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Thursday, December 5, 2013
Upon commencing at 9:30 a.m.
THE CHAIRMAN: Good morning. I'd like to reconvene the hearings.
I'd just like to note that I was laying in bed this morning listening to CBC Radio, hoping we'd get called for a snow day but it wasn't to be. So here we are.
I guess I shouldn't feel too badly. After all, Dr. Luttermann, I understand, came through much more weather than we had to come through to get here. So we're glad you made it.
Ms. Kearns?
MS. KEARNS: Good morning. Dr. Luttermann, I'm going to start by asking you a few questions by way of introduction, but first if you can introduce yourself for the record and then you'll be sworn.
DR. LUTTERMANN: My name is Annette Luttermann.
Annette Luttermann: Sworn.
MS. KEARNS: Dr. Luttermann, you have an interdisciplinary Ph.D. out of the biology department at Dalhousie University; is that correct?

DR. LUTTERMANN: Yes.

MS. KEARNS: And your thesis topic was "Historical Changes in Riparian Habitat of Labrador's Churchill River Due to Flow Regulation, the Imperative of Cumulative Effects Assessment"; is that correct?

DR. LUTTERMAN: That's right.

MS. KEARNS: And what disciplines did you focus on in your Ph.D.?

DR. LUTTERMANN: Ecology, landscape ecology, environmental law, cultural anthropology and environmental impact assessment.

MS. KEARNS: Thank you.

And the focus of your Ph.D. was on the need and feasibility of conducting cumulative effects assessments on a broader scale for a watershed; is that correct?

DR. LUTTERMANN: Yes.

MS. KEARNS: And would it be correct to say that your area of specialization is riparian habitat ecology, and specifically boreal river ecology?

DR. LUTTERMANN: Yes.

MS. KEARNS: And you focus in your work on the effects of hydro development on

riparian habitat, is that correct?

DR. LUTTERMANN: Yes.

MS. KEARNS: As a boreal river ecologist, do you have the expertise to give opinions on the effects of hydro development on fish?

DR. LUTTERMANN: To some extent. It's not been the focus of my work, but I have been working on the effects of hydro development on boreal rivers for almost 30 years, and I have read hundreds of papers on the effects of fish, I have worked with fisheries biologists in the marine and fresh water environments. So I believe that I do have the expertise to be able to read and interpret the scientific papers that are written about the effects on fish and rivers affected by hydro development, yes.

MS. KEARNS: Thank you.

And in your studies where you focused on cumulative effects, you studied with Dr. Peter Duinker, who the panel has heard reference to in these hearings as an expert on cumulative effects assessments; is that correct?

DR. LUTTERMANN: Yes.

MS. KEARNS: And a focus of your

masters studies and your Ph.D. was on the environmental assessment process; is that correct?

DR. LUTTERMANN: Not of my masters. My masters work was focused on management and conservation of the George River caribou herd in Labrador Ungava Peninsula, and looking at the interjurisdictional constraints and opportunities for co-management of this herd for long-term conservation.

MS. KEARNS: And you testified at the joint review panel for the Lower Churchill project on the cumulative effects of multiple hydro projects on a river system and justification for a basin-wide cumulative effects assessment; is that correct.

DR. LUTTERMANN: Yes.

MS. KEARNS: And in your work, you have worked for Innu Nation in the past on hydro development?

DR. LUTTERMANN: Yes.

MS. KEARNS: And you are currently working for the Treaty 8 Tribal Association in B.C.?

DR. LUTTERMANN: Yes.

MS. KEARNS: And you have worked for

Pimicikamak for approximately two years; is that correct?

DR. LUTTERMANN: Yes.

MS. KEARNS: Thank you, Dr. Luttermann. You can go ahead and start your presentation. Thank you.

DR. LUTTERMANN: All right. I need the procedure person.

You know what I have noticed this morning is I don't have any friends. I'm up here all by myself.

Thank you, Mr. Chairman and the panel for being so patient in allowing me to switch my time. I just couldn't get out of B.C. yesterday due to the weather. But I'm very happy to be here. (Cree spoken)

So the title of my presentation today is comments on some issues of concern to Pimicikamak regarding the Keeyask Generation Project Environmental Assessment. And so that's a typically, you know, very academic qualification of what I'm going to say. I have decided to focus on a few areas rather than trying to address the impact assessment as a whole certainly.

The areas of focus come from my

interpretation, the things that have really jumped out at me from the Keeyask EIS as I was reading it, as well as discussions with Pimicikamak citizens.

I have spent, like I say, through the article nine process and over the past couple of years, a certain amount of time with people in Cross Lake and here in Winnipeg, learning from them about their concerns regarding the hydroelectric development on the Nelson and Churchill Rivers. And so some of the questions have come from what people have raised as their concerns.

My comments also are based on a review of literature on the Nelson River region and other regions of Canada in the circumboreal north. As I mentioned before, I have spent many, many years looking at these issues, and have read quite a wide sort of interdisciplinary range of material on these issues.

And I have spent as much time as I could manage trying to learn as much as I could about the Nelson River in the past two years. I haven't worked in this area before. I had read a number of scientific papers about the effects,

especially on Southern Indian Lake, that were written years ago. But up until a couple of years ago I was not intimately familiar with this river system and with the peoples that live on it.

But my comments are also informed by my own research in other boreal regions of Canada, specifically on riparian vegetation communities, as was pointed out earlier. And I have done some short field visits to parts of the Upper Nelson River recently. Unfortunately, weather seems to be a deciding factor in a lot of the work on this issue. I think we have tried twice with Manitoba Hydro to visit the Keeyask site, and one time we were held back by fire and the other time by low cloud. And so we still haven't -- I still haven't made it up to the Keeyask area.

I have also reviewed literature that's pertinent to questions such as restoration and enhancement of riparian wetlands, sturgeon recovery efforts to date in other regions, and cumulative effects assessment concepts and methodology.

I have also learned a great deal from Manitoba Hydro staff and their expert consultants. I have learned from conversations with technical

experts with the DFO, Manitoba Conservation and Water Stewardship, and biologists working on sturgeon stocking in other regions, as well as the Nelson River.

And I have learned from friends as well. I have a very good buddy in Golden who is a retired engineer and he helped to build the Jenpeg project. He's a fiddle player, and so he's a music buddy of mine and he's helping me to learn how to play the fiddle. But I have learned some things from him about his years spent at working at Jenpeg as well.

I'd like to emphasize that my views are taking a fairly broad view on this issue. And I think that that's really what we do require. And I appreciate the very difficult task that the panel has in reviewing a project like this. It's a very complex ecological, economic, socio, cultural issue to try to sort through, and I appreciate how difficult that really is to come to some kind of a conclusion at the end of the day.

So in my discussions with Pimicikamak citizens, one of the main questions that has been raised is how much more land is going to be destroyed by the Keeyask project?

And of course, one of the main focuses is that there are already so many problems that are not solved with the existing projects. And so people have a great deal of concern over, you know, what are we doing building more projects?

People ask what will be left of this river after all of this development? The river is so degraded now, the water quality, the fish, the birds, plants on the shorelines, insects, frogs and many other animals have declined. And this is over the period of time since the first hydro projects were constructed. Will Keeyask make this worse?

These are based on people's observations. Whether all of these observations have to do directly with hydroelectric development, that is not clear and remains to be determined.

How effective will the proposed mitigation measures be, especially for fish such as sturgeon and for river shoreline habitats? And other fish, of course, like lake whitefish and walleye are a big concern as well. I have chosen to focus on sturgeon. And because, of course, they are so depleted already, that is a very high

level of concern for people.

And will there be any direct or indirect effects of the proposed project on the operation of the Nelson River hydroelectric system as a whole?

These are all questions, of course, that are raised in the environmental assessment process.

In working with Pimicikamak, kind of the history, how impact assessment is done, and how will these questions be asked, is something that we really have to spend a lot of time learning about. And I view this process as something that should be a learning process, an open learning process. None of us have all the answers, and we all need to share the information that we have, the perspectives that we have. We all come at this from a somewhat different perspective as well. And I'd like to see environmental assessment in Canada become perhaps less adversarial and more of a concerted effort to collectively figure out how we can maintain a healthy environment for all of us together in the future.

All the questions that Pimicikamak

have raised, in my view, are very legitimate concerns.

The aesthetics of the environment are very important to people. People have said the land and the river around here used to be so beautiful, but now I can hardly look at it sometimes. It makes me so sad. And this I think is also a legitimate concern.

And when people have looked at the Environmental Impact Statement, the response to the guidelines, there are words such as harmony and balance that are used in there. And so people say, well, if we want to work toward increased harmony and balance in our environment, should we not be working harder to mitigate the effects of the existing hydroelectric development rather than building more infrastructure? And I believe that is also a legitimate question that we should be asking in the context of cumulative effects as well.

And people have thought back about the history of these, of the projects that exist there now as well, and talked about learning as we go along, and so some people, many people that worked on building Jenpeg and the other projects that

exist already on the Nelson River, you know, I have developed some perspectives based on that learning process as well. And people recognize that these choices are very difficult for the next generation. Where will people gain a livelihood? How are people going to work? These are important questions. Is the hydroelectric development a good opportunity for employment for our children in the future? But people have huge concerns about that because they say our grandchildren will not have a healthy environment if more dams are built, or if there's not more done about the existing ones to try to improve environmental conditions.

So we have also met with high school students in Cross Lake, and so these are the kinds of questions that were also discussed there. And people have, you know, they have a really great interest in their future, of course, and what they are going to be doing in the future. Employment with Manitoba Hydro might be an option. Certainly the students were mostly talking about what they have observed in terms of environmental degradation in the areas that they are familiar with.

And so what do we, what do we do if we are going to try to take some of these concerns seriously in this assessment process? How do we reflect also the cumulative alienation and degradation of the Nelson River with each new project? There are certain areas that become restricted access and so on. They might be small areas in the grand scheme of things, but it is also a concern for people.

And I also want to -- I have not had the opportunity to review, for example, a land use study, a current land use study for Pimicikamak, because there hasn't -- one hasn't been done yet. But certainly in my discussions with people, I think it's clear that, first of all, there are many Pimicikamak citizens who do live in the communities that are closer to the Keeyask area. The primary Pimicikamak communities are Cross Lake and Thicket Portage and Pikwitonei, but there are Pimicikamak citizens who live in the Cree, so-called Cree Partner communities, as well as people who do travel to the area to hunt and fish at the present time.

And so people also ask, in what ways will this project contribute to sustainable

development, this concept of sustainable development, and don't we have any other choices for this river beside more hydroelectric development?

I don't think these kind of statements are coming from just being, you know, anti dam necessarily, but they come from some personal experience with the effects in the parts of the river that people are most familiar with.

So the key concerns that I want to talk about today with the Keeyask environmental assessment conclusions have to do with how they are related to the significance of the cumulative degradation of riparian habitats in the Nelson River specifically. The conclusions, how they are expressed with relation to the potential success of proposed mitigation measures for aquatic habitat conversion and lake sturgeon in particular.

MS. KEARNS: I think you need to move forward a slide.

DR. LUTTERMANN: Sorry about that -- and the limited geographical and temporal scope of cumulative effects assessment. And I know anybody who practices environmental assessment is going to

roll their eyes and say, well, everybody says that, right? The geographical and temporal scope is always limited. And you know, what is a reasonable scope is what I'd like to talk about in order to address some of the legitimate questions that people do raise. What is reasonable? Because we're always going to be dealing with financial constraints, with time constraints, that's recognized. It is something that we have to establish early in the process when we scope an environmental assessment, and something that we have to figure out basically in our regulatory environment, you know, what level of effort essentially is appropriate to the task? And that is also a legitimate question. We can't study everything. There is always going to be uncertainty. We just have to decide where the level of effort is appropriate.

And I want to briefly touch on the question of whether or not this, or a major hydroelectric development, and this one in particular, meets the objectives of sustainable development in the context of concerns about climate change on a global and regional scale. And I'm not going to try to address any of these

topics in any kind of a comprehensive fashion, it's not possible with this much time. But I just want to raise a few points that hopefully will contribute to the panel's deliberations, hopefully, have not been raised too much yet. I have reviewed some of the transcripts but not all of them, so I apologize if I'm repeating unnecessarily comments that other people have made.

So with the topic of the direct and cumulative effects on Nelson River riparian habitats, I do believe that the spatial and temporal scope of the assessment could be broadened. I want to talk about the concepts of spatial and temporal overlap in cumulative effects assessment. So this overlap is something which is in the Canadian Environmental Assessment Act. It's part of the purpose of, or the method of scoping cumulative effects assessment, you know, where there is overlap. So I want to talk about those concepts briefly, and how that might apply here and may be looked at slightly differently perhaps.

And I want to talk about the interpretation of the significance of residual

effects on wetland habitat alteration and fragmentation.

And the issue of spatial and temporal overlap, it really is one of the most controversial issues that is being addressed in major environmental assessments across Canada, over the past several years and currently. I'm working as well on the site C project on the Peace River in B.C. and that's a major issue there. So how do we reconcile the different perspectives on that, a project specific environmental assessment and many, many people saying, well, wait a minute, what about the rest of the river system? So how do we reconcile that and how does it make sense within a regulatory context is what I want to touch on.

Okay. And I'm going to talk specifically about wetland habitat, specifically riparian habitats of large rivers.

Okay. And we have understood for many, many years that watersheds constitute important ecological boundaries, right. They are defined by the flow of water essentially. And so if we look on this map, we have this -- this is from a Nelson River Study Board summary report

from 1975. So, you know, it's understood, it's very clear we have a watershed --

MS. KEARNS: Dr. Luttermann, you have to put the laser pointer up on that screen.

DR. LUTTERMANN: So we have here the watershed of the Nelson and Churchill Rivers that are now joined to some extent because of the diversion of the Upper Churchill River into the Nelson River. And so the water is coming all the way from the Rocky Mountains here.

I believe Mr. Chairman had asked a question earlier in the proceedings, a few weeks ago perhaps, about what are the effects of the melting of the glaciers in the Rocky Mountains, and what may be the effects on the Keeyask project? That's an interesting and important question. Certainly, the glaciers are melting at an ever-increasing rate. It's believed to be due to climate change. There's a natural progression that may not be due to anthropogenic effects as well, but, nevertheless, the glaciers are melting.

Once the glaciers have dwindled to almost nothing, it's going to have huge effects on the hydrological systems that are fed by those glaciers. And it will definitely have an effect

all the way down the Nelson River, reducing the input from that source.

But the climate change predictions for the whole region, for this region in particular, predict increased precipitation from rain as opposed to snowfall in the late winter, and wetter springs, and much drier later summers. So that's part of the prediction.

All of this can be tempered to some extent by the storage reservoirs, such as Lake Winnipeg is the larger storage reservoir that will influence the Lower Nelson River. So to some extent, except if we get into very severe drought conditions, at which time the decisions will have to be made on whether to draw down Lake Winnipeg further, well, there's only to a certain extent you can even do that. But, of course, the water that's coming from the whole watershed is not just from the glaciers, but I think it would be a contributing factor. But in terms of how these hydroelectric generating stations in the downstream areas will be able to operate, that will also depend, like I said, on the operation of the storage reservoirs. So there's many other constraints there. I could go on about that.

But at any rate, the point is here that we do understand that watersheds are, to some extent, ecological boundaries, but they are also permeable as well. But can we do a cumulative effects assessment on this whole area? That probably isn't feasible, is it?

But if we look at just the Nelson River area, it might be more doable, especially if we have one institution that is responsible for the multiple hydroelectric projects in that system, the Nelson and the Churchill systems, maybe that's more doable, especially because there has been a lot of research done over the years, like I said, from the Nelson River Study Board. There is some work that could be followed up on, for certain types of habitat change and so on, there are other sources of data. So I think it's feasible to develop a broader scope for effects assessment.

And one of ecological justifications for that perhaps could be if we look at the river system as a corridor, and it's a concept that has been looked at quite a bit by landscape ecologists. So people have talked about riparian corridors as a key landscape feature with

substantial regulatory controls on environmental vitality. So the flow of the water coming down the Nelson River and through the Churchill River now as well basically helps to form that corridor. And ecologists have talked about this riparian corridor as being essential for maintaining regional biodiversity.

And so what I'm talking about in terms of the riparian corridor, not just the aquatic habitat in the river, the riparian area, and I'm sure you have talked about this, it's discussed I think quite eloquently in many ways in the EIS. There's been some excellent work done on this environmental assessment, by the way. I have enjoyed reading the EIS in many ways, especially the work done by the aquatic and the terrestrial biologists.

And so in terms of riparian zone, I want to -- riparian zone basically is the areas of habitat that are influenced by the changes in the water levels and by the, you know, the velocity in the water as well, and how it shapes these habitats on the shorelines, which are different than the upland forest habitats and they are different than the aquatic habitats.

So in a natural riparian zone -- now, riparian habitats are also influenced by the slope of the shoreline, by the aspect, in other words, which way it's facing? Is it facing north or south? On a south facing slope, you're probably going to have a higher diversity of plants or you'll have a slightly longer growing season, so that will influence it. What the substrate is, if it's bedrock or silt or sand or boulders, that will influence what can grow there and how that habitat can be used by various species.

And this is just a conceptual diagram that compares riparian zones in a vegetation structure in different types of reservoirs.

And so in a natural regime, you're going to have aquatic vegetation and you're going to have emergent sedges, and you're going to have grasses and shrubs, until you get up into the upper part of the shoreline where you have the forest.

The lower forest areas in a floodplain are also influenced by the river in that when you have extreme floods, periodic floods, it will bring nutrients and rich soils up into the lower part of the forest, and it will often form a

richer, more diverse floodplain forest. And so those long-term, you know, 20 year flood, 50 year flood, hundred year flood, could be influencing the health of those, or the diversity of those habitats over time as well.

And so when we have reservoir situations, in a storage reservoir -- now, we can't really compare this directly with Lake Winnipeg because there are other constraints. But many of the major northern boreal storage reservoirs, which are operated almost exclusively, or exclusively for hydroelectric development have, you know, major drawdown in the winter time, which crushes the vegetation, doesn't allow shrub vegetation to develop. And then it will be, the water will be stored up through the growing season, rather than decreasing in the growing season which would be the case in a natural river or a lake. And so you end up with very wide shorelines that have very low diversity or structure of vegetation.

And in a control reservoir that may be more similar to Limestone, for example, or Kelsey, they are all slightly different, but in general, if the water levels are going up and down within a

very short range, you don't have this kind of diversity of vegetation structure that develops on shorelines like that.

And then in downstream areas, downstream from hydroelectric development, from a storage reservoir or control reservoir, you're going to have different types of effects on the water flow. And that, you know, it's widely variable depending on how the reservoir is operated.

And so we go back to the concept of riparian corridor -- let's see what I have here. So if we're looking at this whole river system, and you have areas that are essentially reservoirs, and then you have downstream areas, and this area of Sipiwesk Lake is actually flooded all the way up there to different levels from the Kelsey dam, and then you have Split Lake, which also experiences downstream effects from kind of both directions, Churchill River, Southern Indian Lake which is a storage reservoir, and Stephens reservoir which is operated in a peaking three metre wide sort of up and down range. And then you have these downstream reaches like the Keeyask reach and below the lowest dams.

So all of those have different effects and so they result in different structure of vegetation and habitat quality along those parts of the river. And many species move, not just aquatic species, but terrestrial species use these habitats for different parts of their lifecycle, and they move up and down rivers. Not exclusively. There are species that mainly stay close to the shorelines and then there are others that move overland and so on. But because the shorelines in natural conditions have quite high quality habitat, they will be used as corridors.

And with every new, you know, area that is degraded, for whatever reason, whether it be reservoir development or maybe increased sedimentation from poor forestry practices, road development, you know, there can be many different influences on riparian habitats, but all of these can serve to fragment these habitats. So if you have large areas that are poor quality habitat, you're going to have probably less utilization by various species and you're going to have less movement up and down this river.

And so the idea that the riparian corridor provides kind of continuous connected

healthy diverse habitat, I think is an important concept in landscape ecology. And I think it's particularly pertinent to a cumulative effects assessment of hydroelectric development.

So the Keeyask area is already affected by downstream effects from the upstream dams, but it also has -- well, we'll get to that actually in a minute.

So just as an example, this is an area of shoreline on Sipiwesk Lake on the Nelson River, so downstream from Cross Lake. And this area is affected by upstream impacts from the operation of Jenpeg and the control of Lake Winnipeg, as well as this area here is kind of the upper end of -- of what I believe flooding effects from the Kelsey dam can come all the way up to this area. But this is probably the limit of where reservoir effects would be felt here.

But this is naturally a silty muddy bay, this area of Sipiwesk Lake is called Mud Lake. So the water was turbid before hydroelectric development happened based on -- I looked at some historical air photos and I believe that to be the case, but the quality of the riparian habitat here is very, very poor. And

just in an informal survey of 300 kilometres of shoreline, there were only about five species -- not about, there were five species of vascular plants that I could observe along that area, which is quite unusual for a boreal river shoreline with these kind of characteristics. So, I think those are direct effects from the erratic changes in the water levels.

So I didn't mention also the effects of ice scour drawdown as well, which are very important, and those are also affected by the way that the different reservoirs are operated.

So in the Keeyask environmental assessment, the main stem riparian wetlands were assessed. Wetlands in general considered to be valued ecosystem components, and concepts such as the ecological functional complexity and diversity, resilience and uncertainty were discussed in the EIS. And as I said before, I think there are some excellent text in that regard.

One of the statements in the EIS was that:

"All of the natural Nelson River shoreline wetlands in the regional

study area were either lost to flooding or have been altered by modified water and ice regimes."

So all of them. That's a pretty, you know, significant proportion of what may have been there before.

There was an analysis done of historical air photo imagery in the lower Kelsey reservoir and Gull Lake Kettle reservoir, and then the Long Spruce reservoir. So they did take a broader look to try to understand what the quality of the -- or the vegetation cover essentially would have been in these reaches before the first hydroelectric developments. And they concluded that well-vegetated shorelines in the main stem constituted a relatively small percentage of the riparian zone before hydroelectric development.

This is probably not -- this is probably, this makes sense, that kind of conclusion. Especially in that area of the river, it's a narrower channel, it's not nearly as meandering and spread out, not as many islands and so on as in some of the other upper parts. It's also in the downstream area of a river that's flowing north. And if you think about a river

flowing north, you're going to have spring melt breakup earlier in the south than you do in the north. And the effect of that can be, and this has been observed in other rivers that are flowing north, is that you have increased -- larger ice scour effects than you might in a river that's not flowing north. So you might not have as, you know, as many stable riparian habitats as you might in some other rivers.

But regardless of that, riparian habitats typically form only about 1 percent of any region, but they are generally found to represent some of the most productive habitats in the broader landscape. So even if it's a small percentage, it is still, these areas could still be considered important, especially if they are connected along a riparian corridor, along a river system which allows species to disperse over time and increase their resilience.

The riparian habitats of main stems of large rivers are typically more species rich in plants than smaller rivers in the same region. And this is based on work by Christer Nilsson out of the University of Umea in Sweden who has been doing work on boreal rivers for many, many years,

and comparing the characteristics of vegetation communities in reaches of rivers that are affected differently by hydroelectric development.

And so this picture I put in here is from the Lower Churchill River in Labrador. This particular area, I believe there were 85 species of plants that were growing in this portion of the riparian habitat.

So one question I guess I had too about the environmental assessment of the riparian zone habitats is that it's acknowledged in the EIS that the Nelson River is not a naturally functioning ecosystem, river system, that the Nelson River riparian wetlands have been modified beyond recognition. However, the reaches that would be flooded by the proposed Keeyask project are still influenced by riverine hydrological processes, especially when you think of the tributaries that are entering, the mouths of the tributaries will get flooded and scoured to some extent, depending on the high water levels in the main stem of the river. But there's still a natural seasonal flow of water coming through these tributaries that should contribute to more natural riparian habitats.

I don't believe I explained very clearly, or at all before about the seasonal patterns of water flow. And you have probably talked about this at these proceedings already, but it's one of the most essential effects that hydro development has is changing those seasonal patterns. And that is one of the most important drivers of the diversity, the quality and the utility of riparian habitats.

