The ability of the grid to absorb higher penetrations of intermittent wind energy is a function of the flexibility of other generation" –source – "supply, interconnection, … loads, and the availability of" electric "storage facilities. This is particularly challenging for" NL "given the absence of these features at the present time.

"One of the work products requested is to: 'assess the flexibility of the existing" generation "capacity in Newfoundland and Labrador, particularly with respect to the integration of a significant amount of variable generation (e.g. wind power)'."

And the consultant is also asked to recommend options and technologies, to "recommend

options for the development of power management strategies and system designs that are tolerant of high proportions of wind generated power …."

I don't actually know if this RFP ever led to a contract or what became of it, but I would be very interested to know. But I never heard anything from it afterwards.

But I would like to go back to my second document to the JRP.

MS. O'BRIEN: Okay.

MR. RAPHALS: Tab 9, is it?

MS. O'BRIEN: So –

MR. RAPHALS: No.

MS. O'BRIEN: Sorry –

MR. RAPHALS: Tab 7, P-00357. No, no.

MS. O'BRIEN: P-00358 at tab 7. P-00358.

MR. RAPHALS: Right. Yes.

MS. O'BRIEN: And I believe page 10 is where this document picks up –

MR. RAPHALS: Exactly.

MS. O'BRIEN: – wind.

MR. RAPHALS: Yeah.

MS. O'BRIEN: It's on the screen now.

MR. RAPHALS: Yeah. So we can jump to the next page. This is just a quote that fleshes out a littlie bit what I said earlier. This is from Mr. Bown, who "explained that the province had chosen not to pursue further wind development until after Muskrat Falls and associated transmission are in place." Quote: "The policy right now is that we are not going to take on any more wind development on the Island until such time as we are connected to a grid that will enable us to utilize the full benefit of that."

MS. O'BRIEN: So this would be Charles Bown from the Government of Newfoundland and Labrador.

MR. RAPHALS: Yes, I believe so.

"There is only so much wind energy that we can use on an isolated system. And if you apply too much wind and that there is – and you enter into a contract where you have to take that wind, then you run the risk of having to spill water should you need to take that load when the demand is down."

Again, the response is (inaudible) – sorry. As I described earlier, I have no dispute with the fact that that kind of situation may occur, but simply, my point is that those are costs that need to be taken into account when comparing it to other options.

But the reason I brought you to this document – so this, by the way, is the document that I filed on the very last day of the hearings. I don't think we've talked about this maybe – I don't know if it's of interest. But the first hearing on energy matters was held fairly early in the process, and it was clear that there was going to have to be a second – a follow-up, and for reasons that I don't know, that follow-up was scheduled on the very last day of hearings. So a lot of questions were raised on that last day and there was no opportunity to clarify them, because I think, based on the terms of reference, hearings had to end on that day.

MS. O'BRIEN: So this is at the JRP?

MR. RAPHALS: This is at the JRP. Yes.

MS. O'BRIEN: Yes.

MR. RAPHALS: So what happened that last day was in the morning there were questions and answers for it, and then I ran back to Roberta's house and typed frantically and submitted this by the 4 o'clock deadline. So this is a very rapidly prepared document.

But I had had the benefit of consulting with a colleague who is a wind developer and put together a rough modelling of the costs of a wind – of a large-scale wind farm on the Avalon Peninsula.

Just as a point of reference. This is really back of the envelope, but it's back of the envelope done by professionals, so it's – these are not my calculations, really, they're those of a –

MR. FITZGERALD: Commissioner?

MS. O'BRIEN: Sorry.

MR. RAPHALS: – wind developer.

MR. FITZGERALD: If the witness is going to be talking about information he's gotten from third parties, that really should be put on the record, as opposed to a back of the envelope, saying who the professionals are. I think we should know who these people are.

THE COMMISSIONER: Any response, Ms. O'Brien?

MS. O'BRIEN: This is – I'm having the witness review the work that he had filed, obviously, previously, before the JRP. I don't know if that was a matter of record before them or not. I'll leave that. I don't know what Mr. Raphals – if he can explain who (inaudible).

MR. RAPHALS: The colleague who helped me with this had asked me not to use his name out of concern of possible adverse consequences to his company in the future – in their future relationships with Hydro and Nalcor, so I didn't – I agreed not to.

I'd be more than happen to share with the Commission, but I'm not really comfortable sharing it publicly (inaudible).

MS. O'BRIEN: Commissioner, I don't believe – for the evidence I want to get from this witness, I don't believe the – that particular chart and the costs are going to be particularly relevant to your proceedings here. So if the solution is that we just don't go to that evidence, that – I think that wouldn't affect my presentation.

MR. FITZGERALD: Yeah, I continue to object. We don't know where this is going. It's okay for Ms. O'Brien to say, well, we don't think that this is going to have an impact, but obviously, this witness has been put forward to present a position, to present views, and if the witness is uncomfortable with providing his source, my client and other clients here should not be prejudiced by that, and I object to this evidence going in.

THE COMMISSIONER: Well, I think what I'm going to do is if there is a need – and we'll listen to the evidence, Mr. Fitzgerald – if there is a need to get it, then – if there's a concern about – or if there was an undertaking not to provide the name publicly, then the Commission can get that name. And if need be, we'll figure out how that will impact you and your clients, and we'll deal with that at that time.

I really sort of – I don't know where we're going with this myself, so I'd like to just see where we're going with it, and then figure this out – how important it would be to get that name.

Ms. O'Brien.

MS. O'BRIEN: Thank you.

Mr. Raphals, you can continue.

MR. RAPHALS: So the – if we could go to just the last page of this document – farther down. Actually, sorry, let's go back to the top, and I'll – I wrote – and again this is the document that I – that GRK presented, which I prepared in the JRP proceedings.

"Given the extraordinary wind resource on the Island … and in particular on the Avalon Peninsula, the development costs per unit energy would be considerably lower than elsewhere in Canada.

"We did some rough modelling to determine the costs of a wind development to produce 3.9 TWh/yr. The all-in capital cost would be under $2.5 billion, with an annual operating cost of $50 million (less than those of Muskrat Falls.)

"Given the quality of the wind resource, the power density is estimated at 1.5 MW/square km." And the result is a real levelized cost of $75 a megawatt hour, 7.5 cents a kilowatt hour, and a number of parameters are listed below.

MS. O'BRIEN: So Mr. Raphals, we've just heard you summarize your – the positions that you raised prior to sanction of the Muskrat Falls

Project with respect to wind and your position that there could have been more wind and that – how the technical and economic limitations were used.

Since you did that work however, further work was done on wind integration in this province, and we've had two reports filed and that's Hatch – which is filed as – the Hatch report, which is filed a P-00057, and then MHI also did a review of wind in the work that had actually been done by Hatch, I believe. That's been entered as P-00059.

Did those reports address – first of all – have you had an opportunity to read those reports?

MR. RAPHALS: I have read the Hatch report and only glanced at the MHI report. I've read the executive summary but not all the details of the (inaudible) –

MS. O'BRIEN: Okay.

And so just answer this to the extent you can, and if you feel you can't answer it, well then don't.

The question is though, the concerns that you raised, one of – what the Commissioner is looking here is what concerns were raised and how – you know, how they were addressed. That work that was done on wind integration after you gave this evidence, did it address your concerns, or to what extent did it address your concerns?

MR. RAPHALS: Well, I would say it spoke to them in that it addressed the question. Speaking, just for the moment, to the Hatch report, I don't think that it resolved – or I don't think that it disposed of my suggestion. So if we want to see this as that I made a suggestion that there's – here's this alternative resource that could be developed – I think the Hatch report is very interesting, but I don't think that its conclusions are as strong as they seem to be.

And maybe, if I can explain that.

MS. O'BRIEN: Yes, but – you can, but I just – we really want to understand – rather than giving additional opinions on Hatch's work, if you can really keep it focused to how it did or did not address the concerns that you raised.

MR. RAPHALS: Well, in that my essential argument was that the concerns raised are economic both in terms of hydro spill and wind curtailments, they are additional costs aside from the cost of building wind turbines. Additional costs are – would be created by having these wind turbines and, therefore, should be taken into account in an economic analysis.