So in regions -- in the environmental assessment, it says:

"In regions that are in a relatively pristine condition, it is anticipated that some degree of area loss can be absorbed without adversely affecting ecosystem functions."

So the idea is that we can accept some loss in the context of abundance. And this is always one of the central questions in an environmental assessment, and a cumulative effects assessment is, is this going to be the tipping point? Is this going to be the straw that breaks the camel's back or not? And so we have to establish thresholds of effects and, you know, at what point do we cross a threshold? Is a

threshold the extinction of a species or is that just -- that threshold is probably unacceptable for most people, that's going way too far. We want to have healthy habitats that are not anywhere close to extinction of species or regional populations.

So this statement is probably mainly referring about the pristine habitats. So it's acknowledged that the main stem river habitats are not pristine. What is pristine? Pretty pristine is mainly the bogs and the fens. There are extensive bogs in the region, which are wetlands, important wetlands, but they are very, very different from the riparian wetlands on the main stem of a river.

So, in this assessment we have to be careful, I think, about what we're talking about here in terms of idea of pristine condition. And we don't want to get into situations where, you know, the sturgeon, they were huge, there were lots of them, we had extensive commercial fisheries, and now there's very few left. And that's what we're trying to avoid is a situation where we have over exploitation. It's a lot easier to see if you're looking at a particular

species, or if you're looking at old growth forests, for example. On the West Coast of British Columbia, some of the largest, oldest stands of trees in the world that are not seen anywhere else, and it's anticipated that except for a few pockets of protected areas, these will all be gone in 30 years. And just a few years ago, people who are out there cutting these trees thought that's impossible, there's too many of them, we couldn't possibly as humans have that kind of an effect on our environment. But I believe that we have to keep that in mind, that we can have that kind of effect on the river systems as well as. It might not be quite as obvious.

So we know that there has been extensive loss of main stem repair and wetlands in the Nelson River, and there's been virtually, well, very little to no mitigation for this in other parts of the river to date, I believe, based on what I have been able to understand from the documents I have reviewed.

In the EIS, the Nelson River shoreline habitats are described as non-native wetland types. And so that's quite interesting, to the extent to actually get to go describe them as

non-native, you know, habitat types. And this is a direct result of the severe effects of existing river regulation. But one of questions I really have about this is then, if this is the case, we don't have a pristine environment, we have specific habitat types that are known to be very rich in most systems, most boreal rivers, this is the case. But there isn't any further consideration of the possible landscape level effects of the degradation of these habitat types throughout the river system.

To me, this is one of the most important points here, in that if we think of the river as a riparian corridor, that it makes some sense to really take a broader view of this.

And there is no further consideration for the potential for mitigation for existing effects. And this is something that I believe should be given far more consideration when we're looking at cumulative effects, is what is the opportunity cost? When we convert another reach of the river, which is still, it is already altered by hydroelectric development but it still has a diversity of habitat that will be changed if you convert that area into a reservoir. And when

you convert that area into a reservoir, you are essentially changing the opportunities for mitigation for existing effects in that area, in that in many, many river systems throughout North America and Europe, people are looking at how to change, alter the flow of existing projects in order to improve habitat conditions in reservoirs and downstream. But especially for downstream areas, there's more opportunity there. And so if we think of cumulative effects, I think that this is one question that should be taken into consideration, is what are we basically precluding from doing in the future for this section of the river?

I think in the EIS, it mentions that people in the area recognize that nothing can be done to repair the damage that has already occurred. I don't accept that statement that nothing can be done. I don't know for sure if we can change, you know, from an economic perspective what can be done, but I think it should be investigated.

So what is the appropriate regional scope of assessment? So this, again, is in the terrestrial environment section two in habitat and

ecosystems. The rationale for choosing the study area was that:

> "Focusing on particularly important wetlands for evaluation and mitigation is an appropriate approach for this project assessment, since the project is located in a region with extensive wetlands that are in relatively pristine condition,.."

so I mentioned that already,

> "...except along the Nelson River."

So, again, this is all recognized in the EIS. I don't think, you know, it is a surprise to anybody. But then if these habitats are rare in that part of the river, and if they are degraded in the whole part of the river, maybe the regional ecosystem should be broader for the level of assessment of main stem riparian habitats.

Again, they mention that this regional ecosystem is appropriate scope, geographical scope to assess the effects of development on wetland function in a naturally functioning ecosystem, which we recognize it is not. And then also it says:

"In most cases the development will affect a very small proportion of a regional wetland area and so the focus is on screening technique that identifies wetlands that are particularly important for the regional level ecosystem."

So, again, we have to think about what wetlands we're talking about, whether they be bogs or fens, marshes and swamps. The types of wetlands that occur on the main stem and up the major tributary mouths and so on are not widespread in the region, and they are specifically affected by hydro development, and they are incrementally affected by hydroelectric development along the whole river.

So, for an environmental assessment, I believe that some of the important ecological questions should include what remains of the former riparian wetland habitats in the main stem of the river and tributaries -- so what remains of the former wetland habitats in the main stem of the river as a whole, and the tributaries directly affected by regulation?

And this is a question that people of

Pimicikamak keep asking. And we'd like to understand this better, because from what we see, there has been a lot of pretty major effects. And that's what people talk about probably more than anything, are the fish and the shorelines. What is the condition of these areas at the present time? What are the implications for biodiversity and functioning of the riparian corridors of these large rivers?

And so, you know, you've got reservoir here, you have downstream effects here, you know, how has this river been fragmented in that way by the degradation of the riparian habitats?

But, again, we have to figure out collectively, I believe, what's an appropriate level of effort to assess the significance of this Keeyask project within that context? It's not necessarily an easy question, but I think we could think a little more broadly on it.

So in the Canadian Environmental Assessment Act, and various guidelines and so on in projects, we are asked for cumulative effects to consider spatial and temporal overlap. So if we're going to build a project, does that happen right on top of an effect that has already

occurred, and is that going to make that effect worse? That would be a cumulative effect. That would be one way to look at it. Is it going to happen in the same space of time as an effect that already exists, or something that's going to happen in the future? So that's another way to look at it.

The effects on the characteristics of river shorelines are one of the most apparent and direct consequences of river regulation, and this is a pathway of effect essentially. So, again, the vegetation structure, plant species richness, suitability for riparian wildlife species, and that's for obligate species and occasional users, are all directly affected by this pathway.

And the natural seasonal flow patterns of water, the sediment transport are main drivers that form and maintain the complex morphology and habitats typical of large rivers. So you have little bays, you have islands. This picture is from the Labrador upland plateau, quite harsh environment. But in this river system you have marshes along the shorelines, point bays, these are all formed by the flow of water.

So I mentioned that the guidelines

refer to overlap. And the reason we do this, we want to look at cumulative effects so that we can understand better what are the incremental and possibly synergistic effects of multiple effects on the environment? So, synergistic meaning two effects don't necessarily add up to double that effect, but they might actually be worse, especially the compounding effect might cause the extinction of a species, for example, for an extreme example. But we have to understand how effects are working with one another essentially. So you have two different type of habitat effects that could work together to actually have further degradation.

That doesn't explain it at all, but let's carry on.

It's acknowledged in the EIS that the project effects don't need to overlap completely with a valued ecosystem component in order for the boundary of that VEC to be used as a study boundary. So that's understood. But we could think about meta populations that could be important to address the long-term effects of fragmentations. So we might have a population to make it simple of caribou, but maybe some of them

will stick together in a small herd. So do we have multiple effects on that one herd? But a meta population would be many herds of caribou in a region. So if one is affected by disease or an event like a major fire, or over harvesting and they all get killed at once, that area could be re-populated by caribou from other areas, right. So we're talking about multiple populations that disperse and feed into each other and help each other recover over long periods of time especially.

So, one of the points of doing cumulative effects assessments is to understand what the incremental loss of good quality habitat over large and previously connected area of landscape might be. Also coupled with barriers for dispersal, so, you know, your road, you have a reservoir which is harder to cross perhaps in the summer time for some species than a river might have been previously. We have to look at those possibilities. That could result in cumulative effects.

So the importance of habitat connectivity along rivers is a very, is a concept that's been looked at by a lot of people. I think

I mentioned this part already. I don't have to mention that again.

I just want to give one example of the northern leopard frog. Somebody mentioned that this has been, that the northern leopard frog was raised in a discussion earlier in the proceedings here. And somebody suggested that there aren't any northern leopard frogs in the Keeyask area, and so maybe that's not relevant.

Certainly, the distribution maps in the EIS suggest that the Nelson River may have been a corridor along which frogs disperse north of Lake Winnipeg, not just northern leopard frogs but a couple of other species as well. The maps that are in the EIS, and I'm sorry, I didn't put one up here, they show records of observations of these species along the major rivers. It doesn't necessarily mean that they have dispersed along those rivers, it may be just an artifact of where the observations were made, if there were more people observing along the major rivers as well. So I can't read too much into that.

But I looked at some of the distribution maps. The Keeyask area is right at the very northern limit of their leopard frog,

northern leopard frog range. So whether or not they exist there right now I'm not sure is entirely relevant. That what's relevant is the fact that frogs were formerly abundant in the Nelson River riparian areas, according to observations made by Pimicikamak elders and others, that post Jenpeg is cited as a time period when frogs began to disappear, but there were dramatic declines in the abundance of frogs all over the world in the 1970's and '80s, and certainly in Canada as well. So whether or not that decline is attributed to Jenpeg is not necessarily -- well, it's relevant, but we have to understand that in a broader context. If we had only studied the Jenpeg area, we wouldn't know that, that there were other factors, possibly disease, habitat loss are expected to be a factor in that decline.

But what has happened since then is I think a question of interest here. So the northern leopard frog lives in marshes, so fresh water marshes, not in bogs which are acidic, is one difference. They need abundant aquatic vegetation. They also need moist uplands. So they move from the marshes into the uplands and

then back down again. So they need moist uplands adjacent to the marshes. And they need overwintering habitat with stable water levels. And they need fairly close habitat connectivity, because when they disperse -- so let's say a small local population is wiped out completely by predation, by disease, by habitat loss, in order to repopulate a larger region, they need to have good quality habitat in close proximity to one another, because they can only disperse maybe several -- I can't remember exactly the distances. But they can't travel a hundred kilometres down to find the next patch of good habitat. So they need to have some continuous habitat in order to repopulate regions, if they have declined over a certain period of time for whatever reasons.

So this would be part of what you might call resilience of a population if they are able to re-populate in areas.

So the northern leopard frogs in other parts of Manitoba have increased considerably in the last 30 years following these die-offs. And that information came from a western and prairie recovery management plan for northern -- leopard frogs, it was western boreal and prairie

populations that they talk, which are considered to be a species of special concern.

And they don't talk about the Northern Manitoba on the east side of the Nelson River. And I don't believe that there has been very much study of what the populations of this species is, species is in that region.

But a question we could have is, to what extent has river regulation in the Nelson River influenced the ability for these populations, or influenced the status of these populations in combination with other factors? We don't really know that, I don't believe. To what extent does the degradation of the riverine riparian marshes and the barriers, the dams on the rivers, affect the ability for the species to rebound in the region? It's a question we could ask in the context of a regional impact assessment. I think it would be an interesting question to pursue, because amphibians are often used as indicators for habitat quality as well.

And then we could ask whether the habitat conditions could be mitigated if the water control system was operated differently?

So, those are some reasons I think

that it would make sense to view a naturally functioning riparian corridor as a valued ecosystem component in an EIS, even for a project specific assessment.

Because river corridors, they are the only dispersal travel route for aquatic species, of course, unless they are moved by people. Although it's kind of interesting, you know, eagles can pick up fish and drop them back down again and they are still alive. So they can actually transport them a certain distance as well possibly, but probably not to re-populate, or to change their range distribution.

But this idea that a naturally functioning riparian corridor could be used as a VEC, I think is particularly appropriate for river systems that are regulated by dams and impoundments.

So measuring fragmentation. I think what we will do is, in the interest of time, I'm not going to blather on anymore about that, but we could discuss it later if you like.

One point, the scale of cumulative effects assessment, I believe, needs to -- and the mitigation effort needs to be equal to the scale

of the hydroelectric system as a whole. So in the Peace River area, for example, the mitigation for loss of wetland habitat from a new dam that's being proposed there, they are looking at mitigation in the broader region, so wetland habitat enhancement and creation, and even as far as the whole province in compensation for wetland losses in the Peace River area. And that's something that could be considered here as well, although that doesn't address the local concerns.

So let's move on quickly to the mitigation for effects on sturgeon and cumulative effects.

The concerns I have about this, again, I think that a lot of the work that's been done on this is excellent and innovative. There's been a lot of thought put into this, mitigation for sturgeon. But I have concerns about the way that the conclusions are expressed, at the end of the day. The eventual success of fish habitat enhancement at Keeyask to replace lost habitat is not guaranteed, of course. I think that the sturgeon stocking program will face many challenges in rebuilding self-sustaining populations, and the conclusion of no residual

effects with a high level of confidence is optimistic. And it's good to be optimistic. If this project is built, I truly hope that these mitigation measures will work well. But we cannot conclude at this point that they will work for sure. The species is severely depleted and there's limited mitigation for the effects of existing hydroelectric infrastructure on the Nelson River as a whole.

It is known that Conservation stocking -- well, it's been suggested by the DFO habitat recovery assessment that conservation stocking shouldn't be considered as a substitute for other measures to address habitat degradation. So, in the Keeyask, the other mitigation measures that are proposed or suggested, one is to adjust water management operating conditions of dams. This is part of the habitat enhancement shoal creation that is being looked at just for the operation of the Keeyask project, and it's an interesting approach to that; the water management of one of the tailraces in the north part of the river; rehabilitation of habitat in key areas to mitigate habitat degradation or loss of important habitat such as spawning sites, and improvement of

age zero and juvenile survival. So that's another suggestion by DFO. And this is being investigated, and there are some good ideas surrounding this and good plans.

Ensuring the design of new dams and modernization of existing dams does not jeopardize the survival and recovery of lake sturgeon. So considering the need for fish passage. This is also being looked at. It's planned only if the other mitigation measures do not seem to be working.

But the last suggestion is to protect spawning and rearing habitat. And what we know for certain in this case is that we will be destroying some existing functioning spawning and rearing habitat. That's a certainty. The mitigation measures are not a certainty.

The Keeyask project, I'll just give some very briefly examples. The Pointe Du Bois spawning shoal creation. So the Keeyask project assessment is going to apply lessons learned at the Pointe Du Bois and other sites to attempt a spawning shoal creation in the tailraces of the new generating station. This is a very important initiative. But there are many physical

differences between these two stations that the Keeyask project will try to address. So, again, the physical differences are recognized, you know, some of them, some of the most obvious ones of course. But, you know, every system has myriad differences and we can't be sure that we are going to capture all of the most important differences. Again, there's been I think good effort made in this regard, but we don't know for sure if the lessons learned from Pointe du Dubois will be directly applicable to Keeyask, and whether or not there are not other factors that we are not accounting for in the behaviour of those populations and in the functioning of this system.

So stocking as a conservation -- and so the next major mitigation measure is the stocking programs as a conservation strategy. It certainly may be an essential tool that's required to rehabilitate selected lake sturgeon populations.

> "A stocking strategy has the potential to have negative effects on wild populations and should only be applied where a strong biological rationale exists and where other strategies have

been deemed unsuitable for achieving management objectives."

So this is from a report by Smith in Ontario that did a review of stocking programs.

And again, this is recognized in the Keeyask EIS. So stocking is only one part of the mitigation measures, and a number of the challenges with the stocking programs are being considered and investigated.

One strategy that could be considered, though, is the protection of the remaining functioning habitat on the Nelson River, but that would preclude building the Keeyask project.

One example that's given in the EIS is the Wisconsin Department of Natural Resources, which is viewed as a model of one of the most progressive stocking programs and is cited as a region where success has been achieved, one of the largest self-sustaining populations of lake sturgeon in the world. It's controlled by two dams that were built in 1850 and 1930. But this system is regulated with a number of different objectives. It's flood control, reduction of ice damage to private property, release of water for hydropower, and pollution dilution downstream, and

to extend the high water season for boating. So there's many, many different management objectives there. It's not just producing hydropower.

Now, I apologize for this, and I wanted to put this in the presentation to explain about these two graphs. They are not meant to be viewed as a comparison. The one on the left shows a daily water level in feet, and the one on the right is a daily discharge in cubic metres per second. So please don't -- I realized after looking over that written presentation, written submission that it could be misunderstood if we look at kind of the shape of these graphs together.

But the point really is that there are many physical differences in the Lake Winnebago system. And I think Dr. Stephen Peake pointed out that the differences in the regional climate could affect the way that the sturgeon respond to different manipulations of the system and to the stocking program. So this is -- we're not able to really comprehensively do an analysis of this, but to just point out that with every new system, we do have new challenges. And I think from a scientific perspective, we would never, with the

amount of evidence that we have, be able to conclude for certain that something that's worked in one system is going to necessarily work in a new system.

So reservoir operations and sturgeon recovery, Lake Winnebago -- so I'm going to skip over that because I'm not going to have enough time.

Another factor is the water quality in the river as a whole and how that maybe differs from other systems where stocking programs have been put into effect. And we know that Lake Winnipeg is experiencing increasing problems with nutrient inputs from agriculture. And whether or not this has an effect on the downstream water quality over time in the Nelson River needs to be examined further. That's just one other element that might be different in the system from some of the other rivers where stocking has been done.

With Great Lakes sturgeon recovery, Great Lakes is another area where sturgeon stocking has been done. The populations are estimated to be about 1 percent of the pre 1850 numbers. This is very small, obviously partly due to over harvesting, as well as that's the case

everywhere else.

The International Joint Commission has -- I just put a conclusion from a recent report that says:

"While recent spawning success in the Detroit River and other traditional spawning habitats is encouraging, recovery cannot be assumed."

And in that system is simply a way to show that in systems where we had been working people had been working very hard for a long time on stocking, it's still in the early stages of trying to understand how well recovery is going to happen.

And this is just an example of a recent press release from August of this year which says that, it's the Department of Environmental Conservation:

"Lake sturgeon restoration efforts are achieving success."

And the success that is reported in this document, again, it's just a press release, it's just a summary of some research that has been done, but the researchers have captured two wild juvenile sturgeon in two different locations. And this is

evidence of reproduction from stocked fish. So that's really good. They had been stocking for a number of years and they are starting to see some evidence of reproduction. But they have caught two wild juvenile sturgeon that could go on to mature and reproduce themselves, so these are stocked -- but it's pretty small results so far but it's promising. And, again, I'm trying to emphasize, I'm not trying to suggest that there aren't some promising -- there's not promising evidence, but it's fairly small. The first wild sturgeon that was caught in this Oswegatchie River in 30 years. So these were the first wild ones caught in 30 years. They had gone down to nothing before that.

So my point here really is that this is evidence of success, and it's excellent, clearly stocking had to be done in that area. But what exactly are our objectives here? Do we want to get down to that state in the Nelson River? And we certainly don't, and we're not there yet, but we want to look at our broader objectives for the longer term in terms of a healthy functioning ecosystem. And we want to understand how much evidence we have to date about the success of

other programs.

So, in terms of the Upper Nelson River, there is some spawning that's still occurring, but recruitment is very low. We don't really know if habitat is a limiting factor or are there simply too few individuals left to repopulate? Habitat factors are not well understood but they are expected to be important. The survival of the Young-of-the-Year is in question.

Whether or not that's related to habitat, again, we're not sure about that.

The efforts on the sturgeon stocking program on the Upper Nelson are important and they appear to be making progress, however, there are many challenges and questions that remain. And little work has been done on addressing habitat loss and degradation in the Upper Nelson. There has been some habitat assessment that has been done, I understand, and I have not seen the reports from that work.

So is habitat limiting sturgeon recovery in the Upper Nelson River, whether it be due to hydro projects or other factors? I know that the fisheries biologists believe that it

couldn't be a limiting factor to population growth because some fish are surviving. There is some indication that growth rates are normal growth rates. And so in other words, they don't reflect a food shortage. But there is an argument to be made for much more analysis of habitat conditions and opportunities for enhancement in these regulated reaches.

And I also believe that some of the, you know, the releases of the stocked sturgeon have been in the Sea Falls area, which is the east channel coming out of Lake Winnipeg, which is not regulated in the same way that all of the downstream areas from Jenpeg and the Jenpeg Forebay are.

So this is a sturgeon fingerling at the rearing facility at the Jenpeg adjacent to the Jenpeg Generating Station this past fall, and they are being fed blood worms.

The sturgeon stocking program for the Keeyask mitigation. So a stocking program to attempt to recover sturgeon populations is likely a necessary and prudent conservation initiative, in the Keeyask area and other areas of the Nelson River, and this is what is being proposed. A

25-year period, along with monitoring to determine whether hatchery raised fish are reproducing in the wild And this is excellent to be taking a long-term approach to this and making a commitment to that. But at the present time, to what extent can we conclude that stocking will necessarily result in self-sustaining populations capable of supporting domestic harvest in these reaches in the long-term? That's the objective, I believe, that is stated. There is uncertainty surrounding this conclusion.

So, the effectiveness of the sturgeon stocking programs in the Nelson River, upper reaches of the Nelson River is, I believe it's stated that they are seeing that these are effective. Maybe that's not the exact wording that's used. There definitely is -- that needs to be acknowledged, there's increasing local expertise in sturgeon culture, both with the spawn collection and rearing at the hatchery. There have been recent improvements apparently made at the hatchery. But when you look at the evidence as a whole, really it suggests that the initiatives are still at quite an early stage if we're looking at long-term recovery. And we have

not demonstrated that stocking will re-establish self-sustaining populations. So I believe that additional work should be done to more clearly establish the extent to which habitat is a limiting factor in the recovery of lake sturgeon.

If we, you know, stocking programs, of course, if you continue to stock year after year after year, you're going to have increased numbers of sturgeon. That doesn't necessarily give you a self-sustaining population.

There are challenges at the Grand Rapids hatchery, and these have been discussed, and there is work being done to try to address these challenges. Successful rearing has not been accomplished every year. I believe it's been stated that whatever issues are related to that have been solved. Not sure if that's the case. But I don't know that any hatcheries anywhere would say that they have solved all the problems into the future that we can be sure that we're not going to have die-offs in the hatcheries in the future.

And when we're looking at a multi-year construction phase where we might be having a severe impact on existing populations in the

Keeyask area, it's pretty important to have good success every year. Because collection of spawn from females, when you have a small number, is challenging and spotty. They have introduced use of hormones to induce spawning in 2011, but there's been death of female sturgeon that were used to collect spawn, and they changed the use of particular types of hormones in 2013, so it has just been this past year. Again, that is looking promising, but that's pretty recent to have introduced a new method, and hopefully it works, but it's pretty recent, I guess, in terms of we're looking at weight of evidence here, in terms of what's going to work in to the long-term.

I'm not sure, Mr. Chair, if I am going on too long if you wanted to have a break at a certain point in time?

THE CHAIRMAN: Well, I wouldn't break for a few minutes. But perhaps if you could abbreviate some of what remains. There's still almost half left.

DR. LUTTERMANN: Okay. Never mind recovery.

So the basic conclusions I have are that the EIS, about the sturgeon, is that the EIS

expresses a high level of confidence that mitigation measures including habitat enhancement and stocking, will be successful. It's been suggested that the sturgeon will be better off with the project than without it, because of habitat enhancement and large scale stocking.

And it emphasizes that the project will increase sturgeon populations and the information collected will add to the knowledge of the province. And my feeling about this basically is that there is still a great deal of uncertainty. The weight of the evidence suggests that the measures are still at an experimental stage in other regions, although they show promise. And if these measures are successful with Keeyask, it will be, I think it needs to be recognized that it would be in spite of project, not because of it.

Unless we understand that, the financial commitment to a long-term stocking program and habitat mitigation in the river would not be done unless Keeyask is approved. And if that's the case, then maybe you could say that. But mitigation for habitat loss in other parts of the river has been fairly limited. And there's a

concern that the commitment to Keeyask might in fact reduce the -- you know, a wider stocking program has been proposed, but in terms of habitat enhancement, it would give me more confidence if we had, maybe over the last 10 years, tried constructing artificial shoals in areas where spawning habitat has been destroyed in other parts of the Nelson River to date. And the reasons for not doing that, maybe we could discuss that more, why that perhaps hasn't been done. Maybe there's good reasons for that. But it would give you more confidence that it might work in the Keeyask area. And of course, every single structure is quite different as well, but other factors might be more similar than in areas further south.

And so really what we're looking at here is a decision that needs to be made about whether to risk additional habitat loss, which is certain. Given the endangered status of this species in the river at the present time, it's not endangered under Species at Risk Act yet, but it's being considered as such. And regardless of whether it is or not, I think that we have to understand it in that context. We have a certain habitat loss weighed against an uncertain

mitigation. If the project goes ahead, absolutely the mitigation measures that have been developed should be implemented in earnest and hopefully they do work.

I want to just make some very quick points here, I guess, so that I don't take up too much of your time.

This is an old map that came sometime in the early 1970's of the Hydro -- of this system. The dams at the time, the Gull Generating Station and the Birthday, there were two generation stations considered at the time based on probably early engineering work. And they suggested at the time maybe 560 megawatts at Gull and 540 megawatts at Birthday. And now we have one which is I think 695 that's being proposed. I don't know how, you know, how accurate this -- this is just sort of an early configuration that was proposed.

Climate change. I want to make just a basic point about, if we look at this project in terms of what the benefits are to climate change. Why do we fear climate change? We fear it because of extreme weather events such as drought, increased precipitation and severe weather events

causing flooding. I'm sorry -- this is number 55 and I'm kind of skipping ahead here -- habitat change, melting of permafrost, invasion of non-native species and unpredictability of weather. These are some of the things that people fear about climate change. And depending on where you live -- I live in a floodplain as well -- you know, climate change is a real concern for people and also especially in coastal areas. So if we want to build a project that will help to reduce the emissions of greenhouse gas as proposed that this hydroelectric project is proposed to contribute to that, we need to consider not just the global effects and the regional effects, but the local effects of the hydroelectric development itself.

So in the regions that have been directly affected by hydro development, we have drought essentially in areas that are de-watered, that is what it amounts to. We have flooding. And so this is an area of the Sipiwesk Lake where you can see it's about three and a half kilometres from the top to the bottom of this air photo in 1946. And this is just a recent Google Earth picture. So you can see how much of the more

complex riparian habitat has been flooded. And it's all quite homogeneous in this area. All those areas are underwater. And so that's local flooding which is pretty much permanent.

You have habitat change, and we've talked a little bit about that, in very extensive areas. And you have possible contribution to the invasion of non-native species. There is a hypothesis that the carp -- and I'm sorry, I haven't put the reference on here -- but there is a hypothesis that the common carp may be facilitated in their occupation of habitat in the Nelson River because of the changes in the near shore marsh conditions. I won't get into that, but that's a hypothesis, but it's a possibility.

And climate change, increased drought, these are just a map of the recent fires this past summer in the Keeyask area, which burned, according to the Manitoba Conservation fire site, about 1,800 square kilometres, and that's just actually, I added it up from just this area here, so not including these fires. So it's extensive right around the Keeyask area. And I know it's been discussed a little bit, and whether or not there's any effects on the conclusions of the EIS,

it depends on how intensive those fires are as well. But in terms of climate change, we could be getting increased drought conditions in the area.

I just put this graph together based on the data, from the recent data from up to 2013. It looks as if, from this anyway -- this is the total hectares that are burned per year in Manitoba. And some of the earlier data may not be as reliable, of course. But it's possible that we're having increasing area burned every year, which could be an effect of climate change and could in some respects be a cumulative effect of habitat effects, basically, in combination with hydro development and forestry potentially.

But this is what I wanted to get to is unpredictability, the issue of unpredictability in climate change. And we already have a lot of unpredictability in certain areas of the Nelson River that have a particular impact on Pimicikamak. And so don't worry about the scales on these graphs, this is just a selection of a number of different years of the water levels in the Cross Lake area. So it's directly influenced by Jenpeg. And so this is 1958, pre Jenpeg. And 1960 shows kind of a more or less natural kind of

hydrological regime throughout the seasons, fairly stable water in the winter time and then the spring frechette, and then fairly stable but going down through the summer time. And that's a fairly natural pattern that you see in a lot of boreal rivers.

And then when you get into the stages where the hydro projects are being constructed upstream in Jenpeg, we have some sort of scanty data there at different times, but the patterns start getting quite erratic, and these effects may just be the construction period, so I'm not sure exactly what's going on there.

But then we move to 1979, so post Jenpeg, then we've got these really high, higher water levels in the winter time. And then we have still a spring frechette that year, 1979. And then it just plummets down really low in September. And freeze-up is maybe around October, and then the water levels are going way up at freeze-up time, and so maybe overflooding over ice that I think Darrell talked to you about yesterday a little bit. And then 1980 we've got something completely different happening. And it's just all over the place. In 1981, again, we've got water

levels coming way down in the winter time, and that would have, you know, crushing effects on the ice. The muskrats would have their constructed homes possibly crushed by the ice so they might be frozen under it. And then 1985 is something completely different again.

1990, one of the things that was done was a weir was built at the outlet of Cross Lake to try to address these very low water levels that were happening, and that was in 1990/91. And since then, the water levels have been higher to some extent. But still the seasonal patterns are different practically every year.

And if we go up through the 1990s, and of course this is influenced by the inflow into the whole system as well, but then at Jenpeg they were making decisions on what is the most economical way to use the water, essentially, downstream? And so because there are fewer constraints, there's constraints on how Lake Winnipeg is operated, how some of the downstream reservoirs are operated, commitments to various parties throughout the watershed. The Cross Lake area has relatively few kind of commitments for controlling water levels within kind of a

reasonable range. So into the 2000s, we've got higher water levels now from the weir, but then we start getting up into crazy high water levels that are record high water levels. We have had some very wet years. But the Cross Lake area is the area that experiences probably the most variability.

And this is where -- when we talk about whether or not there will be system impacts from Keeyask, and I believe that the statement has been made that, basically the conclusions is that the changes in the water levels that are associated with the addition of Keeyask are not expected to be discernible or detectable in the context of existing water level variations in the water bodies downstream in Lake Winnipeg. So we're talking about the Cross Lake areas, Sipiwesk Lake.

So what does this mean, this statement?

Now, certainly we can see from those graphs that the context of the water level variations is one in which there are no yearly, there are no trends really from one year to the next. It's extremely variable. So if we're going

to try to monitor this after Keeyask is built over time, what is going to be the effect on the Cross Lake area, how can you possibly sort that out? You really can't. Whether or not they will be, you know -- if we have really wet years, we could end up with even higher floods in Cross Lake, because the Jenpeg infrastructure increased the potential outflow from Lake Winnipeg up to 50 percent. And so Cross Lake could very well experience higher water levels because of that station than it ever did in the past. I think this maybe requires a little more investigation to try to describe that a little more clearly, that effect.

So there's already significant variability and unpredictability from season to season and year to year. And what could Keeyask do to that? It's going to be difficult to figure out what the -- if there's any kind of a pattern. Because, partly because depending on the inflows into the system you might have a dry year one year, you might have a wet year the next year, depending on the season the water comes into the Lake Winnipeg system.

Manitoba Hydro has to decide what is

the best use of that water within the constraints they have to operate in. What is the best use?

If you have increased capacity downstream at Keeyask, you basically have more revenue sitting there, you've got more money sitting there. Right? And you've got several other generating stations downstream as well. And so the modeling that takes place is looking ahead a couple of weeks and also, you know, through the year, when is the best time to sell that power? When is it going to make the most amount of money? So you might want to hold back water in Lake Winnipeg during a time you're not going to make as much money, and then release it when it's more profitable to do so.

Keeyask basically increases the, kind of the economic imperative downstream of the whole system, and I think could, you know, it probably will have some effect on the water levels in Cross Lake. Now, whether that's a positive effect or a negative effect, or one year it's positive, one year it's negative, is almost impossible to tell because the whole system is so variable.

But the point about kind of arguing that this project is a good thing from the

perspective of climate change benefits, I think, has to be looked at in the context of all of the habitat degradation, the unpredictability that has happened on a local and regional level, instead of, you know, taking too simplistic a view of the benefits with regard to climate change.

In addition to the fact that I'm not so sure and, you know, I haven't delved into this, but I'd like to see some fairly clear evidence that the power from Keeyask would directly offset coal-fired generation in the U.S. If it is fed into a market and the prices of coal, apparently Europe and Germany right now where people are really against burning coal, coal is being used more recently because the price is so low right now. And so will Keeyask actually offset greenhouse gas emissions or not? You know, if there's an agreement to that effect, it would make the argument about the climate change benefits perhaps stronger.

THE CHAIRMAN: Dr. Luttermann, I think we will take a break now. We'll break for 15 minutes and come back at about 25 after 11:00.

DR. LUTTERMANN: I will try to finish up within a short period of time after that then.

THE CHAIRMAN: Thank you.

(Proceedings adjourned at 11:10 a.m. and reconvened at 11:25 a.m.)

THE CHAIRMAN: We'll reconvene. Dr. Luttermann.

DR. LUTTERMANN: Thank you. Are we ready to go?

THE CHAIRMAN: Yes.

DR. LUTTERMANN: Thank you for your patience. I have a terrible habit of going off on tangents. So I was taking more than my allotted time, and I'll try to finish up fairly quickly and then we can have some discussion.

So within the general topic of sustainable development that we were talking about, and I want to emphasize here that when we're looking at this system as a whole, which Keeyask would be part of, right now there are water level constraints within the existing licences for the Nelson River hydro infrastructure, but these are primarily maximum and minimum levels in the reservoirs, and some flow constraints below control structures such as the flows that are going into the Lower Churchill River. And there are some restrictions on the

rates of change that are permitted to meet certain values. But for the most part, there don't appear to be any, or many stipulations for water control that relate seasonal ecosystem needs.

And so here at the Clean Environment Commission we're talking about environmental protection. So the system as a whole doesn't make very much effort to look at seasonal ecosystem needs which form and maintain the rich river habitats. As well, it's not just the habitats but it's shorelines that people have used for millennia that form a part of the cultural landscape for all of the peoples that have lived along this river. The islands, the bays, the camping spots, the burial spots, this is what is the cultural landscape, the home of the people that have lived there and that live there today. And this has been changed drastically.

And so the way that the water levels are controlled, I think I showed a picture earlier on of the shores of Sipiwesk lake. You know, nobody is going to want to put a cabin or a cottage on those shorelines. They are too unpredictable and they are ugly and they are awful. And this is hundreds and hundreds and

hundreds of linear kilometres of shoreline that are affected in this way. This is extensive and severe. And I think this somehow has to be captured in a cumulative effects assessment.

So when we're looking at sustainable development, how do we reconcile the conclusions of yet another, assessment for another project into that context is something that people find very difficult to understand, basically. How do we, from a regulatory perspective, accept that there are no significant cumulative effects here?

Trying to look at how we can somehow balance the ecosystem needs and the needs of the people living downstream with the power generation. You know, it may be simply considered to be too inconsistent with power generation goals. But these goals are based on maximum power production to meet domestic demand, and foreign revenue, to maximize the revenue from these projects.

It's -- if we are truly concerned about environmental protection, we would be considering investigating flow regimes that maximize ecosystem health. And so with each new additional project, such as Keeyask, we would look

at that as an important parameter when we're doing the engineering design as well for the project. But I don't believe that this has been done in this case.

So if we're going to truly think about sustainable development, perhaps we should be looking for a balance that would meet society's needs for water and power while better protecting the long-term health of the river ecosystem as a whole, as well as taking a more serious look at the cultural impacts of these projects.

Optimization studies could include environmental goals throughout the river system, and the potential for adjusting reservoir levels to provide periodic spring flooding, for example, or to explore seasonal flow patterns in downstream affected reaches to consider flows that may improve shoreline vegetation structure, or aquatic ecosystem health -- it should be, that's cut off on that slide -- aquatic ecosystem health.

So, you know, looking at ecological values in the system as a whole would affect the economics of the Keeyask project. And so whether or not the project, as it's currently proposed, would affect the environment or the economics of

the rest of the system, I think we have to kind of look at it in more of an iterative fashion. And the fact that this is not part of the project proposal has implications for sustainable development.

The EIS talks about the hydropower sustainability assessment protocol. One of the -- there are, you know, there's lots of good material in there that makes a lot of sense in terms of what we should be looking at realistically. And I believe this project has received an international stamp of approval in terms of whether the project is sustainable or not. But just as one example, in that sustainability assessment protocol, they talk about freshwater fish that move within river systems such as up tributary streams to spawn. Depending on their location, dams can present barriers to these species for migration in both upstream and downstream directions, as well as creating direct physical barriers. Flow and water quality characteristics of the natural river regime may act as migratory cues. And hydroelectric schemes can also facilitate the passage of pest species into uninfested waterways through water transfers around the system.

So we have -- well, whether or not that's a situation in this system, I don't believe we know.

But the point here is that it's recognized that these systems are interconnected, and there's a certain amount, you know, looking at downstream and upstream passage of fish in the Keeyask reaches, but what about the whole river system? The sturgeon populations, for example, are healthiest in the lowest part of the river. Some of those sturgeon apparently move out into Hudson Bay and up the Hayes River. Lake sturgeon typically mostly stay in fresh water. They migrate into marine waters less so than most other species of sturgeon. But in this particular river system, it may be actually quite important for the sturgeon that they are able to get out into that estuary environment and also utilize another river system, adjacent river system. And to what extent that has helped the lower river populations to remain healthier is an important question as well.

The point here is that when we look at incremental effects of multiple dams and impoundments on aquatic environment, this can really be better understood if we look at, not

just the reaches of the river that are immediately affected by a new project, up and downstream and ideally the entire basin. In this case, the Nelson River is actually a sub basin of a larger basin too. It makes sense in that we know that the data are limited, but we should try to include the wider watershed.

Additional habitat mitigation in other reaches of the river should be seen to represent -- okay. So, yeah, the point here is that with large scale hydroelectric development on the Nelson River, we're looking at mitigation in those reaches, but we're not looking at mitigation -- except for a wider stocking program that could be done without the Keeyask project. We don't need to build the Keeyask project in order to increase stocking efforts. But without additional mitigation in other reaches of the river, I think it really should be seen to be more of a compromise from the perspective of ecological health, rather than a benefit as it seems to be portrayed.

And this is also only if the energy and the specific type of economic development are necessary. There are other alternatives

potentially.

It's described as a model of sustainable development, but I'm not so sure that we have, again, the evidence to suggest that if we're not looking at alternatives and we're not looking at the health of the river as a whole.

So the cumulative effects assessment of sequential hydroelectric development along rivers. In general, many environmental assessments of large projects in Canada are failing to adequately consider the incremental degradation of large river systems converted into step series of dams and impoundments. And a very legitimate question is, what proportion of a river system is acceptable to dedicate to hydroelectric production?

It appears that the Nelson River is being primarily dedicated to hydroelectric production, and the needs of the people who are living along the river, whose homeland territory has the Nelson River as the centre, are not being considered nearly as much as has been the case in other river systems.

If you look at Lake of the Woods, for example, since the early 1900s there's been the

International Joint Commission. They have tried to regulate Lake of the Woods with values, including cottage development along the shores of the lake, the fisheries, the collection of, harvesting of wild rice. There's many different values that need to be protected there, and hydroelectric development is just one of them. Whereas in the Nelson River that seems to be the primary objective that's being met. And then a certain amount of compensation has been done, which is not nearly equal to the level of effects that have occurred.

The question is, will the Keeyask project increase the economic incentive to manage the river primarily for hydroelectric production? I believe it certainly will. You know, if we change the operating regime to try to look at ecological and cultural values to a greater extent, we'll simply lose more money, because the reservoirs are operated for maximum revenue to the extent possible at the present time.

Another question is, will it further restrict the opportunities to manage flows for ecological and cultural values? Whether or not it has to do with the economic framework, converting

another stretch of the river to a reservoir will restrict opportunities in that area. It will be a reservoir environment rather than a riverine environment.

And I'd just like to make one last point about -- I only attended a couple of days of hearings a few weeks ago, and there was quite a lot of discussion earlier on about science and the Cree worldview. And a decision was made to take kind of two separate but parallel approaches to environmental assessment in this case, because there seemed to be some irreconcilable differences between Cree worldview and science.

And one of those differences may be that many people who live along that river have a hard time accepting this idea of looking at valued ecosystem components, for example, as opposed to looking at the whole ecosystem and trying to understand the whole ecosystem, because everybody knows that everything is interconnected. All biologists know that. All ecologists know that. Most people know that. And the purpose of using valued ecosystem components is simply a method, a framework that was developed partly by Gordon Beanlands, who is a professor at Dalhousie

University, years ago I studied with him, just to try to make environmental assessments when the regulatory environment was developing somewhat more feasible. We have to focus. We can't study everything. We don't have enough time. We don't have enough money. And so that's partly where that comes from. But that doesn't seem to make a whole lot of sense to a lot of people who live in, especially in close connection with a particular environment.

And so depending on how you're coming at it, at the questions, these differences of opinion, like they can occur from a variable experience, from observation, from scientific methodology and beliefs. They can also occur because of differences in values, and whether we're asking all the questions that are important to us.

And we talk a lot about using traditional ecological knowledge and being respectful and listening to the Aboriginal peoples to whom this land is so incredibly important. I don't live there. On a personal level, you know, unless there is some major positive effect from reductions in greenhouse gas emissions, it's not

going to affect me materially whether this dam is built or not. I don't have a personal investment in it. I don't work as an advocate for Pimicikamak. To the extent that I work with Pimicikamak, I'm attempting to help them bring some of their concerns into the debate about whether or not it's a good idea to build more dams on this river, and what do we do about the ones that we already have? So depending on how we are coming at these questions, we might ask the questions in a different way.

But some of this conflict that has been discussed about science and the Cree worldview seems to be more about a conflict between economic growth imperative and a traditional worldview that seeks to protect the land in as natural a state as possible.

But I think that -- and science, I think I talk about that in that written submission, that science is not a worldview. Science is a methodology which is designed to try to reduce subjectivity. It's designed to try to take a more objective approach to what we are investigating. And we have concepts such as reproducibility. In terms of the amount of

evidence we have, for example, for sturgeon habitat enhancement and successive stocking programs, this is what I'm thinking about when I look at that, is not that I'm trying to poke holes in this dam for the sake of poking holes in the dam, I don't personally -- if this is the best project, if we look at the project on the basis of all its merits, and if it makes sense for the people who are living in this region and on this river as a whole, if it provides benefits to people, if it provides -- especially benefits to the people who are living in the local area, because they are the ones that bear the brunt of most of the negative impacts. If that makes sense, then I would be fully supportive of this project, absolutely.

But I think that we don't need to separate what we learn through a scientific methodology and the Cree worldview maybe quite as much as has been done in this case. So there's some concepts in the ecological sciences such as landscape, ecology, that attempts to ask some of these broader questions that take a -- you know, Pimicikamak look at their whole traditional territory and how has this been affected. And

people have traditionally used the river all the way up to the mouth of the river, not just to the Keeyask area, and all the way up to the Churchill River. And in a boreal environment, if you want to live a hunting and fishing lifestyle, you need a lot of space. And that's the case with most boreal species need space, because of the harshness of the environment, and that's how they have evolved and adapted to that environment.

So concepts in landscape ecology that would look at riparian corridors, and that's actually only a very small piece of the picture, obviously, but it's only just one small ecological justification for looking at cumulative effects in the whole river as opposed to one section of the river.

I think that that would, an approach such as that would -- it requires quite a lot more thought and discussion, but it would bring maybe a little bit closer together science and the Cree worldview, perhaps, than the case where we -- where we're just deciding to more or less disagree and carry on in somewhat different paths with perhaps different conclusions. I think it might offer some additional common ground for people to

work together to try to understand the implications of building another dam on this river. And that's hopefully what we're trying to do here, not just to get through a regulatory process.

So, in general, my conclusions are that the geographical and temporal scope of cumulative effects assessment is too limited to be meaningful for several ecological questions. We need to identify some broader areas of focus for assessment. It doesn't have to be everything, but we could choose certain areas to focus on more. Consider the river corridor as an ecological and cultural landscape feature -- and a natural hydrological regime as a valued ecosystem component, because it is a primary ecological function and a primary driver of ecological change in the river basin.

And so if we look at incremental overlapping, and space and time effects on the natural horological regime, and we also look at opportunity cost for trying to bring that regime maybe back to something a little more conducive to the development of riparian habitats in certain parts of the river, again, whether that's possible

or not, I don't know because we haven't spent very much time on that.

And I am certainly aware that there are, you know, there's the coordinated aquatic monitoring program. I could talk about that some more. There has been study over the years that could feed into this kind of process. But there hasn't been anything near what we might want to look at in terms of a regional cumulative effects assessment.

So this broader perspective would meet I think a little better the spirit and intent of cumulative effects assessment of a river regulation project within the regulatory requirements, and it would also better address some of the questions raised by Pimicikamak.

The assessment of no significant effects on lake sturgeon based on proposed mitigation measures must be viewed as speculative. You might argue with that terminology. I think we could perhaps say that rather than concluding that our results are that these mitigation measures will reduce effects to the point where they aren't significant, I think should be perhaps looked at as a hypothesis as opposed to a result. It would

make more sense to do that. And when we're proposing a project to the public as a whole, I think it needs to be very clear that we're taking some risks here. It's not to say that there's not a promise in the proposals, or that they should not be implemented if the project is approved. It's simply that the known risks of further habitat loss for this endangered species are more certain. And the mitigation measures proposed face several challenges and may not succeed as planned.

And then in terms of promoting the project in relation to the climate change benefits of hydroelectricity, I think my opinion is that some of the effects of large scale hydroelectric development are similar in nature, in fact, more immediate and more severe on the riverine ecological cultural landscape than the regional effects of climate change. They are both important, but we can't necessarily trade one off for the other. The effects are more strongly borne, I mean much more strongly borne, almost all borne by the people who are living along the river, and the benefits are not equally shared.

And these factors must be taken into

consideration when assessing the environmental effects of a new hydroelectric project, compared to the alternatives in the context of climate change and sustainable development objectives.

And I understand, I know that the CEC is not tasked with looking at alternatives, but I think if we're looking at environmental kind of trade-offs, then it is relevant to these proceedings.

And the EIS should clearly acknowledge in its conclusions that there are adverse environmental and sociocultural effects that are directly associated with expanding the system in Northern Manitoba, that the geographical and temporal scope of these adverse effects is extensive, that the various components of the system are interdependent, physically, ecologically and financially, and that large scale hydroelectric development should not be described and marketed as simply clean and cheap. And I know that, you know, the descriptions have changed, but this is the way it comes across. It represents many significant compromises in exchange for economic activity, for centralized energy production, and reduced greenhouse gas

emissions relative only to fossil fuel generation and only if there's a direct displacement, and not necessarily relative to other forms of smaller scale decentralized production or energy conservation and efficiency. But obviously we won't get into that more, because there are a lot of differences there in terms of, you know, revenue to the province and so on.

But most importantly, the costs are not borne equally by different geographical and cultural groups. And this really, I believe, if the environmental assessment is meant to educate the public and decision makers and all of us to try to understand the choices that we're making, that these issues should be fairly clear, rather than trying to perhaps limit the seriousness of the effects to the region.

I'm working on the Site C project on the Peace River, and that project is called the Site C Clean Energy Project. It's not called the Site C dam and reservoir project, it is a clean energy project. So right there, there's kind of an effort to try to reduce the public's understanding of the fact that hydroelectricity does have severe ecological effects.

And the hotel room I was in yesterday, I went in there and there's, I don't know, about 15 things that are turned on in there and there wasn't even anybody in there. And so as a society, we are making choices to consider energy as cheap and clean. If we make those choices, I think each and every one of us have a responsibility to try to understand better what the implications of those choices are. That there are costs to this energy production that are I think higher than most of us recognize or wish to acknowledge.