The Hatch report does demonstrate in a certain amount of detail the second constraint, it is that low load constraint and the amount of additional thermal generation that would be displaced by additional wind, and it shows that the more wind you add, the greater that effect is. But it doesn't – and it doesn't attempt to dispose of that question, economically, to say: Well, does this or does it not mean that wind is too expensive and we should forget about it?

Furthermore, that whole analysis is based on the existing configuration of the thermal system under which a minimum numbers of thermal units are required at all times. And it states that –

MS. O'BRIEN: This is the Hatch report you're referring to?

MR. RAPHALS: The Hatch report, yeah.

MS. O'BRIEN: And if you could give the page number, please.

MR. RAPHALS: Yeah, P-00057, page 31.

So this is reporting on a sensitivity to the main study, which I can go to as well if – maybe we should just for completeness. I don't want to give the impression of – so let's start on page 24, and it's sideways so it's going to be hard to read. Is there a way you can turn it?

MS. O'BRIEN: It's not obvious to me.

MR. RAPHALS: No, it doesn't. But, anyway, the top column you see now is the one that we care about. So each line going down, which is from left to right on the screen, are adding another 50 megawatts of wind power, and this is a simulation – yeah, if go over to the left – just

go to the – beautiful, thank you. Page 24 – I think one more page please.

Yeah, so this is looking at wind power in 2035, and each line is adding another 50 megawatts of wind power. And in the – well, we can jump to the column on the right, which is the bottom line, is showing wind efficiency at displacing thermal. So what that means is if you add 100 gigawatt hours of wind, how much thermal do you displace?

So for the first 40 megawatts, you get almost all of it. Your 50 megawatts – sorry, your 100 gigawatt hours of wind displaces 97 gigawatt hours of thermal. But each addition of 50 megawatts of wind, you get a little bit less. And actually, in earlier years, this effect is much greater. Maybe we should even see that just for more clarity. So let's go back up to page 22.

So this is the same graph but for year 2020. And here we see that each 50 megawatts additional of wind, you get less and less efficiency at displacing thermal. The point where the last line – you've added 100 gigawatt hours of wind, but you've only reduced 23 gigawatt hours of thermal.

Now, these are marginal values, so the combined value is not as bad as it looks here. But still it's a real reduction, and that's this primary constraint about the difficulty of integrating wind into the existing system.

Now, if we jump to page 31, to the sensitivity analysis, and go back to portrait view. It's a sensitivity for a system where there is no minimal thermal generation, so where we abandon the constraint that there has to be a minimum number of thermal units operating. And there, we see that, essentially, this whole problem disappears.

It's in the last paragraph, the second sentence: "The efficiency of displacing thermal generation is over 90% all the way up to 300 MW of new wind" generation, and then drops "to 78% for the next 100 MW increment. This indicates that significantly more wind development could potentially be economically viable without the thermal minimal constraint. However, it will likely be the mid-2030s before Holyrood will be replaced by generating sources capable of operating at no minimum" level "and by that time the system will have already reached the recommended wind penetration level." In other words, this constraint is dictated by the Holyrood plant.

And so, again, if we were starting out with a blank page, thinking about what is the optimal solution. And based on this finding that wasn't – this is dated 2012, okay, but I certainly wasn't – I didn't know about it then – I don't know if – I don't think it was – that it was in the filings. And an Isolated Island Option, which includes a major refurbishment of the Holyrood plant such as to minimize or – to reduce or even eliminate this requirement of minimum units, then suddenly the wind constraint – the technical wind constraint – isn't there at all.

MS. O'BRIEN: Thank you.

Commissioner, I do – we're nearing 4:30. I do have one last area of questioning for Mr. Raphals and then, obviously, my friends will want to have an opportunity to cross-examine him.

I'll leave it to you whether I continue on now or recess 'til tomorrow.

THE COMMISSIONER: I see stars in some of the eyes in front of me. So I think what we'll do is wait until tomorrow to let you finish off with Mr. Raphals and then we'll begin.

I was counting on tomorrow being actually a day that we would have to get prepared for the next couple of weeks, but we will continue on and, hopefully, finish sometime early tomorrow so that everybody can do what we're going to be doing, and that is preparing for the future.

All right. So we're adjourned 'til tomorrow morning at 9:30.

CLERK: All rise.

This Commission of Inquiry is concluded for the day.