So I believe that the Province should initiate an independent comprehensive regional cumulative effects assessment, that it should begin with a thorough review and interpretation of existing knowledge and data, and that we should develop research questions in close collaboration with affected Aboriginal peoples.

And this is one example here, I just got this air photo of -- this is Sipiwesk, part of Sipiwesk Lake, and this is an area called Duck Rapids, the rapids are in here. And we went out there in September with Pimicikamak fishermen who used to fish for sturgeon right around this area

below the rapids. And they talked about this area here, that there was a big beautiful marsh in here that they said used to be excellent hunting territory, lots of moose, lots of waterfowl. And this was a specific area where this family went on a regular basis, this is part of their trapline as well. And as of, I believe as of last year, this area is now gone essentially because of the high water levels. It has washed away completely. And so the character of these rapids is gone.

And it's actually quite a large area. I'm trying to think, it's about 600 metres across there I believe. And so we went by boat and we took a look around here. And it's, you know, it's a very significant change in this environment. That's only one example of one small area, but it's extremely significant to the people who have used this area for generations. It's huge. And it's a result of the very erratic water levels causing extreme erosion, and the increased flow that was a natural event into the whole system and caused flooding all over Southern Manitoba, and huge effects on a lot of people. But the fact that there's a 50 percent greater flow coming out of Lake Winnipeg than there was in the past

possibly has contributed to the more severe effects in this region. And again, if you relate that to, you know, the increased imperative to operate the whole system for hydroelectric development, and not think about these kinds of changes, I think that we need to consider that when we're looking at Keeyask, as well as how do we assess this whole system?

This last slide I put in here only to -- well, I guess I was going to talk about the effects of the glaciers here. But these are all major hydroelectric projects, and some of them are larger than others, but in Canada. And the hydroelectric projects have affected, you know, riverine environments in almost all of the major rivers in Southern Canada, and increasingly so in Northern Canada. And so this is an issue which is much broader too than just the Nelson River basin.

And I think I'll leave it there. I look forward to having some discussion with you, because I think that I kind of skimmed over some of the earlier points without enough explanation. But I look forward to some additional discussion, and thank you very much. Egosi.

THE CHAIRMAN: Thank you

Dr. Luttermann. Any further examination?

MS. KEARNS: No, I do not.

THE CHAIRMAN: Cross-examination, proponents? Ms. Rosenberg?

MS. ROSENBERG: Thank you Mr. Sargeant. I have a lot of stuff here, so I'll see if I can reorganize a little bit.

Good morning, Dr. Luttermann. I'll try to remember to call you Dr. Luttermann, although you and I are acquainted with each other.

DR. LUTTERMANN: That's okay.

MS. ROSENBERG: Go ahead.

DR. LUTTERMANN: Well, this is completely, as I mentioned before I can be very tangential, but I believe I understood that in some cases, people, maybe in these proceedings, were considered to be experts if they, you know, had certain professional criteria. I'm uncomfortable about that to some extent because the time I have spent, the limited time travelling on the Nelson River with some local hunters and fishermen, they know far more about that river system than I do. I'm looking at some broader concepts from what I have learned in other places primarily. And I think that it's extremely

important for these proceedings to recognize different forms of communication and understand the expertise that exists.

And I also felt that there's a certain amount of cynicism about what people's objectives are in the proceedings as well.

The level of extreme concern that I have heard from people, Pimicikamak, who live in the Cross Lake area, as well as in Fox Lake and Tataskweyak, Split Lake, about the environmental effects of these projects, regardless of whatever the economic benefits might be, is very high. And I believe that there's some level of cynicism among people about how much do people really care about the environment, and how much do they care about receiving benefits from the projects, and is that the primary concern?

I primarily work on the environmental impacts, and I believe that there's an absolutely passionate concern about what is happening with this river.

So, I'm sorry, if that's not at all what you wanted to talk about, but carry on.

MS. ROSENBERG: Well, that was a really long answer to, I think we were already

acquainted with each other.

I have to say now I think I may call you an aunt, if that's okay with the Commission. We have sat across the table from each other and I do feel impressed with that passion.

And if I may share just a little bit, I'm going to step right over the edge, and I have been told that I'm testifying and shouldn't be doing this in cross, but I do feel passion also from the people with whom I have had the privilege of working over the last while. And some of them are sitting at the table with me. You have sat at the table with my partner, Bob Adkins, and I think you have had the opportunity to meet the scientists who are sitting next to me.

And I see you are nodding your head. And I think you see they have a passionate commitment as well to some of the same principles you do.

Before we do any of what we think of as cross-examination, I want to pick up on something that you said at the very top of your presentation. And I'll try not to misquote you. But I think you said something like, it would make sense if people would treat environmental impact

assessment as not adversarial, or as less adversarial, and that we work toward a process where people can simply communicate with each other in a more forthright way and see if they don't agree on more things.

You are nodding your head, I am nodding my head. So, Mr. Chairman, Annette and I are in agreement on those principles, to the extent that it matters.

And as well now, you have spoken about a wide range of things, and I'm not going to talk to you about all of them, I'm going to pick just a few of the things you talked about this morning.

But I also was mindful of other ways of doing this process. I had the opportunity to look at the testimony you gave in the Nalcor hearing a couple of years ago, and tried to learn what I could from that. And one of the first things I learned was that in that particular hearing, if I'm not mistaken, the proponent actually called back some of the experts into the room to engage with you and talk with you about some of the points you made. And that struck me as a useful process. And before we start talking about Keeyask, I wondered if you could reflect a

little on that?

DR. LUTTERMANN: So that was more than a couple of years ago. But reflect? I'm not sure what your question is exactly?

MS. ROSENBERG: My question was, did you find that useful, rather than engaging with a lawyer, to engage --

DR. LUTTERMANN: Oh, absolutely, yeah. Again, I have the utmost respect for the people who have been working on the terrestrial and aquatic studies related to Keeyask. I cannot pretend to know and understand all of the details of those studies. I absolutely feel confident that I am capable of interpreting the results of the studies and how they relate to conclusions. But we always have more to learn, absolutely. But I think that there are some -- this process in terms of coming to decisions has to have some sort of an end, I guess, right? So we can't talk about it ad infinitum. But I think we need to get to the core of some of the most serious issues here.

I don't imagine that very many of the scientists who have worked on this project would say that we know for sure what the results of these mitigation measures are going to be. And I

believe that that has actually been quite clearly expressed in the body of the environmental assessment, as well as in the technical reports, as well as in presentations. I don't believe there have been very many things said, if any, that I would disagree with. It's in the conclusions that I find some difficulty.

So, certainly, we could discuss it more and I'd welcome any discussion on any of the points.

MS. ROSENBERG: All right. Well, that being said then, I'm going to try to talk to you a little bit about some of the issues in the terrestrial assessment. It's where you started and I think that's where I'd like to start too.

Before I do that, I just had prepared a small package of materials, and I don't know how many of them we're going to talk about, but I'd just ask that they be passed out before I begin to ask you any questions.

So I have made enough copies for the Commission and counsel for Pimicikamak and counsel for the Commission, and I think that's it.

All right. Dr. Luttermann, you made a number of points about the importance of riparian

habitat, correct? That was pretty important to you?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: And you made a number of points about what you felt to be things that we need to understand about particularly the shoreline zones along the Nelson River, correct?

DR. LUTTERMANN: Yes, yes.

MS. ROSENBERG: And your overall point was, I think if I understood it, was that the shoreline of the river as a whole is of interest to you?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: I think at some point in your presentation you acknowledge that, as the river flows north, and maybe indeed as the river flows in any direction over a very, very long geographic distance, that those shoreline zones can change considerably, that there can be many different types of shoreline zones along the length of the great river. Is that agreed?

DR. LUTTERMANN: Well, one of the characteristics of river shorelines, especially compared to lakes, is that these riparian habitats are actually quite complex, and they are described

as mosaics of habitats. And so you don't have, it's not a continuous band of similar habitat. And I didn't try to get into a description of that. I believe there's some discussion of that in the EIS as well. And so that's part of what makes these habitats so rich, is that, you know one area has gravels because that material is being deposited there because of the way of the flow of the water. Another area is muddy and silty and is a protected bay, and so it has different habitat characteristics. And it's this mosaic of habitats which partly defines the richness of the riparian corridor.

MS. ROSENBERG: And the goal then I think you said is to maintain regional biodiversity.

DR. LUTTERMANN: Yes. Well, it depends how you define the region as well. I think the local biodiversity is extremely important as well, yeah.

MS. ROSENBERG: All right. So we are agreed that habitats can change as you move down the river, and we're agreed on the goal of maintaining regional biodiversity, however one defines the region. Those are things we have in

common then, I think we have established, yes?

MS. KEARNS: Dr. Luttermann, I just remind you for the transcript, you have to say yes or no. Nodding heads doesn't translate.

DR. LUTTERMANN: Yes.

MS. ROSENBERG: For this little interaction, you'll know that Ms. Kearns is a real litigator and I'm just an environmental lawyer standing in here.

DR. LUTTERMANN: And I'm not a lawyer at all.

MS. ROSENBERG: So she knows to remind you to not nod your head.

All right. I think we were talking about establishing some of the specifics of what happens on that riparian zone. And you'll be happy to know that in addition to looking at your testimony in the Nalcor hearing, I also had occasion to read some of the material that was filed in the Site C panel, joint panel review application.

DR. LUTTERMANN: Yes.

MS. ROSENBERG: You have indicated that you have been providing advice to the Treaty 8 Tribal Association. Have I given their name

correctly? Probably not.

DR. LUTTERMANN: That's right.

MS. ROSENBERG: Tribal Association?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: And so I had to look at the material that you wrote, and I was trying to see whether it was also important to you that specific wetland types be characterized and understood thoroughly as a means of figuring out the importance of the riparian habitat. And I'm just going to read to you, you can tell me if I'm right or not, but I think I'm reading it correctly. One of the comments you made was that rather than presenting figures which lump wetlands together, it's more relevant, even in a summary, to explain the relative loss of the specific types of wetlands?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: And I did find that on page 14 of your report that was filed in the Site C material.

So we're talking about the relative loss of specific types of wetlands. Because I think you'll agree with me that wetlands can be more and less valuable in terms of ecological

function, they can be more and less rich, and that it's very, very important to understand the specific nature of the functions that each wetland type has in the regional setting?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: Now, I wonder if you had a chance to look at some of the material that was presented actually by Dr. Ehnes in this hearing, where he summarized bit of the 10 years of research and data analysis and writing that went into the EIS. Did you have a chance to look at that?

DR. LUTTERMANN: Well, I was not here for his presentation, but I have read, I believe, most of what was filed for the EIS and the supporting documents.

MS. ROSENBERG: Great. And so what I have given to you in the package and what I have given to the Commission is just an excerpt of the pages from his presentation that set out the VECs that represent the issues, I think, that have been concerning you about the shoreline and the habitat along the river.

Do you want to take just a second to glance at that?

DR. LUTTERMANN: Well, I do believe I did get a copy of the presentation, so I have looked at that.

MS. ROSENBERG: Thank you. I couldn't remember, you were sitting behind me but I couldn't remember which days you were here and which you weren't. So I thought that might be helpful.

You'll recall then that Dr. Ehnes reviewed with the Commission that the terrestrial assessment included VECs, and we don't ever need to define VECs again here I don't think, dealing with ecosystem diversity, agreed, and wetland function?

DR. LUTTERMANN: Yes, yeah.

MS. ROSENBERG: And that he presented a number of slides explaining why those particular VECs took into account the quality of the riparian habitat, and they took into account both the wetlands along the main stem of the river and in the off-system areas in the regional study area. Do you recall that?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: And in the course of that he certainly identified some of the studies

that have been done in support of that assessment, and included in that was riparian habitats on the main stem?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: And that included a detailed characterization of all of those habitats?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: And also detailed characterization of the very varied and rich wetlands in the off-system areas that are included in the regional study zone, correct?

DR. LUTTERMANN: Yes, yeah.

MS. ROSENBERG: Now, you have indicated in your presentation today, I'm looking at slide 18 if the Commission wants to go back to it with me, that riparian wetland, you have referred to riparian wetlands and riparian habitats along the main stems of large rivers. And just so we're clear on that -- I am sorry, I'll give you time. I think what you're talking about is what I have come to understand from reviewing some of the material in the terrestrial volume is the shore zone area. Is that what we're talking about, the area on land and in the water

in the area along the shore zone?

DR. LUTTERMANN: Well, essentially, and this is described in the EIS, the areas that are influenced by the flow of the water, the adjacent water body, yeah. And they can be influenced differently on a seasonal basis as well as from year to year, yeah.

MS. ROSENBERG: And in high water years as compared with low water years?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: And depending upon the terrain, the geography, I don't know what the word is I am looking for?

DR. LUTTERMANN: The morphology, so, yeah, the slope -- if you have a flat area and you have a steep area, it's going to flood more overland onto the flat area than it is in the steep area. And if it's bedrock controlled, then it's not going to erode, there will be different patterns of deposition. So all of these factors have an influence on what kind of plants can end up growing there and how those shorelines can be used by other species as well. And they can have an effect -- I think I mentioned earlier, if you look at a flood plain, there may be in certain

environments, you might have very high flood only once every 20 years, or once every 50 years. But even that one event can have a fairly large influence on the soil characteristics, and soil characteristics have a huge influence on forest growth. And so you can have flood plain forests that are only actually flooded, large mature trees that are actually flooded every once in a while. And so it's an important concept to think about in terms of the long-term development and maintenance of the diversity of that habitat, that this long-term influences of the adjacent water.

MS. ROSENBERG: I think you'll agree with me, and I think you have just reflected back, that along the length of a river, though, there can be very real differences in terrain and soil types, and the height of land between the water and the adjacent terrestrial terrain.

DR. LUTTERMANN: Absolutely.

MS. ROSENBERG: And all of those are important in understanding the particular shore zone and habitat types. Agreed?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: And you have also had occasion to -- I don't know whether you submitted,

you constructed the IRs that were submitted on behalf of Pimicikamak but...

DR. LUTTERMANN: Probably most of them, yes.

MS. ROSENBERG: Okay. You submitted some information requests. I'm looking particularly at CEC round one PCN two, which is in the package I gave you.

DR. LUTTERMANN: In the package -- here it is. Yes.

MS. ROSENBERG: And in that IR, I think you got basically a comprehensive list of all the places in the filed materials where you could find information about the habitat analysis, the habitat types, vegetation, the various criteria that went into determining information about the shore zone habitat that was of interest to you. Agreed?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: And one of the places that that IR directed you to, or the answer to the IR directed you to was a table in the EIS, and I think that should also be in your package. If you can have a look at table 2-44? Do you see that?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: Thank you. Just for the record, that's on page 2-177 of the terrestrial environment supporting volume, section two.

DR. LUTTERMANN: Yes.

MS. ROSENBERG: Now, I have had explained to me, and I'm sure you understand this far better than I do, but I have had explained to me that there are many, many variables that have to be taken into account in understanding deeply, and studying, mapping, analysing, and using information about those shore zones. And that in analysing that the terrestrial team took into account about 15 attributes of shore zones, and they came up with about 70 different types of wetlands. And those are very, very specifically determined by the characteristics such as you and I have been talking about, and things I'm sure that I would understand nothing about. Agreed?

DR. LUTTERMANN: Yes, um-hum.

MS. ROSENBERG: And that for the completion of this EIS, all of the area in the regional study zone -- I think at this point I have to stop and remind the Commission that we have talked about some nested areas of studies.

We're talking about study zone five, and the Commission and you might remember if you were here that there is a difference in terrain between study zone five and study zone six, and people might be able to call that picture to mind, that would be one of the areas where the terrain changes dramatically.

So we're talking about study zone five. And that the study that was done in order to explain wetland types and the importance of wetland types involved not theoretical information, but actual mapping and field studies that allowed people to very deliberately and specifically characterize those wetland types. And Dr. Luttermann, you're familiar with that information; agreed?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: Because you looked at the EIS, and as well you looked at some of the technical reports that were shared with you in the course of the article nine discussions?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: All right. Well, let's look at table 2-44 and see what we can learn, see what maybe someone of your ability can

teach someone like me about the relative ranking of the marshes and other wetland types that are listed on the table. I'm looking at the wetland system, the system of classification on the left-hand side, which tells me the specific type. And then on the very right-hand side in the last column, I'm looking at the wetland quality score. I'm wondering if you understand or could tell me how that score, how you understand that score to be derived?

DR. LUTTERMANN: It's derived from assigning a score to the surveyed sampled wetlands, and in terms of the whole list of parameters that they looked at, tried to get a sense of the quality of the wetland in terms of how diverse it is and what is its habitat utility. I can't remember that whole list of parameters, but I think it's a useful way to look at this.

MS. ROSENBERG: Is it fair to say that it's based on ecosystem functions, it's based on the function of those wetlands in relation to the broad ecosystem?

DR. LUTTERMANN: It certainly is for many of the functions, yes.

MS. ROSENBERG: And since the goal of

the framework of this assessment was the maintenance of ecosystem diversity, that that would be something that would be really important to study then in that ranking?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: Great. And so it's clear then that for the purpose of this assessment, the quality of the work that was done supports that very specific characterization and understanding of the importance of the wetland types at a deep level. Agreed?

DR. LUTTERMANN: Yeah, I think it's actually quite good, especially compared to some other assessments I have seen.

MS. ROSENBERG: Fair enough.

And so you have in your slides, and in fairness, certainly in your slide, slide 18, you weren't talking about specifically the Nelson River, or the Lower Nelson River, or the reach of the river affected by the Keeyask project, you were talking in general from your review of literature and your familiarity with habitats across the country, about what's generally true about the riparian wetlands on the main stem of a river?

DR. LUTTERMANN: Yes, that's right.

MS. ROSENBERG: And in the case of this river then, can you agree with me then upon review of the table that, in fact, the marshes -- maybe we should look at one more table in fairness, I put it in the package but I didn't call your attention to it. If you look at table 2-43, I think in that table you see off-system marsh compared to Nelson River marsh?

DR. LUTTERMANN: Um-hum.

MS. ROSENBERG: I think I heard you say in your presentation that the marshes were the richest type of habitat. I don't know if you said it in the presentation or in the report.

DR. LUTTERMANN: Yeah, in general they are. In the Lower Nelson River, which I think is recognized, well, in the entire Nelson River it has been affected by flow regulation, and currently the marshes that do exist in the Keeyask reaches are degraded from what they probably were in the past.

MS. ROSENBERG: And in fact, you asked for some information about what had happened in the past. Agreed?

DR. LUTTERMANN: Yeah.

MS. ROSENBERG: I think you referred to it in the course of your presentation.

What was your understanding of the process that was applied to understand the habitat in the past?

DR. LUTTERMANN: Well, there was an analysis done of historical air photo imagery that looked at the Keeyask reach, as well as partly up into the Kelsey reservoir and down into the Limestone and Long Spruce reservoirs. And so there's a certain amount of information that we can understand from historical air photos. It depends on the resolution of the air photos. We can certainly understand something about vegetation cover. So if you have any area of land, does it have forest on it? Does it have shrubs on it? Does it have sedges? You can't identify down to species unless there's certain characteristics that you are familiar with through field surveys to extrapolate from the air photos to the field survey.

So in this case the analysis was done, and they certainly looked at vegetation cover, and the imagery was not consistent from one reach to the next. And so the level of analysis can also

not be consistent from one reach to the next.

MS. ROSENBERG: Is it fair to say then that the historical mapping was done to the extent that the existing air photo imagery allowed?

DR. LUTTERMANN: For those reaches, yes.

MS. ROSENBERG: For those reaches, agreed?

DR. LUTTERMANN: Agreed.

MS. ROSENBERG: And in fact, Dr. Ehnes' conclusion was that mapping was completed to the extent needed to assess the project and cumulative effects for the Nelson River wetlands in that region?

DR. LUTTERMANN: That was the conclusion, yes.

MS. ROSENBERG: And factually, just in terms of the specifics, the factual conclusion was that in this particular reach of the river, the relative importance, or the relative quantity of vegetated area was small. And you noted that in your report?

DR. LUTTERMANN: Yes. The relative quantity was small of well vegetated areas. I believe -- was it in that study where it was

talked about any widths that were less than 10 metres, I believe it was, were not mapped because they were too small to map? Yeah. But in terms of the area -- is that correct I believe? I'm not supposed to be asking you questions.

MS. ROSENBERG: I can't answer them though.

DR. LUTTERMANN: I believe it was less than 10 metres. So whether or not a strip of vegetation that was less than 10 metres wide is important to a species and to biological diversity, you know, is a question I think that we could ask as well. So the mapping can accomplish mapping of larger areas of well-vegetated areas.

The fact that they are relatively small -- well, we've got this image up on here for the Lower Churchill and Labrador. If you look at that river, which is also a river affected by -- well, it's actually different because you have the water coming from an upland plateau, which is higher altitude has a shorter, you know, a later spring breakup. And so this lower part of the river is not, under natural conditions, it wouldn't be affected as much by ice scour, for example, because you haven't got that push from

the upriver. So down, it starts melting off down near the mouth, and so the shorelines, the shorelines, the shore ice stays more fast as it's melting, and so you don't get as much ice scour. But this particular area here is affected by very large generating stations upstream, and there's extreme ice scour on the lower part of the river, which very definitely has affected the downstream habitats quite a bit. But nevertheless, there are still areas that -- this is in an area which has a point bar, we're looking downstream, and so it's a little bit sheltered. And then there's a tributary coming in so there is, you know, it still gets the influence of a spring flood in this area, and it's not scoured by ice.

So the fact that, you know, the Lower Churchill River doesn't all look like this, but these areas, even if they are small relative to the length of the shoreline in general, are important for maintaining regional biodiversity. Because they are rare too.

And then if you have certain less common plants growing in an area like this, and the propagules, so pieces of the plant, depending on how the plant reproduces itself, the seeds can

move down the river, they are more likely to move down the river. So in this river you see a pattern where there are certain less common species that are pretty much all distributed along the main stem of the river, because it's the most effective dispersal mechanism for certain species. So that's getting a bit off track, but the point about whether or not --

MS. ROSENBERG: It was quite a bit off track. If I can just bring it back to Keeyask.

DR. LUTTERMANN: But small doesn't mean insignificant.

MS. ROSENBERG: So now we're coming down to two specific questions which I did want to come back to. Firstly, the historical condition to the extent it was possible from air photos was indeed mapped. Agreed? You received that information --

DR. LUTTERMANN: In those reaches, absolutely, yes.

MS. ROSENBERG: In those reaches, certainly.

The second point, though, is what's there today? What is left today? And I was directing your attention to table 2-43, which

compares the relative value of the off-system marsh and the Nelson River marsh in the area that's under discussion, the regional study area. Do you see that?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: Can you see which of those two, off-system and Nelson River marsh areas is richer?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: And which would it be?

DR. LUTTERMANN: It would be the off-system marsh.

MS. ROSENBERG: Sure. And I think you have already agreed with me that the area that we have identified as the regional study area is -- it was studied in detail and specifically characterized in terms of the specific wetland types present in it, that those wetland types were valued, and that you agreed that that's the way this type of work has to be done. Agreed?

DR. LUTTERMANN: Yes.

MS. ROSENBERG: And when you look at table 2-44, what do you learn from the relative value of the scores displayed on that table? What's the most important type of marsh, or the

most -- I don't know what the word is I am looking for -- the highest quality type of marsh on the table?

DR. LUTTERMANN: Well, you have four that are in riparian and lacustrine environments, and in streams and bays, yeah.

MS. ROSENBERG: None of them are along the main stem. Agreed?

DR. LUTTERMANN: Agreed.

MS. ROSENBERG: Where are the habitats that are along the main stem on this table?

DR. LUTTERMANN: At the bottom.

MS. ROSENBERG: At the very bottom.

DR. LUTTERMANN: Yes.

MS. ROSENBERG: So the generalization, which is certainly a good principle to start from in scoping and understanding how to think about the effects, may not be true in the specifics of any one assessment. Agreed?

DR. LUTTERMANN: I'm sorry, can you repeat that question?

MS. ROSENBERG: The general principle such as is stated on your slide, slide 18, where, for example, you say that riparian wetlands typically form approximately 1 percent of any

region, but are generally some of the most productive, that is the richest habitats?

DR. LUTTERMANN: To clarify, what I meant in that statement was in a naturally functioning system.

MS. ROSENBERG: Fair enough.

DR. LUTTERMANN: And the Nelson River is not a naturally functioning system.

MS. ROSENBERG: Fair enough.

DR. LUTTERMANN: Not any part of it is.

MS. ROSENBERG: All right.

Mr. Sargeant, this may be a good place to stop for lunch.

THE CHAIRMAN: Absolutely, I was just about to say that. So thank you for doing my job for me. We'll break until 1:30.

MS. ROSENBERG: Thank you.

THE CHAIRMAN: Oh, Mr. Williams.

MR. WILLIAMS: I'm sure you have missed me, sir.

THE CHAIRMAN: As always.

MR. WILLIAMS: Just, the Partnership had some supporting material for cross-examination which appears to be drawn from a variety of

sources, the IR responses, and tables from the EIS guidelines, et cetera. We don't have that. Now we have tried to follow along through our electronic document but it's been difficult. I don't fear that we have missed any juicy parts to date. On the off chance that there might be something juicy to come up, if the Partnership would certainly make some available to the participants, that would be appreciated.

THE CHAIRMAN: I would agree. And I would ask the Partnership, if they could get additional copies of these available over lunch time, and that for future tabling of documents you at least have another half a dozen or so for the participants.

MS. ROSENBERG: Forgive me. Point taken.

(Proceedings recessed at 12:31 p.m. and reconvened at 1:30 p.m.)

THE CHAIRMAN: Okay. We will reconvene, please.

MS ROSENBERG: Mr. Sargeant, I just passed out a lot of material, and I don't know how much time we are going to use, but to keep the time frame realistic or as short as possible, I

passed it all out now, and what we use, we use, and what we don't, we don't.

THE CHAIRMAN: I was just lamenting the poor trees. But carry on.

MS ROSENBERG: I guess I have to apologize to the trees before I start.

All right. Are you ready Dr. Luttermann?

DR. LUTTERMANN: Yes.

MS ROSENBERG: All right. I just want to start with the frogs, and just to clarify, the first little package you got was the bit on leopard frogs. Do you see that?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And just I wanted to thank you for acknowledging the points that were made by Dr. Ehnes and Ms. Wyenberg in cross, I think, which I think you acknowledge established the fact that those frogs were distributed on the map, which I think you will see in the package, doesn't mean it was a riparian corridor for the transportation of frogs?

MS. KEARNS: Ms. Rosenberg, I don't have a copy of what was just -- I only got one piece of what was handed out. Are there more

copies for me?

MS ROSENBERG: We will stop right now.

THE CHAIRMAN: I had requested before the break that we make enough available for the participants as well. Did they get copies of these new documents?

MS ROSENBERG: They are right here. We are just passing them out.

Sorry, just to be clear, I passed out a package on frogs and a package on sturgeon. And does everyone in the Commission, and counsel for Pimicikamak and counsel for the Commission have those two documents? Certainly the witness does.

THE CHAIRMAN: We have got those two, and then we have this other one that seems to be about eight or ten things clipped together.

Now our counsel doesn't have it any more because he graciously gave it up.

MS ROSENBERG: Forgive me, I didn't instruct Vanna properly. It is not Vanna's fault, I didn't provide Vanna good instructions.

THE CHAIRMAN: I think you have too many Vannas today.

MS ROSENBERG: Or too many pieces of paper.

THE CHAIRMAN: That's probably the most accurate, yes.

Okay, Ms. Rosenberg, please carry on.

MS ROSENBERG: Thank you, Mr. Sargeant.

All right. So, Dr. Luttermann, in the package are the maps of Manitoba with the frog distributions that I think you refer to in your presentation.

DR. LUTTERMANN: Yes, and thank you for getting that, I couldn't locate it when I was going to put it in there. So thank you.

MS ROSENBERG: And also thank you for acknowledging that that distribution does not mean that there was distribution along a riparian corridor, but simply that's where the sightings were of frogs. That's what those maps indicate?

DR. LUTTERMANN: That's what I interpret from looking at the maps, yes. There is only limited information you can interpret from these maps.

MS ROSENBERG: Thank you. And that was, in fact, Dr. Ehnes' testimony in the hearings.

DR. LUTTERMANN: Good, we agree.

MS ROSENBERG: Just to make a point about whether there are or aren't leopard frogs, just so we are not in doubt, you also have in the package a quote from section 5.2.3.1 of the terrestrial environment supporting volume.

Are you able to see that in the package? It is page 5-2? It should be a single page in your package.

DR. LUTTERMANN: Okay, yes.

MS ROSENBERG: And that is indicating that the elders and, of course, this would be the Keeyask Cree Nation elders, indicate that northern leopard frogs were once abundant, but disappeared from the area in the late 1970s. And that, of course, also accords with what you reflected back about a worldwide decline in frog population?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And just for completeness, I've attached the management plan for the northern leopard frog, if that's the document you were referring to?

DR. LUTTERMANN: Yes.

MS ROSENBERG: All right. And so you don't mind at all if that comes in as evidence then? That's what you referred to in your

presentation?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And one last point on the frogs, I don't know if you were here the day that Ms. Wyenberg gave her opinion on the potential use of a fast-flowing river for the distribution of frogs. Were you able to hear that testimony?

DR. LUTTERMANN: No.

MS ROSENBERG: I think what she said, if I'm paraphrasing it correctly, is that is not a preferred method of distribution of frogs, and that what they would use is the habitat that is of similar nature but not fast flowing which is abundant in the region?

DR. LUTTERMANN: Well, I didn't hear her exact description of that. But, no, frogs, what I'm talking about in terms of use of the riparian corridor is not that the frogs are going to jump in the water and swim down the river. In a river, when we look at the riparian -- the riparian habitat is the habitat that is created by the periodic flooding of the river as a whole. So in any major river, you will tend to have lots of backwater channels, you will have little ponds,

depressions in the areas that might be flooded even, you know, seasonally, that are created off the main stem of the river. There are tributaries, flood up the tributaries a certain amount in the spring and so on. So there is all kinds of habitat that's created which is not in the highest velocity parts of the river. It depends on the characteristic of the river. And the Lower Nelson River is, you know, more channelized in parts than it is in the upper part too.

MS ROSENBERG: So, if you were to hear that the opinion of the biologist is that that would not be the preferred means of distribution and, in fact, there would be abundant habitat that would permit distribution should the frog recover, that habitat is not a limiting factor. You don't have a basis to disagree with that, do you?

DR. LUTTERMANN: Without doing thorough analysis of the habitat in the region in general, but I would suggest that we can't discount the major river riparian habitats under natural conditions as being one way of effective dispersal. If you have a number of, you know, good marsh conditions along the way that are not

too far apart, and they don't have to be on the very main stem of the river, but if they are in back water channels and so on that are influenced, then I think that the riparian corridor concept is a useful one to look at in this case.

And I don't believe there has been any study that would suggest that overland dispersal away from the Nelson River necessarily has been, you know, is more effective, and especially if we are looking at the cumulative effects of large scale forestry operations, in addition to degradation of riparian habitats overland. And these frogs are not likely to cross over large bogs, for example. It is not bog habitats that they prefer, that they can use effectively.

MS ROSENBERG: Still, if it were the opinion of the biologist who did the assessment that there is plenty of the three types of habitat that is needed in those overland areas, you wouldn't have a basis to disagree with that, would you?

DR. LUTTERMANN: No.

MS ROSENBERG: All right. Let's move on to sturgeon.

Now, we've had some discussion, and I

think quite valid discussion about the certainty of predictions and the usefulness of the various sturgeon management programs and strategies that have been undertaken in Manitoba, and specifically for this project.

I would like you to look with me for a moment at the first item in your package, which is the Manitoba Lake Sturgeon Management Strategy. I don't know if it is in the package or if it is separate.

DR. LUTTERMANN: Yes, I have it.

MS ROSENBERG: And I believe, Dr. Luttermann, that you actually did refer to that document yourself --

DR. LUTTERMANN: Yes.

MS ROSENBERG: -- in the presentation. So you are familiar with that, agreed?

DR. LUTTERMANN: Yes.

MS ROSENBERG: Are you aware that this 2012 report is an updated report on a strategy that was commenced in 1992?

DR. LUTTERMANN: Yes.

MS ROSENBERG: Effectively, there has been 20 years of experience with Manitoba undertaking a lake sturgeon management strategy?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And you will agree with me then that this report deals in detail with the sturgeon populations, the habitats, the past and existing stressors, including hydro development and other sorts of stressors such as overfishing, throughout all of Manitoba's water bodies where sturgeon might be found?

DR. LUTTERMANN: Yes, it summarizes the work that's been done on that.

MS ROSENBERG: That's a fair point, it is just a summary of the work.

DR. LUTTERMANN: Yes.

MS ROSENBERG: If you look at page one of the executive summary and the bottom paragraph? I wonder if you could just read that bottom paragraph for me?

DR. LUTTERMANN: "The experience of managing lake sturgeon in Manitoba has shown that limited mortality is the single most effective means of sustaining lake surgeon stocks. The failure to do this effectively during the latter part of the 1800s and the early part of the 1900s in the

historical commercial fishery lead to dramatic declines that left lake sturgeon stocks throughout most of the Province in the state they are today. Protecting habitat is also important, but lake sturgeon in several parts of the Province have demonstrated that they can adapt to fairly severe habitat alterations while proving unable to adapt to excessive levels of harvest."

MS ROSENBERG: Thank you.

And just looking at the last paragraph in the executive summary, and I think it is my turn to read. I will just read for you the second sentence.

"The reaches that were the focus of the 1997 strategy on the Winnipeg, Saskatchewan and Nelson Rivers, all of which were described as depleted or declining, are now showing signs of improvement. Stocking in the Assiniboine River provides evidence that this tool can be effective for re-introducing lake sturgeon

populations in areas where they have been extirpated."

You will agree that that's a summary of the Manitoba experience?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And the Commission will be relieved to hear that we are not going to go into detail on the various strategies that are part of Manitoba's program.

Next, just to put the world situation of sturgeon in context, because you did make a point about that in your paper, although I don't see it repeated in your presentation. You commented on the vulnerability of the sturgeon, lake sturgeon population. Agreed?

DR. LUTTERMANN: Yes.

MS ROSENBERG: All right.

I just wondered if you had had a chance to look at the report of the IUCN in -- the updated report in I believe 2012, which is attached to the material that I just provided to you. And I think -- are you familiar with that method of listing, and who the IUCN is?

DR. LUTTERMANN: Yes, I just looked at it the other night, in fact.

MS ROSENBERG: Great. Perhaps you could help the Commission understand what this listing means?

MS. KEARNS: Can you say again what document you referring to?

MS ROSENBERG: My apologies.

DR. LUTTERMANN: It is the red list, IUCN red list of threaten species.

MS ROSENBERG: Thank you.

Just so we are clear, it is just a page from the website, it is a single page from the website and it is really just the index. And I'm sure if I would let Dr. Luttermann explain, she would tell you there is a great deal of information behind that, but I have only given you the index page.

So IUCN, am I correct in saying it is the International Union on Conservation and Nature. Thank you.

Can you explain to me what the context is here and what they are saying about lake sturgeon?

DR. LUTTERMANN: This was, it says it was published in 2004. Is this the latest update, 2004?

MS ROSENBERG: We got this from the website about a week ago.

DR. LUTTERMANN: So, 2004, yes, essentially that they had done a reassessment and they, as you have highlighted here, more detailed look at the data availability for the species has resulted in it being downgraded to least concern. So this is looking at the entire range of the species as well, not just one particular area, but the range of lake sturgeon as such.

MS ROSENBERG: This is sort of the world context for lake sturgeon?

DR. LUTTERMANN: Yeah, but they don't live everywhere in the world.

MS ROSENBERG: No.

DR. LUTTERMANN: Just in fairness.

MS ROSENBERG: Can you just take look at the scale at the top of the it? I see sort of, I'm thinking of it sort of as a number line or sliding scale at the top. Can you tell me what those classifications mean?

DR. LUTTERMANN: Well, you want the detail of every one of these classifications?

MS ROSENBERG: No, I'm just looking at it to see if I understand the scale correctly. My

reading of it was least concern is, well, obviously we are much less concerned about the sturgeon, at the far end we are very, very concerned about the sturgeon?

DR. LUTTERMANN: Yes, I believe the criteria that are used are not exactly the same as, for example, listing under your Provincial or Federal Canadian legislation in terms of listing species. But, yeah, certainly it is a sliding scale, least concerned. As a species within its range, the IUCN does not feel that it is either threatened or vulnerable or endangered, or critically endangered and so on.

MS ROSENBERG: And that would be because stocks are increasing?

DR. LUTTERMANN: Yes, that's what it -- yeah.

MS ROSENBERG: I have to tell you that I didn't know anything about the IUCN, I went to the website because of the comment in your report. So thank you for that, I'm glad to learn about it.

Okay. Another issue I wanted to talk about was concern over whether we know enough about habitat conditions in other reaches of the Nelson. And you specifically highlighted I think

the Upper Nelson which would be of most concern to your client?

DR. LUTTERMANN: Pimicikamak are concerned about the entire Nelson River.

MS ROSENBERG: You did speak about the Upper Nelson, am I correct?

DR. LUTTERMANN: Yes.

MS ROSENBERG: I'm going to ask at this moment for a map to be displayed. I think it is in the package anyway, but if we could put it up on the -- who has the disk?

It is the coordinating aquatic monitoring program map.

While they are considering how to put the map up, Dr. Luttermann, you did refer to the CAMP program also, I know you took some note of it. So I wonder if you could take a look at it and tell me whether you have an understanding of what the coloured areas on the map mean?

We do have it up.

Were you familiar enough with the CAMP program to understand what the various colours on this map indicate?

DR. LUTTERMANN: Yes, they are all the water bodies that are being included in the

monitoring program that is being coordinated by Manitoba Hydro and Manitoba Conservation and Water Stewardship.

MS ROSENBERG: And the colours indicate the sectors or zones in which that data is being collected. Agreed?

DR. LUTTERMANN: Yes.

MS ROSENBERG: So you see -- I don't know if it is purple on your version, I think it is purple on the screen -- you see the Upper Nelson area, agreed?

DR. LUTTERMANN: Yes.

MS ROSENBERG: All right.

Now, you did, or at least Pimicikamak did put some questions in the course of the IR process for this hearing about habitat in the Upper Nelson?

DR. LUTTERMANN: Yes.

MS ROSENBERG: Do you recall that? And I have attached in your package CEC round one PCN-0008?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And that response referred to the Manitoba Lake Sturgeon Management Strategy which we've already just put into

evidence. Agreed?

DR. LUTTERMANN: Yes.

MS ROSENBERG: I drew your attention to that.

And it told you that that strategy provides a general description of key habitat alterations in the Upper Nelson, from the outlet of Lake Winnipeg to the Kelsey Generating Station. You had a chance to look at that?

DR. LUTTERMANN: Yes.

MS ROSENBERG: I think if we would get some help with the pointer, we could just point the Commission's attention to that area. Do we have a pointer?

You have got it, Annette. Thank you. That's excellent.

DR. LUTTERMANN: There is Kelsey and there is the Upper Nelson and Jenpeg in here.

MS ROSENBERG: Great.

You know what, if you give the pointer to Dr. Schneider-Vieira -- oh, you have a pointer, there you go. That's very difficult. Do you want to switch pointers?

Sorry, if I keep at this long enough I will get the mechanics to work better.

All right. As well you referred to the aquatic environment supporting volume, and I would just refer you to page 6-8, which is also in your package. And I'm looking at the fourth full paragraph on that page --

DR. LUTTERMANN: Yes.

MS ROSENBERG: -- which talks about the sturgeon population in that reach of the river. And it gives some details about the various places where sturgeon population use that reach of the river. And we are talking about several locations, including the Landing River, various rapids and falls upstream of Sipiwesk lake.

And then it refers to the field program conducted by the NRSCB, and I have come to understand that the NRSCB is the Nelson River Sturgeon Co-management Board. I wondered if your client had given you any information about that board, or if you were familiar with its functions and how it came about?

DR. LUTTERMANN: Yes, I have looked at that and I have spoken with members of that board.

MS ROSENBERG: Maybe you could help the Commission to understand then how that board

started and who started it?

DR. LUTTERMANN: Well, I believe that it actually -- it was initiated or requested by Cross Lake First Nation in response to concerns about the state of the sturgeon in the Nelson River. And that's one point I'm not clear about, whether or not it actually came out of a particular claims process, but I believe it may have.

MS ROSENBERG: I think the money to start it came out of a claim process, if I understand it correctly.

DR. LUTTERMANN: Okay.

MS ROSENBERG: But neither you nor I was around for that time.

DR. LUTTERMANN: Maybe for the general audience, a claim under the Northern Flood Agreement which Pimicikamak are signatories to.

MS ROSENBERG: Absolutely. Thank you for that clarification.

The main concern that prompted the board to start its work was about the condition of sturgeon in the Upper Nelson. Agreed?

DR. LUTTERMANN: I'm not sure about that.

MS ROSENBERG: All right.

But that board certainly went into operation in 1993, and the leader at the beginning was a man named Ernie Scott of Cross Lake. In fact, he is credited in the website with founding the organization?

DR. LUTTERMANN: Yes.

MS ROSENBERG: We could provide a whole lot more about the work of that co-management board, but what this paragraph of the EIS on page 6-8 is pointing you to is that a field program was conducted by the board in the Upper Nelson in order to establish a sustainable level of harvest, and that that survey concluded that large scale changes to the available habitat did occur as a result of Lake Winnipeg Regulation. And they cited a study by MacDonald in 1988, which was done for the board.

DR. LUTTERMANN: Yes.

MS ROSENBERG: The conclusion was that habitat availability was not considered to be a limiting factor for the sturgeon in the area, and that's what was cited in the EIS. Agreed?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And since that time, of

course, we have the stocking programs and we have the work of Manitoba in its 20-year program and continuing on into the future, and the other efforts by Manitoba Hydro that have been described for you here at the hearing?

DR. LUTTERMANN: Yes.

MS ROSENBERG: All right.

The next subject I wanted to review with you was this idea of the river as habitat connectivity. And you talked about it a good deal today. I think one of the places you might have talked about it was at slide 25. And if I understand -- that's your slide 25.

DR. LUTTERMANN: Yes.

MS ROSENBERG: Now, if I understand that concept correctly, it is that the river can be used for transportation over long distances of various, I guess what I have come to learn of as VECs, or elements of the environment, populations of one sort or another, might be plants, might be fish, and that you have to understand the extent to which the river has been used as a corridor?

DR. LUTTERMANN: That I have to understand?

MS ROSENBERG: One has to, in doing

the assessment, one has to understand that, one has to take that into account?

DR. LUTTERMANN: Yes, I would suggest this would be an important question.

MS ROSENBERG: And it is agreed, we agree. Although I've been told whether I agree or not is not important.

So we have the river as a corridor, we have populations, and now I want to think specifically about sturgeon, and we have some information about where those sturgeon live. I think if we look back at how this assessment was scoped, you will agree with me from your reading of the EIS that geographic areas were delineated based firstly on where the impacts of the Keeyask project would be?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And then looking at the populations, now we are talking about sturgeon and fish in general, the populations of fish that would be affected by the Keeyask project?

DR. LUTTERMANN: Yes.

MS ROSENBERG: Then we looked at all of the other things, past, present and future, which could affect those populations of fish.

That was the point of view taken in the EIS?

DR. LUTTERMANN: Um-hum.

MS ROSENBERG: Agreed?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And I think you have disagreed how you define population, right? You talked about meta populations as compared with populations?

DR. LUTTERMANN: Well, I'm not sure I disagree with the definition of population. But in the case of sturgeon -- maybe this is what you are getting at, maybe I should just let you ask the question. I don't think that I disagree on the definition of population.

MS ROSENBERG: Great.

So we have defined our population. And then, would it be important then, or a basic way of checking to go see whether you are dealing with the right population, and indeed whether the population that is affected by your proposed project requires the entire river corridor for its life functions, would it be a good idea then to do genetic studies to see if you are correct in identifying the population and where they live?

DR. LUTTERMANN: Yes, that can be

helpful, and I know that that has been done.

MS ROSENBERG: Great.

I thought maybe we could just for a minute look back at slide 22 from the aquatic presentation that was given by Dr. Schneider-Vieira and Ms. Matkowski at the beginning of the hearing. I think you have it in your package, in any case, it is called "Population Genetics". Do you see that?

THE CHAIRMAN: Yes.

MS ROSENBERG: I think enough people in the room probably have the package. Could we go on if we don't have the slide up?

THE CHAIRMAN: Sure.

DR. LUTTERMANN: Okay, got it.

MS ROSENBERG: In fact, you were familiar with the aquatic section of the EIS, Dr. Luttermann, so you may recall that there were genetic studies done, I'm going by memory now, but at Laval University of the sturgeon populations?

DR. LUTTERMANN: Yes. And they have determined so far that there is actually a fairly distinct difference between these populations in different parts of the river, specifically Burntwood and Grass River, and the populations in

Keeyask area, on the basis of genetics, even though there isn't a dam between those two sections. So that's quite an interesting finding.

MS ROSENBERG: Although there isn't a dam between them. In fact, where you see Kelsey historically, Kelsey, upstream of Kelsey is a distinctly different population?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And of course, before Kelsey Generating Station, you would have had Kelsey Rapids, agreed? That was a condition which was there in nature that might account for that separation?

DR. LUTTERMANN: Um-hum, yes.

MS ROSENBERG: Do you recall then that the information that was collected in those genetic studies demonstrated that the degree of separation reflected separation for hundreds of generations with an interchange of no more than one or two individuals per generation?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And that the conclusion, therefore, was that in this system, larger migrations historically, that is pre-hydro, had no relevance, or no role at all in maintaining

the fitness of populations? I'm not asking to you agree with the conclusion, I'm simply asking you if you recall that that was the conclusion of the study?

DR. LUTTERMANN: I don't recall that conclusion as definitive as that, but, yeah.

MS ROSENBERG: Well, the fact that the population --

DR. LUTTERMANN: Is that a quote from the University of Laval reports or --

MS ROSENBERG: I think that's a quote from the evidence that was given by Dr. Schneider-Vieira in this hearing.

DR. LUTTERMANN: Okay. Yeah.

MS ROSENBERG: All right. One of the other points you made was about potential impacts of water quality changes, and you connected that as well to the river as a whole.

Just on the water quality point, I think you probably are aware that that was studied in detail in the aquatic assessment, in the supporting volumes. And I've given you those sections in the package I have given you, some quotes dealing with the water quality in the Keeyask reservoir, in particular, and what was to

be expected based on influences from other parts of the Nelson River. You might want to look at page 6-36, the bottom paragraph, and as well page -- forgive me, yes, and the top paragraph as well. And those sections deal with the effects of water quality, it is an example of effects of water quality on forging habitat. Agreed?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And you had a chance to review all of that in detail in doing your work?

DR. LUTTERMANN: Yes.

MS ROSENBERG: One of the points you made today was about the potential impacts of Lake Winnipeg eutrophication, which you felt was increasing. You mentioned that today as well as in your report?

DR. LUTTERMANN: Yes.

MS ROSENBERG: You were concerned about the extent to which this may be having downstream effects on the water quality in the Nelson River?

DR. LUTTERMANN: Yes.

MS ROSENBERG: I think you were wondering if that had been assessed. You weren't familiar with any assessment of it?

DR. LUTTERMANN: I'm aware there has been water quality work done, but I haven't seen a report that specifically focuses on that.

MS ROSENBERG: On Lake Winnipeg eutrophication?

MS. LUTTERMANN: Yes.

MS ROSENBERG: I have given you an excerpt from the state of Lake Winnipeg report that's attached also to the package that you received. And if you look at -- I'm very sorry, I have just given you the excerpt, there is a state of Lake Winnipeg report, and you are at a bit of a disadvantage because this is simply an excerpt from it. But if you read at page 63, the bottom paragraph -- I think I will just read it for you, and I will just leave it with you to maybe wonder later whether you might want to read the whole report. But the conclusion at the bottom of page 63 is that:

"The average annual total phosphorous concentrations for the south basin and narrows of Lake Winnipeg exceeded 0.1 milligrams per litre in most years. Average total phosphorous concentrations in the south basin and

narrows appeared higher from 2005 to 2007 relative to concentrations from 1999 to 2004. However, this pattern was not apparent in the north basin." We don't have that CAMP map up any longer, but I think everyone can sort of picture it. And the north basin, in the estimation of our experts, would be what is relevant to discharge into the Upper Nelson River.

Can you see why they would come to that conclusion?

DR. LUTTERMANN: Because of the difference in the north and the south basin?

MS ROSENBERG: Yes, exactly?

DR. LUTTERMANN: Yes, I can see that, although I didn't see the work behind that, or it is not apparent. I actually have read this document before as well.

MS ROSENBERG: Okay. This is a report by Environment Canada and Manitoba Water Stewardship, and I don't think it is fair to examine you on it in any way. I was just calling it to your attention. You really didn't have an opportunity to see that before.

DR. LUTTERMANN: Again, I put that out

there as an example of a question that needs to be monitored on a longer term basis. And I'm aware of the CAMP program, and I think it is an excellent initiative that is taking place to begin to do basin-wide monitoring, and to start to do some interpretation of the data. Unfortunately, I don't believe that -- well, based on my discussions with individuals who are directly involved in that program, they are only going to be -- they have been trying to look at data compatibility over time for all of the historical data sets, and it looks like they are only going to be really trying to begin to standardize data collection protocol as of recently, and looking back to 2008. The CAMP program was initiated in 2006. So a historical perspective, there may not be the resources, it appears, committed to really trying to see what we can grapple from the historical data.

And this is something that Pimicikamak are, you know, deeply interested in is what have the changes been over time since the early hydro projects? And so that might be a gap there. But perhaps that could be filled in the future if we have the resources to really look at those data

and see what is truly useful. Some of it may not be useful.

MS ROSENBERG: Perhaps you will sit at the table sometime in the near future with some of my colleagues and talk that over.

Before we leave the subject of Lake Winnipeg, I just wanted to call your attention to page 3 of what I gave you, which just points out that Manitoba Water Stewardship has announced the Lake Winnipeg Action Plan, that makes a commitment to interim reductions and long-term reductions. I thought you would just like to know that Manitoba is working on that.

DR. LUTTERMANN: Excellent.

MS ROSENBERG: I have three last points, Dr. Luttermann, we are almost done.

You did refer to the IHA protocol today, I think, and you expressed some concern about the distribution of fish down the river.

DR. LUTTERMANN: I think I was just using, I was using that as an example of, you know, an acknowledgment that aquatic species travel up and down rivers, so the river as a broader entity is, you know, recognized as a potential ecological boundary.

MS ROSENBERG: Agreed.

I just thought you would be interested to know that the Keeyask proposal has been subject to an assessment done by the IHA, in accordance with the IHA protocol for sustainability assessment, and on that very point the Keeyask proposal received top marks. We won't go through that today, I will just leave it.

MS. KEARNS: Ms. Rosenberg, do you have a question about the IHA protocol?

MS ROSENBERG: I would ask Dr. Luttermann to take a look at it and confirm.

DR. LUTTERMANN: I have read that document, and I think there still remains much to be discussed about that. I think there are elements of the idea of sustainable development that are not necessarily being captured in that process. And it is a hydropower -- there is certainly merit to that process, I don't think it asks and answers all of the necessary questions.

MS ROSENBERG: Fair enough. All right.

One last point on the whole certainty of the mitigation program. I wanted to be sure that you understood, and your client understands

that the proposal that we are asking to be considered does not rely on the effectiveness or the certainty of success of any one mitigation measure, but that the confidence expressed by the proponent in these hearings and, indeed, by Manitoba Hydro, in the overall sturgeon recovery program is not based on any one measure, it is based on a long-term permanent commitment to the future of sturgeon in Manitoba.

The proposal that you've looked at you've mentioned has a minimum 25-year stocking commitment. But I wondered if you had a chance to look at Manitoba Hydro's Manitoba-wide lake sturgeon stewardship and enhancement program? I have put a copy of that in your package. I just wanted you to note that Manitoba Hydro has made a generational commitment, a 30-year commitment at minimum to Manitoba as a whole. And I wondered if that might give you some additional confidence?

DR. LUTTERMANN: I have looked at that and, again, I am delighted to see an increased commitment to mitigation, whether habitat is limiting or not. My concern is that when we are looking at building a new hydro development in the context of a system which has already been

severely degraded, and whether or not we talk about issues of fragmentation of sturgeon population, whether that's an issue or not. I believe it still could be regardless of the genetic analysis, it still could be an important issue, especially looking into the future with severely depleted populations, if we are not able to get enough brood stock, for example, from the local population in the Keeyask area, and if they are more severely affected than we hope during the construction period. These challenges have all been I think very clearly identified in the EIS. I simply believe that it is not an unequivocal conclusion that, with these commitments, that we are not necessarily going to have an increased impact on the local populations in the Keeyask area, and we are not necessarily going to ensure recovery of self-sustaining populations. I think that there is promise there, absolutely, there is promise, based on the evidence that exists and the increased level of commitment.

I'm concerned that the way that the project is being proposed, it makes it sound as if it will be, because of the project, that these commitments will, you know, enhance sturgeon

populations. Certainly, we could leave the existing functioning habitat in place, increase stocking efforts and increase habitat enhancement in other parts of the system, and probably have better results at the end of the day. And so it wouldn't be because of the project, it would be in spite of the project.

MS ROSENBERG: Because of the commitments that have been made?

DR. LUTTERMANN: Because of the commitments, absolutely.

MS ROSENBERG: I want to finish with one last point, and I think it has been made quite passionately. You said in your report, and you repeated something like it here today, about Pimicikamak asking what is left of the river and what will be there in the future?

DR. LUTTERMANN: Yes.

MS ROSENBERG: And that was important to your client.

You have seen me in the past, you have seen me representing Manitoba Hydro at the table with my partner, Bob Adkins. But here in these hearings I'm representing the Partnership. And the Partnership, of course, is comprised of

Manitoba Hydro as well as the four Keeyask Cree Nations. They have asked me to inquire of you whether you were familiar with the answers they have given to that question. And the way they phrased it for me, in putting the question to you, was that what will be left is a river developed for power generation that nonetheless contains potential for redevelopment of its fish and other aquatic resources.

DR. LUTTERMANN: I'm sorry, I'm not sure if I --

MS ROSENBERG: Were you familiar with that? That that's their position?

DR. LUTTERMANN: In general, I'm not sure that I have read that exact statement.

MS ROSENBERG: Let's turn to a statement that is in the EIS.

What you are seeing up on screen is a map of the Split Lake Cree study area for the Tataskweyak, or Split Lake Cree post-project environmental assessment, environmental review that was completed in 1996.

I don't know whether you have had a chance to look at any of that work that was done in the past?

DR. LUTTERMANN: I looked at parts of it, not the entire thing.

MS ROSENBERG: Perfect.

So what you are seeing up there is the study area from that PPER, post project environmental review. And I have put that up to show you that Keeyask is in the heart of the Split Lake study area.

DR. LUTTERMANN: Yes.

MS ROSENBERG: Great.

Just as a last comment, I would like you to look with me at a page from the Cree Nation Partners Keeyask Environmental Evaluation, and it is section 11.5 summary. It is page 3 of that summary that's in your package.

DR. LUTTERMANN: Yes.

MS ROSENBERG: And the last paragraph of that summary, and I wondered if you might just read that aloud?

DR. LUTTERMANN: "Our belief that the long-term benefits provided by the Keeyask project are likely to help restore harmony and balance in our homeland ecosystem as founded in this understanding and confirmed by our

analysis utilizing the ancestral homeland ecosystem model."

MS ROSENBERG: Thank you.

And I think you confirmed as well, in your testimony as well here today, that if it makes sense to the people in the local area, that that would be something that you could support as well?

DR. LUTTERMANN: Yes. But as with every other aspect of this kind of decision, it is much more complex, I believe, than the way it has been presented in the EIS. And I have not had the opportunity to meet the people who have been very closely involved with this process. Again, I don't have a vested interest in this project one way or another. I truly hope that the ideas of harmony and balance are something that people can work towards. But, unfortunately, the only individuals that I have heard from, from those regions to date, are people who don't agree with this statement. And they will -- there are people in every community that disagree. In every one of our communities we have differences of opinion. But there are people who have come to talk to me, you know, completely out of the blue, and very

passionate that regardless of the effort that's been made, they are not satisfied with the results, and feel a great sense of discomfort with the statements that a project like this will restore harmony and balance in the homeland ecosystem.

People have talked about, well, okay, maybe this is our only choice and maybe we can have employment for our children, because we don't have any other choices here, and so maybe this is going to be something good for us. It is better than simply allowing it to go ahead and not participating in it.

And it is the feeling of fatalism and being stuck between a rock and a hard place, which is exactly the same sentiment that I have heard from people clear across Northern Canada, that they feel these projects are imposed on them, that they don't have a choice, and so they have to partner, otherwise they are left out in the cold and they are left to grovel for every little bit of compensation that they might get for what they see as extensive and devastating damage to their landscape.

So the responses that I have heard

from people and, again, this is purely, you know, individuals who have come to talk to me simply because I happen to be around and talking about this issue. So I think that, you know, hopefully, I would hope that it is the majority of people who agree with this statement. Maybe it is. I don't have the basis to say one way or another.

MS ROSENBERG: Thank you, Dr. Luttermann. And I think that's a perfect segue to the going forward panel, which the Commission is anxious --

THE CHAIRMAN: Not exactly. You are jumping the gun here. You were anxious to take over my role just before lunch.

MS ROSENBERG: I don't have a grasp of the procedures. Thank you, Mr. Sargeant, those are my questions. And thank you Dr. Luttermann for traveling here, and I hope your travels home will be safe as well.

DR. LUTTERMANN: Thank you.

THE CHAIRMAN: There are no other questions from the partnership?

MS ROSENBERG: I believe I was speaking for the partnership.

THE CHAIRMAN: Thank you.

I know we have had other cross-examinations where any number of the partners add to it.

Participants? Consumers association?

MR. WILLIAMS: Good afternoon, members of the panel and Dr. Luttermann.

The panel should have a document, on the front page it should say ESA in big small case letters.

THE CHAIRMAN: Big small letters?

MR. WILLIAMS: Yes, I believe I was accurate in that statement, Mr. Chair.

THE CHAIRMAN: You were very.

MR. WILLIAMS: And I also will be referring to Dr. Luttermann's written report, and starting at page 6, not the powerpoint but the written report.

Dr. Luttermann, directing your attention to the third paragraph on page 6, you suggest that a naturally functioning riparian corridor of a large river should be considered to be one logical and meaningful VEC for a landscape level understanding. Agreed?

DR. LUTTERMANN: Yes.

MR. WILLIAMS: And in terms of the

word "should" that appears in that sentence, Dr. Luttermann, what I'm trying to understand is, are you arguing that it should be included because it would make a modest improvement to the EIS, or it should be included because its omission would be the omission of a critical threshold VEC?

DR. LUTTERMANN: Well, I'm not sure that we are at a state where we can define a critical threshold here. But when we are looking at an environmental assessment for a hydroelectric project, which creates a dam and a reservoir in a system which has already, already has several dams and reservoirs and downstream effects, I believe that in order to understand over the long-term the health of many different species potentially, we have to understand resilience. And if you have a species that are depleted in one area of the river system, and then depleted in another area, and another area, and you have fragmentation on top of that, we are reducing the resilience of populations of species across the whole landscape in order to give opportunities to repopulate areas. So I think from a long-term conceptual perspective, looking at health of populations over time in a system like this with multiple hydro

projects that selectively affect certain types of habitat, that it is a logical way to approach cumulative effects assessment. And if we don't do that, even though we do have data from other parts of the system, if it is not put together and understood in some kind of a comprehensive analysis, I believe that we might be -- we probably would be missing an understanding of several important cumulative effects.

MR. WILLIAMS: So just to be clear, in your view this is not a minor omission?

DR. LUTTERMANN: No, it is something that I have been harping on for years. And it is also something that is identified in other major hydroelectric assessments across Canada as a problematic area in cumulative effects assessment.

MR. WILLIAMS: Thank you.

Turning to page 7, you cite the work of Robert Naiman on a couple occasions. Would that be correct?

DR. LUTTERMANN: Yes.

MR. WILLIAMS: And I've shared with you over the lunch break the article from Dr. Naiman et al from 1993. You have that?

DR. LUTTERMANN: Yes.

MR. WILLIAMS: And that indeed is an article that you cited at length in your paper?

DR. LUTTERMANN: Yes.

MR. WILLIAMS: Just for a little background on Dr. Naiman, he, you will be aware, just last year won the eminent ecologist award from the Ecological Society of America?

DR. LUTTERMANN: Yes.

MR. WILLIAMS: And he is on the science advisory board for the group overseeing the restoration of endangered fish in the Columbia River?

DR. LUTTERMANN: Yes.

MR. WILLIAMS: Now, I want to direct your attention to page 210 of Dr. Naiman et al report, under the heading of riparian corridors. And you will see about seven or eight lines down, three sentences down, the statement:

"We also view the riparian corridor as the heart of the drainage basin since it may be the eco-system level component most sensitive to environmental change."

Is that a statement that you would agree with, Dr. Luttermann?

DR. LUTTERMANN: Yes. Well, it depends on the pathways, I guess, of change. But absolutely, I would agree with regards to hydroelectric projects on a river system.

MR. WILLIAMS: Okay. And we will spend a bit more time on the next quote. Under implications for science and policy, the second sentence at about line four, you will see the statement:

"Recognition of the riparian corridor as a significant landscape component in maintaining regional biodiversity also offers significant advances resolving issues related to endangered species, cumulative effects, water yield and quality, and sustainability."

Would that be a statement that you would be supportive of, Dr. Luttermann?

DR. LUTTERMANN: Yes, I believe that there are many issues that are supported by that statement, yes.

MR. WILLIAMS: Naiman et al used the words "significant landscape component." How do you understand them to be using the term in this

context?

DR. LUTTERMANN: Well, given that riparian corridor, and again we are talking about the shores of the river, backwater areas, everything that's influenced basically by the flow of the water, that is the kind of zone in between the upland terrestrial environment and the aquatic environments, that these parts of the landscape, when they are connected along a river -- and this doesn't mean connected side-by-side within a few metres of one another, but you have patches of different kinds of habitat that species can move between and that, in fact, that connectivity of the river is partly what forms those habitats in the first place. So if we are truly going to be trying to wrestle with this concept of ecological function and process, the river hydrological system is a fundamental ecological process. And the cumulative effects assessment legislation wants us to look at processes because they are important. So the natural hydrological processes and how they are affected, and how they affect riparian habitats within that concept could be very easily seen as a component of a landscape, and an important one to assess, try to gain an

understanding as a whole.

MR. WILLIAMS: So the reality of the riparian corridor as a significant landscape component influences your recommendation that it is a critical VEC for the analysis of hydro affected --

DR. LUTTERMANN: Yes, it makes sense to me from what I have seen over the years in different river systems.

MR. WILLIAMS: If I could ask you to turn to page 17 of your written report?

We may come back to the ESA document in a moment.

Dr. Luttermann, on page 17 and throughout that page, but particularly at the bottom of the page you highlight some of the experience associated with the efforts to repopulate the Columbia River with white sturgeon. Agreed?

DR. LUTTERMANN: I highlight? Maybe I should make it clear too for people who have looked at this for the first time that the areas that are underlined are not highlighted, but they are additions to a revised document that I submitted from the first one that I submitted.

MR. WILLIAMS: My question was unclear.

You discuss, on this page you are discussing some of the experience on the Columbia River in terms of efforts to revitalize certain fish populations, including white sturgeon?

DR. LUTTERMANN: White sturgeon, yes.

MR. WILLIAMS: And in the quotation at the bottom of the page, would it be fair to summarize that as saying that some of the short-term objectives were met, but there have been, to date there has been a failure to achieve many of the longer term objectives?

DR. LUTTERMANN: Yes. Although if I could qualify that, it would just be quicker, if you look at re-establishing natural population age structure and achieving target abundance levels, but particularly natural population age structure, given the long lived nature of this species, and white sturgeon are very similar to lake sturgeon but bigger and a few other differences, this will take a very, very long time. So this statement doesn't necessarily mean that this is not possible to achieve, it means they haven't achieved it to date. It was recognized that it would take a long

time to achieve that.

MR. WILLIAMS: What is the significance of these references for the purposes of your paper? What is the lesson we should be drawing in terms of the Colombia River experience?

DR. LUTTERMANN: The reason I put this in here is that there has been significant multi-jurisdictional work done on recovery of white sturgeon in this river system, which also has multiple dams and impoundments. There has been some international effort put in -- well, the Columbia River flows into the United States, so there is effort as well. They began stocking only back in 2002, which I didn't put that in here, it is a shorter term stocking program to date than we have looked at in some of the examples from Nelson River and other parts. But the lesson from this, the reason I put it in here is because there has been substantial effort, and they are quite concerned that the objectives are not being achieved. And one of the reasons is a complete failure to really understand what is limiting recruitment. And so whether habitat is a limiting factor, there is a complete or virtual failure of recruitment in many parts of this river. The only

parts that have significant or remaining population segments are riparian and significant riverine habitat.

So it is complex, it is a different river system entirely. And we have seen remnant populations in the Nelson River and in other rivers that are in reservoirs, impoundments, and below dams and so on. But they are mostly not healthy and they are mostly not, you know, there is still problems with recruitment and understanding what is limiting recruitment.

So it is the uncertainty in this. The reason why I put that material in there is to understand that we have a lot of questions still to answer, despite the effort that's been put into it. The progress, probably in our understanding, has been probably exponential in the last 20 years or so. And that's a good thing, but we are not there yet.

And in this system they are, Columbia River, they have started making attempts at doing analysis of cumulative effects of multiple dams in the Canadian part of the river, doing mapping of the whole river, and trying to look at some analysis of what the total effects -- and it is

only at the beginning stages. And I was at a watershed symposium just a few weeks ago which is looking at developing an international Columbia River basin-wide kind of management framework to try to deal with these issues of not just cumulative effects, but how can we look at this whole system and figure out, are there ways that we can look at the hydrology of the whole system and figure out where can we maybe make some changes to improve habitat? So that might involve trade-offs between the economics of one part of the system and the other, for example. Right.

MR. WILLIAMS: So just to follow that answer through in two different ways, would I be correct in suggesting to you that one aspect that you are suggesting is that the need, in essence, it is a cautionary tale, and that we need to be leery of being overconfident in terms of our expectations of even the best intentioned mitigation and recovery plans?

DR. LUTTERMANN: Yes, absolutely, we need to be cautious.

MR. WILLIAMS: Secondly, I think you are suggesting to us, I will ask you to agree, that a key learning from the Columbia River

experience to date is of the inefficiency of looking at subsections and about the need to look at the system as a whole?

DR. LUTTERMANN: Well, that's a conclusion that people working in the Columbia River basin have come to, based on their experience.

MR. WILLIAMS: I will play devil's advocate with you for a second.

Might we argue that the Nelson River system is beyond environmental redemption and should be primarily devoted to the business interests of Manitoba Hydro and its partners?

DR. LUTTERMANN: I think it would be creating a gross injustice if we came to such a conclusion.

MR. WILLIAMS: Is -- in your view, this is a system that is still capable of environmental redemption?

DR. LUTTERMANN: Yes, absolutely, I think it is. Boreal systems are incredibly resilient, and so if we -- and that's a statement that I actually took quite a great exception to in the EIS, where it was kind of a statement made on behalf or by the Cree Partners that we understand

that nothing can be done to fix the damage that has occurred from the past. And I feel that is quite a -- I don't know if people have been convinced of that, but I don't believe it is true.

Because we can -- one of the things that has altered the system is the regulation of the water. We can change that. Although there have been a number of different, you know, legal agreements that Manitoba Hydro is suggesting they can't get out, for example, they promise to maintain Split Lake water levels within the regime that currently exists. Obviously, people don't want things to change again, more uncertainty. But is that actually the best decision to make at this point in time? I don't know.

But certainly all over North America and in other regions, people are looking at, well, maybe we need to take this dam down, maybe we need to change the operations. And this is what they are doing in a complete review in the Columbia River as well to look at operations of the dams, and in many other places, especially places where there is anhydrous fish, salmon in particular, because it is so much easier to grasp the effects of that. They are looking at, how can we change

the operations of dams in order to create a better balance between the habitat quality and the needs for power generation and revenue generation?

MR. WILLIAMS: And just on that point, just to turn finally to page 21 of your written report?

DR. LUTTERMANN: Okay.

MR. WILLIAMS: In the second last paragraph towards the bottom of the page, I will suggest to you that you discuss a variety of ways in which the river might be managed differently, which should be investigated in order to see if it would assist in the redemption of this river system?

DR. LUTTERMANN: Yes.

MR. WILLIAMS: And is that what you were just speaking of in terms of the Columbia River experience, or is there more to it than is set out here on page 21?

DR. LUTTERMANN: You mean in terms of the specifics, periodic spring flooding, or do you mean other types of studies?

MR. WILLIAMS: Perhaps you could elaborate a little bit on some of the other tools that are being employed?

DR. LUTTERMANN: Okay. Well, certainly looking at fish passage in existing structures, perhaps this has been done in the Nelson River. I haven't seen any studies for, you know, can we look at fish passage at Jenpeg, at Kelsey, what would be, you know, the purpose of that? Is it important to do that or not? Is it feasible to do that or not? What would be the trade-offs, et cetera, et cetera? That is something that is being done, again, especially in rivers with anhydrous salmon because it is such a clear high value fish essentially.

MR. WILLIAMS: Thank you very much, Dr. Luttermann for your time.

THE CHAIRMAN: Thank you, Mr. Williams.

Fox Lake?

MR. KULCHYSKI: I'm Peter Kulchyski with Concerned Fox Lake Grassroots Citizens.

And I thank you for your report, I learned a lot from it. I myself am trained around Aboriginal rights and cultural issues. This was kind of in certain respects a revelation to me.

There is a couple of things that I want to get clear in my mind. One was, you know,

the kind of natural inclination is to think that the Keeyask dam is far, far downstream from Jenpeg, so it wouldn't have any effects in that area. And am I understanding you correctly in what you are saying is that when Keeyask goes on system, it means that the decisions that are made in Jenpeg and the decisions made in the intervening dams all start to change because of the presence of the Keeyask dam? Is that sort of how -- one of the ways in which it will affect the system?

DR. LUTTERMANN: Well, I think one way that it could affect the system is that essentially, when the decisions are being made within the constraints that exist, so if between -- is it 711 and 715 feet above sea level -- Manitoba Hydro has the right to operate the reservoir at Lake Winnipeg for hydroelectric production. So if it is above the higher level, they have to release as much water as possible, that is the capacity through the Jenpeg Station. And if it is below that, then the Minister of Conservation and Stewardship has decisions to make about how much water to allocate to power production and how much water to allocate to other

values within Lake Winnipeg.

So within that range there are many parameters that are put into a modeling system, and the splash model is one of the ones that's used to try to look ahead two weeks, looking at -- the water flows, the capacity basically that exists in the downstream generating station is one of the parameters that's considered. And how much power can be generated and how much money can be made from that power if it is generated at that point in time? And what would the cost be, for example, if we held back more water in Lake Winnipeg, generated less power in the present time, but generated more power later on, sold that power for a higher revenue? So this is kind of a balancing act to try and make the most of it, basically.

And that water, as it flows down the river, it gets -- it goes through several generating stations, so you have the opportunity to generate power at several different points in the river from the same water. So that makes more efficient use of the water essentially.

If you put another -- so you have a certain capacity depending on the amount of water

that you have downstream. If you put the Keeyask project there, then you have higher capacity and you can generate more power from, well, collectively Kelsey and Keeyask and Kettle and Limestone and Long Spruce.

If you hold water back, and because down the system there is no long-term storage after Lake Winnipeg down through the system, not long term. There is sort of daily and weekly storage capacity. So you hold the water back until, you know, a day later or a week later, there is a certain amount of capacity there.

So once it leaves Lake Winnipeg, it goes down the system, and you basically can't hold it back for too long at each point in the system.

If you have higher capacity lower down in the system, and I'm sure, you know, Manitoba Hydro could explain this quite well with lots of good graphics. But if you have a higher capacity downstream in the system, and you are making these decisions, let's say we are going to hold more water back in Lake Winnipeg and forfeit some of that potential revenue right at the present time in hopes of making more money on it later on, the cost of that is actually quite a bit higher than

if you are foregoing certain capacity downstream, especially if you have invested a lot of money in building that extra capacity.

So it might -- it will probably, so it will change the balance basically of the economics of the decision at that particular point in time. And it is not probably going to be the same decision on October 12, 2017, as it would be the same date 2020, because it depends on the flow into the system, right?

So the point that I was trying to make, which is probably not very clear at all, is looking at how erratic the water levels already were in these downstream reaches, that are not reservoir -- so Cross Lake is not a reservoir but it is affected from Jenpeg -- that there probably will be changes. It could be higher one day. I don't know if you want to say on a daily basis or weekly basis, or a couple of weeks basis, based on the fact that Keeyask exists downstream, whether or not there would be a positive effect or negative effect, you can't say because it is so variable from one year to the next.

One thing that I could also say, though, in terms of the decision making around all

of this is that, you know, we have a certain domestic demand, or Manitobans do, and we have also the export revenue potential, which is extremely important to the economics of this province, as well as most other provinces that rely heavily on hydroelectricity.

So, this is a long answer, but I have been trying to get at this. In some ways, if this system was designed to also consider cultural and ecological values, if we have greater capacity as a result of Keeyask, we could potentially have greater flexibility in a system maybe. But it costs money, right, it will all cost money, whenever you potentially forego revenue. And how that weighs against how much this is all going to cost at the end of the day, I have no idea. But I think it will have an effect on decisions that are made on the releases of water from Lake Winnipeg, and it can go either direction, one way or another.

So when they make the statement that there are no discernible or detectable differences, given the context of the current water level regime and so on, I think that statement is accurate. What it actually means for

the people living downstream, on the other hand, is not at all clear. But it is not going to have any kind of a consistent three feet higher in August kind of effect.

MR. KULCHYSKI: That starts to get to my next question, which was, I was very interested -- I'm interested in the fact that you are trying to take a less adversarial approach, and I think that that's something that we all have to look towards, however we can manage it. And I'm a fairly adversarial guy myself, so I'm probably as responsible as anyone for being adversarial in this context.

DR. LUTTERMANN: I wasn't accusing anybody.

MR. KULCHYSKI: I'm only self-accusing. But I'm interested in the sort of regulation of the dams for cultural and ecological factors, part of what you had to say and what you just broached again. You answered one of my questions which was, would the Keeyask make it more or less possible. So there is a way in thinking that might make it more possible.

Would the critical thing there be to sustain less variability, or would the critical

thing there to be to try to use the dams to more mimic the natural water cycle?

DR. LUTTERMANN: So mimicking the natural water cycle is certainly what we would be getting at. In order to produce hydroelectricity at the periods of the year that you need it most, we create reservoirs. Otherwise we would stick the turbines right in the river and use the natural flow. So there is no way that you can have a system in a northern river system and heat people's homes in the winter time and have a natural hydrological system. There is no way to do that. But since you have a system with so many different points, you have storage capacity, and you have, you know, peaking capacity -- if everybody understands what all of that means -- that, you know, there is a certain flexibility in the system to try not to create as erratic water levels that we see in certain parts of the system.

And so riparian habitats, we talked about many aquatic species as well, they thrive, they have evolved within a system of variability. We don't want stability, but patterns of change in the river system, which are according to seasonal patterns, are what has formed the characteristics

of the system.

So, yes, definitely working towards in whatever -- and I don't know what the possibilities are here. I think that that would require a great deal of analysis. But certainly in other river systems in other places, hydroelectric production is not the only objective that is trying to be met as it is primarily in this system.

MR. KULCHYSKI: Thank you.

And then all of that is to do with more leaning on the geographical scope. But in your report you also talk about the temporal scope. I'm just wondering, in your view, what baseline is most appropriate for the environmental studies of the impact of Keeyask, prior to development at all, or beginning with the existing conditions?

DR. LUTTERMANN: I think that the legitimate questions that people have who live in the region would suggest that a pre-hydro development baseline would be the appropriate place to start.

MR. KULCHYSKI: Thanks.

And then finally, how helpful was it

to you in your research, you know, to travel with local hunters and fishermen actually directly and have them point out things to you? Do you think that that's something -- I didn't see evidence of a lot of that in the EIS. I'm just curious from you as a science based person actually how helpful that was for you?

DR. LUTTERMANN: It is essential, it is absolutely essential. I have not -- and to be clear, I haven't done research in the Nelson River. The work that I did in the Churchill River in Labrador, I did with Innu and Metis elders and young people, and we did field surveys together. We travelled the river by canoe, we didn't go by helicopter. We spent weeks and weeks on the river. And I went back with my kayak and travelled around the reservoirs when I had to be by myself because it is a bit safer in the kayak. But in terms of what I learned from the people who have spent their whole lives on the river, there is no way that I could equal that as a scientist. But to be clear as well, my first realm of study after art school was I did a degree in cultural anthropology at McGill University. And this is when I first got wrapped up in all this hydro

stuff, ending working with Richard Salisbury and Collin Scott at McGill, who had been working extensively with Cree in the James Bay northern Quebec area. So I did some work at that time on the James Bay Northern Quebec Agreement, and subsequently did travel to the area. There is no way that I could even begin to describe what one can learn from traveling the land with people who have spent their lives there. There is no comparison.

MR. KULCHYSKI: Thank you very much.

THE CHAIRMAN: Thank you Dr. Kulchyski. Ms. Whelan Enns?

MS. WHELAN ENNS: Excuse me, croaky again.

Thank you for your contribution and your reports today. I have a couple of quick questions for you that have to do with species.

Would it be a correct statement that the international, and the large international ranking systems for species globally, like what the IUCN has done through the red list, are based on fairly large global regions where they take a look at a species and sub species in fairly large global regions?

DR. LUTTERMANN: Yeah, they are considering the global context, yes.

MS. WHELAN ENNS: Thank you.

DR. LUTTERMANN: Although, just in the interest of time --

MS. WHELAN ENNS: Feel free to improve on what I'm asking you and concluding if I'm off on the science.

DR. LUTTERMANN: Yeah. I would say that I haven't spent a lot of time looking at their specific assessment protocol, partly because I believe that the local and regional areas where a species exist, even if it is a boreal species that is widespread, because we are always coming to conclusions to say, well, it's okay, there are bears over there, you know, there is more caribou over there, there is a lot of habitat. And we could conclude that without doing any kind of environmental assessment whatsoever. For boreal species, they are mostly wide ranging resilient species. And we have, I think we have a bit of complacency, especially with the level of industrialization that is happening in the boreal environment recently. So I don't pay a whole lot of attention to those things, I must say, so...

MS. WHELAN ENNS: Thank you.

Could it be possible that some of these global assessments and rankings for species are actually watching what, for instance, the scientists in Canada or the scientists in another country have concluded and assessed in terms of certain species, that they follow, that they could in fact follow the assessment and science inside a country when they are making an assessment, and take it into account?

DR. LUTTERMANN: I'm not sure if I understand your question. That they are able to follow or that they do?

MS. WHELAN ENNS: More that they would take their cue and pay attention to what the scientists in the national or regional geography --

DR. LUTTERMANN: All I would say is I hope they do.

MS. WHELAN ENNS: Thank you.

Would you be surprised, Dr.Luttermann, and again I have been online because I was curious about the red list during your questions from the proponent. Would you be surprised to know that the red list 2004 information about lake sturgeon

does not include the Nelson River or any of the rivers that flow into Lake Winnipeg?

DR. LUTTERMANN: That would be surprising, yes.

MS. WHELAN ENNS: Thank you.

The proponent has consistently aimed for, I believe, aimed for and also noted that they are taking a precautionary approach in terms of assessment of species, assessment of the VECs, and sub topics in the EIS. Trying to avoid making a statement, then my question for you is, do you at this point consider their plans and aims for lake sturgeon to be precautionary, or precautionary and sufficiently precautionary?

DR. LUTTERMANN: It is always difficult to decide what is an adequate level of effort, I guess. And part of the precautionary approach is to commit to making efforts to protect the environment, if that's what we are looking at, even in the context of scientific uncertainty. So even if we don't know for sure that habitat is limiting sturgeon, for example, we should perhaps, if we are going to be very precautionary, we would still go and try to do some habitat enhancement if the populations are very low, even if we can't

prove or know for sure one way or another whether or not habitat is limiting. So that's one aspect of it.

I think that there has been a fair amount of effort put into I think -- I don't know what words to use, but I'm pleased with the effort that I see towards mitigation for the Keeyask project. But what I see is problematic is that when the conclusions are presented to the public, when we are in a context of trying to make a decision about a project which will cause habitat loss, we know for sure, and we maybe try to convince people that the results at the end of the day, long term down the road are, you know, maybe more predictable than we really should be saying, I don't believe that's very precautionary. And I believe that we have to accept as a society that there are risks with these large projects, that we are going to be causing habitat damage every time we turn on the light. And if we try to sell projects with the idea that, no, it is all okay, which is the general tone of the conclusions in this. That is not helping us as a society either, to really look at demand side management or to consider alternatives, it is not precautionary to

take that, to take that view of it. I think we need to have everything on the table and we need to be clear that if we build more dams on this river, it will cause additional environmental degradation. And we can do as much mitigation as we want, but there is certain things that can not be changed at the end of the day.

MS. WHELAN ENNS: Thank you.

I have two remaining quick questions for you. And this goes to what you've said about your experience with rivers and dams, other than this assessment. Could you give us a name or an example of a fish species in a river and hydro system in Canada that, once it was listed as threatened or endangered, returned to normal status?

DR. LUTTERMANN: To normal? What do you mean by normal?

MS. WHELAN ENNS: Well, this would be the habitat and health of the species before assessments and before listing, are there any examples of a fish species in a river and hydro system where the fish species, in fact, went back to its status before being reviewed, assessed, investigated and listed as being threatened or

endangered?

DR. LUTTERMANN: Not that I know of.

MS. WHELAN ENNS: Thank you.

Are there yet any examples of hydro dams in Canada being decommissioned or taken out for the kinds of reasons that you were describing in terms of the Columbia River system?

DR. LUTTERMANN: Not in Canada, not for large projects, no.

MS. WHELAN ENNS: Thank you very much.

THE CHAIRMAN: Thank you, Ms. Whelan Enns.

Panel members? Mr. Yee?

MR. YEE: Thank you, Mr. Chairman, I just have a couple of quick questions for clarification.

One of your slides, I believe it was slide 16, you were looking at the shoreline of Sipiwesk Lake and you had some observations, but you used the term informal survey. Can you explain what you mean by informal survey?

DR. LUTTERMANN: So, I did not do any, I've not done any fieldwork in this area. We visited that area with a group of Pimicikamak citizens on one day only to go to visit the Duck

Rapids site, that Roy Muswaggon wanted to show me how this whole area had completely been washed out and how upset he was about this. And this is close to the forestry landing point, close to the boat dock here. And so just I walked up and down the shoreline. And I've done surveys in other river systems where we basically would take from the low water to the high water mark, and a 200 metre section, and that would be our sample plot, and we would look at basically the richness of the species, the number of different plants that you could find in area like that.

So I just, you know, walked down a section of this shoreline out of curiosity to see what was growing there. That's what I mean by informal. I haven't done any formal riparian surveys. And it is something that, not me personally, but I'm sure that there are many excellent, I know that there are many excellent terrestrial biologists in Manitoba who could do such work in other parts of the Nelson River. And I don't believe that that is part of the CAMP program. It is aquatic monitoring, but it is not riparian monitoring.

MR. YEE: Thank you very much.

THE CHAIRMAN: Mr. Nepinak.

MR. NEPINAK: Good afternoon, doctor, I have some questions for you.

In your written report you mention Pointe Du Bois Generating Station and you kind of use that as an example, but are the two rivers, don't they have a different environment from each other?

DR. LUTTERMANN: The Winnipeg River and the Nelson River? Yes, there are quite a few differences, absolutely, in terms it of, yeah, magnitude of the flow for one thing, and the way that the generating stations are operated. Some of these, some of these, you know, primary physical differences have been taken into account in the planning for mitigation at Keeyask.

MR. NEPINAK: Planning for?

DR. LUTTERMANN: For the mitigation for fish spawning habitat at Keeyask, yes. But there are, of course, many different physical differences even in terms of climate and, you know, the seasonal changes that, you know, it is almost infinite the differences that could differentiate those two systems.

MR. NEPINAK: Okay. And you mentioned

the Cree worldview and science. I'm really glad of the way that you kind of married the two. That's leads me to a question that I have been thinking about and not asking, and that's mitigating. Can you explain mitigating to me?

DR. LUTTERMANN: Mitigation, has not been defined here?

Me, I guess the root of the word, mitigation, like migraine, it really only means kind of fixing it up maybe halfway, right? It doesn't mean to completely compensate for an effect, or bring something back to the way it was before, but it means to try to lessen the effect to some extent, or the consequences of the effect.

MR. NEPINAK: All right.

The reason I ask is that I speak Ojibway, and I'm trying to find a word in Ojibway that's similar and I can't think of one. The only one that I can think of is ***Kay okay tune, which is basically a word for fix.

DR. LUTTERMANN: Fix.

MR. NEPINAK: And I don't think that I have ever heard anything in Cree, we have some Cree speakers here, but I believe that Kusyakatoon is almost Cree. And it is just an observation I

wanted to make, because we don't have, like I said, in Ojibway we don't have a word for that.

DR. LUTTERMANN: That's a very interesting observation. Because the word mitigation is not something that the average English speaker bats around too much either. Right? It is very much used in a specific way in environmental assessments and so on. I would not translate it as to fix for sure. Maybe better to try to describe to people that mitigation is kind of an effort to reduce the seriousness of the effect. And so it could be something that's direct, trying to enhance the habitat quality, or it could be, you know, paying for an arena or something that kind of makes people, you know, gives something back to people for what they have lost. But it could be something completely different. But the idea that it is going to fix is certainly not, I think, what most people would mean by that.

MR. NEPINAK: All right.

I also want to take you to page 14. And we've seen this map before.

DR. LUTTERMANN: In my report?

MR. NEPINAK: Yes. It is right there.

We have seen this map before and I'm going to ask you pretty much the same questions that I asked the presenter last time. We can see the Nelson River, and you didn't colour any of this, or the Burntwood River going up into South Indian Lake?

DR. LUTTERMANN: That's right.

It is just an excerpt from the land sat images, and it would probably be a composite image.

MR. NEPINAK: Do you know about what elevation you took this at?

DR. LUTTERMANN: Not offhand, no. So it is the land sat -- I could find that out for you, if you would like.

MR. NEPINAK: Okay.

Now, South Indian Lake, we can kind of see Churchill over there. We really can't make out the Churchill River, well, we just barely make it out. In the other picture, it was actually wider, but we are having a hard time seeing the Churchill River going to the left.

DR. LUTTERMANN: Um-hum.

MR. NEPINAK: Why are we seeing this portion of the Churchill, the Rat and Burntwood, as well as the Nelson, why is it so highlighted?

DR. LUTTERMANN: Why is it so light in colour are you asking?

MR. NEPINAK: Yes.

DR. LUTTERMANN: Well, it is primarily because of the levels of turbidity in the water. You have to be a little bit careful, you would have to look back at the data and the time of year. It looks like as if there is no snow cover, you still could have ice cover. And if it was a composite image to an extent, or if you have cloud cover, you have to look at it pretty carefully. But as you noticed, it is fairly consistent how turbid the water is in the whole river.

I have looked at some older air photos because it is a question that I had too, and certainly seen there are parts of the Nelson River and large rivers in general that experience high levels of turbidity as part of their natural state. But I'm not so sure that that's the case with these entire river systems. It would have to be looked at more closely, and maybe it has been.

MR. NEPINAK: All right. Thank you.

THE CHAIRMAN: Thank you, Dr. Luttermann. I have just one question.

You mentioned Site C, which is a

northern B.C. hydro project?

DR. LUTTERMANN: Peace River, yes.

THE CHAIRMAN: Is it the one where the environmental review board sent the proponent back to conduct more environmental studies?

DR. LUTTERMANN: Well, yes, they have. It is undergoing currently a joint review panel assessment.

THE CHAIRMAN: And it was a joint review panel that sent them back to conduct more studies, is that correct?

DR. LUTTERMANN: Yes.

THE CHAIRMAN: Thank you.

That is all we have for this witness. Thank you very much. Thank you for preparing your paper and presentation today. And I hope you have an easier trip home.

DR. LUTTERMANN: Thank you very much.

THE CHAIRMAN: We will take a break until 3:30. We will return with the going forward panel. I can guarantee you we won't be out of here at 4:30 today, but I don't know how late we will be here. So come back in 15 minutes.

(Proceedings Recessed at 3:15 p.m. and reconvened at 3:30 p.m.)

THE CHAIRMAN: Mr. London?

MR. LONDON: Just before we -- just before we start, I just wanted to let you know that immediately upon the conclusion of this afternoon's programs, downstairs in the Provencher room on the main floor is the Pitblado annual party. Everyone is welcome for a drink and bite and to have some merriment. It starts at 4:30.

THE CHAIRMAN: Will we have any concerns about conflict of interest?

MR. LONDON: Absolutely.

THE CHAIRMAN: I thought you would say that. Thank you for the invitation but...

We will reconvene this panel. We left off some time last week, I think it was Wednesday, we had completed some of the cross-examination. I believe we still have Pimicikamak and Manitoba Wildlands and Consumers Association. I also understand that for a couple of very valid reasons we can not go beyond 5:00 p.m. So hopefully we can conclude the cross-examination by 5:00 p.m. and we can excuse this panel. If not, we may have to put them on next July or something.

Anyhow, Pimicikamak, Ms. Kearns?

MS. KEARNS: Thank you.

This is going way back, but I believe it was Ms. Saunders and Councillor Neepin mentioned in your presentations the use of best practices. And I'm wondering if you can elaborate on what you meant by that phrase?

MR. LONDON: Could you give them a context?

MS. KEARNS: This is so long ago.

MR. LONDON: That's why they need a context.

MS. KEARNS: I would assume they would have their speaking notes in front of them again. If none of you remember using the phrase, we can move on, unless if you have a recollection of saying best practices and can let me know what you meant by it?

MS. SAUNDERS: If you are referring to the presentation I made for York Factory, is that what you are referring to?

MS. KEARNS: Yes.

MS. SAUNDERS: Give me a minute.

Best practices, York Factory would mean that using the Cree worldview and our traditional, and our customs like to implement in our programming.

MS. KEARNS: Thank you.

Councillor Neepin, do you have any -- no, okay. I believe it was Ms. Northover, you spoke about reporting to regulators about monitoring results, is that correct?

MS. NORTHOVER: I did, correct.

MS. KEARNS: Will the results of monitoring be shared with any other groups, other than the Partner First Nations?

MS. NORTHOVER: All of our monitoring results will be posted on our Keeyask.com website, so they will be available to the public at large.

MS. KEARNS: And will any funding be provided to Aboriginal groups other than the Partners to allow them to make sense of the reporting results?

MS. PACHAL: We haven't contemplated it at this time, and I'm not sure if you had the opportunity to look at some of our monitoring reports for Wuskwatim, but I think they are pretty well done and self-explanatory.

MS. KEARNS: Thank you.

So I asked Ms. Cole in a previous panel about how unanticipated adverse effects on groups other than the Partner First Nations would

be dealt with, and I was directed to the JKDA. And I have had a chance to look at the clause that you referred me to, Ms. Cole.

I have a question about section 11.2.8 of the JKDA. I will just read it out, or I will wait until you put pull it up and then I will read it. 11.2.8 and it says:

"If the information obtained from ongoing monitoring subsequently discloses unanticipated adverse effects caused by the Keeyask project, then such adverse effects will be addressed by the limited partnership as set out in the KCN adverse effects agreement and in any other adverse effects agreements entered into by the limited partnership."

Do I have the wrong section?

MS. PACHAL: We are just struggling. I don't think Vicky -- I think Ms. Neville on the Partnership panel spoke to unanticipated adverse effects in relation to parties, but I don't think that Vicky did last time while this panel was up.

MS. KEARNS: Sorry, I should have clarified, not this panel. A previous panel, I'm

talking weeks back, I had asked about it, and I was referred to the JKDA as being where unanticipated adverse effects is addressed.

MS. COLE: I would have to know the context of the question that you asked me, and if that was an outright case of asking a question, because I don't recall asking that question or directing you to the JKDA.

MS. KEARNS: Okay.

So we will start again then. How will adverse effects, unanticipated adverse effects on groups other than the Partner Cree Nations be dealt with?

MS. PACHAL: In the same way the unanticipated adverse effects for the Partners will be dealt with. If an unanticipated adverse effect is discovered, we will, as a Partnership evaluate it and deal with it.

MS. KEARNS: And so the Aboriginal group would come to you with their concerns, is that what you contemplate?

MS. PACHAL: That's generally the process, yes.

MS. KEARNS: If it turns out that the predictions in the EIS materials are wrong, and

there are other Aboriginal groups that are impacted by Keeyask, will they get a seat on the monitoring advisory committee?

MS. PACHAL: That's not contemplated right now.

MS. KEARNS: Ms. Cole, in answer to one of Ms. Land's cross-examination questions on this panel, you mentioned that the impact of Keeyask on levels of Split Lake changing is an area of disagreement between the technical science and the traditional knowledge. Is that correct?

MS. COLE: Yes, we had a conversation about that being a fundamental feature actually of the project in the JKDA.

MS. KEARNS: And I didn't understand fully the explanation, and I'm hoping to get some clarification as to how that difference of opinion is being dealt with. Is it correct that the approach is to monitor Split Lake water levels and see if there are any changes, and if there are, to then engage in further discussions about what to do about those changes?

MS. COLE: Yes, that's absolutely what we would do.

MS. KEARNS: And if it does turn out

that there are changes to water levels on Split Lake, would any other groups, other than the Partner First Nations, be part of that discussion as to what to do about it?

MS. PACHAL: It is really hard to speculate without knowing the specific circumstance that you are talking about. Depending on the circumstance and the issues, we would evaluate who needs to be involved. It is almost impossible to speculate at this point who would be involved and why they would be involved.

MS. KEARNS: How far upstream will monitoring of water levels extend, to be associated with Keeyask?

MS. COLE: We do monitoring of water levels throughout our entire system. So there are already existing stations throughout our entire system that monitor water levels on an ongoing basis. So we would rely on that system, as well as new water level gauges put in place as a result of the Keeyask project.

MS. KEARNS: How will you decipher what changes are associated with Keeyask versus other projects, other aspects of the larger hydro project?

MS. COLE: We are going to have to get an undertaking for you with respect to that. It was our expectation that those sorts of technical monitoring questions would be asked of the technical panel. That is why they all presented their monitoring programs while they were up here. But if you would like, we could certainly undertake to get that information for you. I believe it was likely presented as part of the physical environment panel that was up here. And I actually think they might even have a slide that shows where the monitoring is taking place, but I'm more than happy to do an undertaking and get that information for you.

(UNDERTAKING # 18: Advise how to decipher changes associated with Keeyask versus other aspects of Hydro projects)

MS. KEARNS: Thank you.

And will that information on water levels and what can be attributed to Keeyask form part of the reporting that will be done?

MS. NORTHOVER: Yes, it definitely will be. Because if it is included in the Keeyask monitoring plans, so that would be the physical environment monitoring plan or the aquatic effects

monitoring plan, all of those results will be available.

MS. KEARNS: Just to give me a sense of what those reports will look like, will it take the larger -- as Ms. Cole just explained, like there is monitoring programs right now -- will it take the whole program and try to split out what aspects are associated with Keeyask, and report on those, or is it all aggregated?

MS. NORTHOVER: No, the reports will be on Keeyask results and Keeyask monitoring. So the monitoring that's undertaken that's not part of Keeyask will be reported on separately. For example, if it is included in the coordinated aquatic monitoring program, it will be on the CAMP website.

MS. KEARNS: So those reports, the monitoring on water levels would be the specific monitoring that's being put in place just for Keeyask?

MS. COLE: Yes.

MS. KEARNS: Okay. And the CAMP data is kept separate, is that correct?

MS. KIDD-HANTSCHER: That's correct.

MS. KEARNS: Thank you. Those are my

questions.

MS. KIDD-HANTSCHER: If I could just add, I think it might be helpful for the Commission's purposes to file a copy of the most recent Wuskwatim monitoring overview. I don't have multiple copies here, but we could arrange to have those for next Monday's proceedings. And in answer to your question, the table of contents is explicit in terms of what is included from an annual perspective in these reports.

THE CHAIRMAN: Thank you very much. Thank you, Ms. Kearns. Ms. Whelan Enns?

MS. WHELAN ENNS: I wanted to thank this panel for coming back yet again, particularly those who have to travel.

Many of the questions I identified have already been dealt with. So going to priorities here.

This is also after a time gap for all of us, but this is question that has to do with York Landing. And I want to basically ask whether you are confident in terms over time, through the lifetime of the project, whether you are confident in terms of both arrangements for the use of and your ownership of the community's intellectual

knowledge, and the knowledge then of individuals in the community?

THE CHAIRMAN: Mr. Regehr?

MR. REGEHR: I'm not sure what that question has to do with monitoring?

THE CHAIRMAN: If you could attempt to explain?

MS. WHELAN ENNS: Certainly.

And this comes from, arose at some point near slide eight. Again, we have a gap for all of us and I don't have the material in front of me, but I think it comes from Mr. Bland's very specific and helpful comments about your First Nations' knowledge and the ownership of it, and the holding of it through monitoring, through the phases over time in terms of the monitoring work that you will be doing.

MR. BLAND: It has been a while since I have been on this panel, I have forgotten -- just kidding, I thought I would throw that out there.

Yeah, when I was referring to the people of my community, I was referring to the elders, the traditional knowledge holders, you know, our youth and our resource users. So those

are people that we feel are very -- we feel confident in what they bring to us. They have different capacities. A lot of our knowledge holders and resource users are also office people, you know, they have skills in different areas. And you know, I refer to myself as one of those people because I am a resource user and knowledge holder. And I'm very confident moving forward that them as participants in MAC and other boards or other authorities, I guess, that we are moving together as partners. I'm confident in what we can deliver.

MS. WHELAN ENNS: Thank you.

Does that confidence then also include the records that will be based on the knowledge of your knowledge holders in your community over the long life of this dam, this project?

MR. BLAND: Well, it is something that we are developing right now. We have talked about traditional knowledge being something that's normally inside of us, you know, it is something that was said in our presentation that it is normally something that's not documented. But, you know, going through this process we recognize that you know this approach that we are working

on, the two-track approach and our worldviews and everything else. We are starting to document those things, and it is important for us to keep records of where things are, particularly where it comes to monitoring. Once the project is complete, how are we going to know if we don't have a baseline to start off from? So we put a bit of emphasis on how we are going to do things and, you know, what we are going to monitor and how we are going to do it.

MS. WHELAN ENNS: Thank you very much.

MS. COLE: If I could build on Ted's answer. I just wanted to note that all of the contribution agreements with the communities throughout the course of undertaking the assessment, and also the contracts to undertake the Aboriginal and traditional knowledge monitoring, all of them include a clause with respect to ownership of information, which I think may be what you are getting at. And they specifically state that all of that information is owned by the community and shared with the Partnership under specific terms, and even uses of that information and how it can be used are very clearly specified in each of the agreements.

MS. WHELAN ENNS: Thank you.

We also have the letter provided when the panel came up, and that was also a help in terms of this area of questions. Thank you.

Going by my notes then, the next question I think is for Carolyne -- and I am sorry about the pronunciation. This is about monitoring plans and also monitoring reports. And thank you for the reference again to the Wuskwatim website, I just took a look.

And that would be then what, in fact, is going to be posted publicly, I assume on the Keeyask.com website? Obviously monitoring plans will be there. But will you tell us about monitoring reports and results of monitoring?

MS. NORTHOVER: Yes. And there is going to be a difference from what you have seen on the Wuskwatim website. The Wuskwatim website has our summary document, the monitoring overview. The Keeyask website will have both the overview or the summary document that's in plain language, and it also will have the technical reports. So the plans will be there, and regular reporting. Which probably, depending on our Environment Act licence, will be on an annual basis those reports

will be required. And they will be, after they are submitted to the government they will be posted, or basically at the same time, but on the website, so that's what you will find. Any changes, or if we had to make changes to our monitoring plans or to the environmental protection plans, those will be posted as well.

MS. WHELAN ENNS: What is the time gap likely to be? Again, this is a simple timeline question. If this is annual and reports are due in October, then what is the timeline between when reports are due and handed in and when they would be public?

MS. NORTHOVER: Basically, probably one in the same, because the day we submit would be the day that we post, pretty much exactly, you know, the day.

MS. WHELAN ENNS: And the monitoring, the overarching monitoring committee, that you were helping us learn about, would have seen them before they are posted?

MS. NORTHOVER: Yes, because the monitoring advisory committee reviews the information before its been submitted to the Province or on to the Feds. So that would, yes,

the monitoring advisory committee would have seen them.

MS. WHELAN ENNS: Great. Thank you.

MS. KIDD-HANTSCHER: If I could just add, there is a distinction between the regulator reports and the monitoring overview that's produced. So that is, because it is a document of the Partnership, it follows a different cycle, it has to go through a review process. So if you are looking at a document that has results to the end of a fiscal year, we generally are able to have the board approve that document in the summertime, and then it goes out for public release after that, so then it would be posted on the Keeyask.com website simultaneously.

MS. WHELAN ENNS: Thank you.

And you are telling us then about monitoring and reports required in the regulatory process, or are you --

MS. KIDD-HANTSCHER: I'm speaking about the plain language report, and Carolyne was speaking about the regulatory reports.

MS. WHELAN ENNS: Got it. Thank you.

Around page 25 in the slides, sort of two questions that came up, and again they are not

going to be exactly on the slide, but they have to do with the monitoring programs and the summaries of them.

We took a look again at table 1.1 in the EIS, I think probably in the terrestrial volume. Again, sorry for the delay, we have all got that sort of feeling because it is Thursday afternoon.

This is a question about timelines on monitoring plans, and we have had some content and some cross-examination on it. But the chart which is a primary element in the EIS, largely identifies timelines for monitoring different VECs and different species that are -- that stop and start, that have very specific plans and intentions during the construction period. Some species there is an identification of monitoring right through a 30-year period, but not all. So there is a fair bit of stop and start.

Two weeks ago or a week and a half ago I had the chart in my hand, my apologies.

MS. NORTHOVER: We need to find that table 1.1?

MS. COLE: Are you referring to a specific table in the terrestrial or -- there is a

huge table in chapter 8 of the response to EIS guidelines which summarizes all of the monitoring plans and all of the timing?

MS. WHELAN ENNS: Thank you. Is it 1.1?

MS. COLE: No, there is H-1, H-2, H-3. There is several of them.

MS. WHELAN ENNS: My apologies, I have got no researchers this afternoon because of ill health. I did have it in hand at the time. So, you may well be ahead of me, Ms. Cole.

MS. NORTHOVER: The first one, 8-1, on physical environment, and they go numerically. If that's what you are asking about, we do have that.

MS. WHELAN ENNS: Well, if I may then in terms of the question overall, that chart triggered the question but the question overall was to do with whether there is an intent in terms of continuous monitoring, whether there is a lot of prioritizing already in terms of stop and start timelines in patterns of monitoring, and how soon there will be plans that go past the 30-year point, VECs and sub topic species?

MS. NORTHOVER: They are stop and start, we obviously are not monitoring

continuously because there is a seasonality to most monitoring, and not every VEC needs to be necessarily monitored every single year, particularly when we get to operations and we are talking about a 30-year period.

Each of the monitoring plans, we are going to have review cycle. They vary between the plans. And when each VEC is reviewed, it will be determined if we need to go longer than the 30-years. In other cases it might be shorter than that what was anticipated.

MS. WHELAN ENNS: Thank you.

Is it correct in understanding that the reviewed or updated plans will also be part of what is made public?

MS. NORTHOVER: Yes.

MS. WHELAN ENNS: Thank you.

We have had some maps in terms of monitoring areas, and also some information from the Keeyask Cree Nations in terms of their traditional areas and their RMAs.

So will each Keeyask Cree Nation be monitoring only in their RMA?

MS. SAUNDERS: As for York Factory, the community is going to determine where we will

be monitoring. It is not going to be just in our RMA, we already know that.

MS. WHELAN ENNS: Thank you.

Is there any anticipation or expectation now that there may be VECs or species that would involve monitoring by two, three, or four of the Keeyask Cree Nations?

MS. SAUNDERS: I think we stated earlier in different presentations that we don't see things through VECs, we look at things holistically.

MS. WHELAN ENNS: I take the correction, and my apologies. We get stuck in the EIS in hearing language, so that's a good correction.

May I ask slightly differently then? Is there any thought yet or planning in terms of the Keeyask Cree Nations finding that there are species habitat you are concerned about, areas in your lands that are affected by Keeyask where will you monitor together and exchange information?

MS. SAUNDERS: Can you give me a minute?

MR. NEEPIN: Can I just respond to your previous question?

What we are anticipating is that there is going to be points where our boundaries, our notional boundaries of the Partnership's respective resource management areas, as you mentioned, and traditional territories, so there is going to be that overlap from time to time.

And so obviously we agreed that there would be a collaboration amongst our respective nations. And it's absolutely necessary in order for the monitoring to be effective and efficient and that's what all of us are determined to achieve, efficiency, and for the monitoring process to be effective. Doing anything else would limit us. So there has to be that respective, respect amongst the Cree.

MS. WHELAN ENNS: Thank you. I'm comfortable with that answer at this time. And it was good to hear that. That's the hope for the lands and waters and species.

So I'm just checking with Ms. Saunders. Are we okay?

MS. SAUNDERS: Sorry, I missed George's answer, but I know that the KCNs will collaborate in monitoring.

MS. WHELAN ENNS: Thank you.

I have a couple of quick questions about the monitoring advisory committee.

There will be over time obviously new members, sub committees set up and so on, from presentations and the intentions. Has there been any discussion yet about how members will be -- stay with the monitoring committee first -- oriented and brought into the committee when they are new?

MR. BLAND: I think for the communities, you know, we are going to be starting off with people that we know, our knowledge holders, and have, you know, have different skills. And when we looked at our stewardship monitoring program, we always talk about being able to train our youth, working with Manitoba Hydro in different areas such as western science, but also our traditional knowledge. So we plan on teaching them and helping them understand what is happening. And eventually, you know, those people are going to continue what has already started.

MS. WHELAN ENNS: Thank you.

MR. BLAND: So it is just a bit of a training program.

MS. WHELAN ENNS: Thank you.

MS. KIDD-HANTSCHER: Just to add, I indicated this last week but it has been a while from a Hydro perspective, we will provide support is needed if there is changes in membership on the monitoring advisory committee throughout the life of the project, which we fully expect there will be, because it will be functional for quite some time. So we will do our part to ensure -- to be welcoming and to provide the support that's needed, to follow up on what Mr. Bland has indicated.

MS. WHELAN ENNS: Thank you.

The next question has also to do with the MAC and its sub committees.

We heard some indication, of course, that there will need sometimes to be decisions made on or near the construction site, or perhaps in relation to the dykes going up, and the road building and so on, that would need to be made on a short turnaround time, that may have to do something with species and/or a concern in terms of monitoring.

So the question is whether then, under those circumstances, the monitoring advisory committee would be informed after a decision has

to be taken, in terms of construction, or whether there would be a mechanism for an ability to contact the Keeyask Cree Nations, or sub committee of particular species concern?

This was not clear, but I think spoken to, to a degree, by the panel. So this is acknowledging that in the construction process there may be instances where the general contractor or sub contractor needs an answer, and it does have to do with something that's of importance in monitoring by both the Partnership, but also the Keeyask Cree Nations.

So is it afterwards, before, or during?

MS. NORTHOVER: I did mention in my presentation that there would be items that would need immediate attention and obviously could not wait until the next monitoring advisory committee meeting. It is Manitoba Hydro's responsibility, as the project manager, to make those changes when they are required.

So what I had said is that those changes would then be reported back to the MAC, where they are short term and they are immediately taken. It would definitely depend if there is

something that needed to be relayed to the Partners, our Partners, in a shorter time than the next monitoring advisory committee. So the situation would be very dependent on what the actual situation is.

MS. WHELAN ENNS: It could also potentially involve a sub committee, in terms of who you are letting know about the situation and the decision taken?

MS. NORTHOVER: Well, currently, we only have one sub committee, and that is the caribou committee. So if it was a caribou issue, then that committee would be let know. But right now there is no other sub committee at this time, and we haven't anticipated another sub committee being required. So that is what we have right now.

MS. WHELAN ENNS: Fair enough. General comment from me, assuming of course over time there may be other sub committees --

MS. KIDD-HANTSCHER: Well, I wouldn't necessarily characterize this as a need for a sub committee, but rather an effective line of communication between Hydro, acting on behalf of the Partnership and the communities, if those

situations arose. And that's exactly what my area of the corporation is responsible for is being that conduit. We have established communication, whether it be through the committees or day-to-day, and we would of course follow that if we had to in situations like the ones that Ms. Northover has mentioned. If immediate communication is required, we have got a process to undertake that.

MS. WHELAN ENNS: Thank you. Thank you very much, and thank you to the panel for being here yet again.

THE CHAIRMAN: Thank you, Ms. Whelan Enns. Consumers Association, Ms. Craft?

MS. CRAFT: This front table has been popular today, there are no glasses left for water. Thank you for being back, panel members. And I'm planning to have us out of here before 5:00 o'clock, and I hope you are going to join me in that effort.

There is a suggestion that we should have yes or no answers, and in that case I will design my questions in a way that I will get the answers that I want. No, I'm going to be fair and ask you complete questions, and if they are not

clear, please let me know.

My first set of questions is for Ms. Northover, and I'm going to ask you to agree with me, so I'm going to ask you yes or no questions to start. The ATK monitoring plans are currently in development, there are no drafts or final versions available; is that right?

MS. NORTHOVER: That's correct.

MS. CRAFT: And plans will be created and implemented by each of the Cree nation partners, York Factory First Nation and Fox Lake Cree Nation?

MS. NORTHOVER: I think they should probably answer that question.

MS. CRAFT: You provided testimony to that in your slides. So that's why I'm asking you that. And that monitoring is meant to address uncertainty where there are differences between predictions based on technical science and ATK; is that correct?

MS. NORTHOVER: Those are two of the reasons why monitoring will be implemented.

MS. CRAFT: And I think your testimony was that although there are two separate tracks, again this concept of two separate tracks, the

information and the recommendations from the ATK monitoring plans will be given equal weight with the technical science in the KHLP environmental protection program. And I think your words were considered equally; is that correct?

MS. NORTHOVER: I don't know exactly what my words were, but subject to check.

MS. CRAFT: Subject to check.

MS. NORTHOVER: Yes.

MS. CRAFT: Can you help me with what the process is for acknowledging and/or resolving differences between ATK and western science, as you call it technical science? Feel free to answer that in two parts. One is first of all acknowledging that there may be differences, and the second part is actually resolving difference.

MS. PACHAL: I'm not sure if you were here the last time we were up.

MS. CRAFT: I was.

MS. PACHAL: Okay. So the Concerned Fox Lake Grassroots Citizens asked us the exact same question, and we had indicated that we had -- that we have got lots of experience as a partnership of having different views on things. And we've come up with lots of -- we have a lot of

experience and lots of mechanisms to deal with disagreements. Everywhere from like one on one processes to formal arbitration, and processes within the Joint Keeyask Development Agreement. So as a partnership, as in any partnership, there is going to be disagreements and there is a lot of mechanisms, and we have a lot of experience and history as a partnership to work through those disagreements.

MS. CRAFT: Yes. And yesterday I did have the opportunity to go back through the transcript of the questions posed by the Concerned Citizens group, and I'm asking the question specifically about how, what process, and if you can name one or two or three of them, specific processes, that are going to be employed for acknowledging differences between ATK and western science, that would be appreciated.

MS. PACHAL: Again, the processes that I just mentioned; it might be one on one conversations, it might go to the MAC meeting, it might go to a board meeting, it might go to a discussion among some of the ATK specialists and the western science specialists. There is a number of mechanisms as a partnership that we

would use, and that we do use for all kinds of disagreements or different views.

MS. CRAFT: Is there anyone specifically charged with picking up on or acknowledging differences in the ATK and western science in any of the given fields?

MS. PACHAL: I think I just mentioned them all.

MS. NORTHOVER: Those results, and that information comes together at the MAC, so if it isn't sorted out at MAC, it would probably be the responsibility of the chair of the monitoring advisory committee to discuss with others as to how to sort the difference out.

MS. CRAFT: Okay. So I think what I'm understanding or hearing from you is that the MAC is going to be responsible for identifying these differences and addressing how they may be resolved; is that correct?

MS. NORTHOVER: That's correct, and that's where all of the results are discussed.

MS. CRAFT: I appreciate that answer. My next questions are for the First Nations partners. And I'm going to ask the same set of questions to each of you, I know you like to take

your turns answering and then also thinking carefully about your answers to the questions. You can choose to answer them in whatever order you would like. At what stage of development are your ATK monitoring plans currently at?

MS. ANDERSON: Okay. I answered this question at the last panel. I'm not sure if you were here, but ours is not in a draft form yet, but we have concept framework done.

MS. CRAFT: I think I understood from you at the last discussion that you were consulting with some of the elders from the community in relation to your ATK monitoring plan. So where -- at what stage of development? You met with elders. Are there any other -- is there any other information that you can tell us about where you are at in terms of developing a plan?

MS. ANDERSON: Okay. We have been -- the last time I said that we -- the core group is our main group that we worked with in the community, and they bring knowledge from the whole community. And that these are all concepts that they brought up already. They want to have teams of two knowledgeable resource users in the monitoring team, plus including youth, so there is

a transfer of knowledge. That's a core one. Also they want to be involved as construction schedule proceeds, and depending on what stage it is at, that's what they would look at also. And also they would prioritize what our experience is. Like, the more important sites that they feel should be also, you know, monitored I guess and also develop our own First Nation check list which would be more, or I guess used in parallel with the regulatory check list that's already in place. And I think one of the examples that I gave was an example when blasting is done to look at how the sediment would be going into the water.

MS. CRAFT: And that answer was really helpful last time. I'm wondering where you go from here? Is that going to be written out into the plan?

MS. ANDERSON: Yes, we plan to develop it out and flesh it out. As George also said in his opening comments, that's where we are going with our monitoring plan.

MS. CRAFT: And who is responsible for the development of that monitoring plan?

MS. ANDERSON: Our impact assessment unit.

MS. CRAFT: Thank you. Mr. Spence has had a microphone placed in front of him, so I'm guessing he has an answer.

MR. SPENCE: Good day, Mr. Chairman, panel. As we all said before it was not a difficult process in dealing were our assessing the concept of development. We have experienced it. Now we are able and we will be given the resources to do the monitoring on this next development. When we develop monitoring programs, we will be using our elders, the youth and other community members. We will have different committees, I will call CAT, MAC, and they have different members, but most importantly it will be our members that will participate at these different committees, and most importantly we respect them as members of our nation. And the opportunity that we have in these different committees is that we will be at the table with the developer, with the government, in dealing with the changes and monitoring the changes that will happen within the footprint, or how Hydro operates its current projects.

So TCN, and on behalf of War Lake, we are happy to say that we will develop our own.

And at this time we have not necessarily -- we do not have a draft to share with anyone. But conceptually we have addressed among ourselves, I guess a format, in relation to look at adaptive management. But we don't deny that there will be impacts by this project, whether it deals with specifically migratory birds, or in relation to employment opportunities. So, you know, all I'm trying to say is that we are going to develop our own MAC structure, that's the way it tailors to our concerns, and that it meets the issues of today, but we are in the immediate footprint, the immediate area of the development. But one must respect we have a voice, and that must be respected by others. We have a mind. And that must be respected by others, it always will be -- we are here by choice, by our members' decision. And by that we have a voice that we must again have a meeting of the minds by the developer. And MAC is a vehicle for the nations that will provide that voice to be heard by the developer so that we work together collaboratively, to collaborate on this development, whether with Manitoba Hydro or among ourselves as nations. Egosi.

MS. CRAFT: And just to clarify, I

think your comments were relating to MAC. And in terms of an ATK monitoring plan, Mr. Spence, I'm assuming that you are going to put an ATK monitoring plan in writing for the Cree Nation partners; is that correct?

MR. SPENCE: Yes.

MS. CRAFT: I heard you say it is going to be somewhat reflective of the nature of the monitoring committee which is a KHLP broader structure in which you will participate; is that correct?

MR. SPENCE: TCN, I will only speak for TCN at this time, even though I'm authorized to speak on behalf of the Cree Nation partners War Lake, we will develop our own ATK monitoring program. But along the way we want to do all of the monitoring program, whether it is -- well, I will just call it western science, we want to build the capacity over time that TCN, and I'm pretty sure that the other partners will want to do the same, that we develop a structure, a means, whether together to undertake all of these monitoring programs, doing ATK monitoring and the western science.

MS. CRAFT: And for TCN who is

currently responsible for developing your ATK monitoring plan?

MR. SPENCE: In relation to, we call it OWL, water and land, a group of our members that deal with all of the environmental impacts, and assessing with the members on the project. That is the same, not necessarily the same members over time, but they are the vehicle that we would like to see used in developing and implementing the RA ATK monitoring program, initiating it.

MS. CRAFT: Mr. Neepin is waving his at me.

MR. NEEPIN: I just want to clarify our response. We do look forward to the negotiations of these agreements that we are referencing right now, the monitoring advisory committee. They are not really -- they don't exist. Like we look forward, as my either earlier comments were made about how we look forward to the negotiations that are coming forward and also the completion of those promised agreements with Manitoba Hydro about community specific monitoring plans with each of the limited partnerships, or partners. Those agreements will provide the necessary funding for and the breadth of

participation by the Cree in a meaningful way with regulatory science, and in accordance with the Cree worldview and an understanding of Aski. So those are ongoing. We can't give you any documentation that would show where we are at with those. So those are things that are pending. And that as I did mention, we do look forward to discussing the agreement, the arrangement that we have with Manitoba Hydro. And also our participation will be essential in ensuring that the Partnership and Manitoba Hydro do what is needed and best for the environment. That's our commitment to this partnership. And it is through those agreements, the monitoring agreements that we will be able to achieve that.

MS. CRAFT: Is it also your understanding then, Mr. Neepin, that your ATK monitoring plans will be completed once those negotiations have been completed?

MR. NEEPIN: As I said, who better to be involved in that process than the people who know the environment best, and that's each of our communities.

MS. COLE: I wanted to add to Mr. Neepin's answer with respect to the question

that you just asked, and it is actually a really important question. As anyone who has been sitting in the room listening to us talk over the last few weeks, negotiations take a lot of time. A lot of the things that we have committed to is if we haven't reached full agreement on what the overarching framework, the ATK framework for monitoring looks like for project construction. We will still proceed with ATK monitoring on an annual basis based on annual work plans and budgets, so I don't want to leave the impression that if it takes us five years to negotiate, there is no ATK monitoring going or for the next five years during the course of the construction. The plan, and the exact same thing unfolded with Nisichawayasihk on Wuskwatim, is to implement on an annual basis while negotiations continue.

MS. CRAFT: And they will be implemented on the basis of a structure that is chosen by the partners, I assume?

MS. COLE: Yes.

MS. CRAFT: Mr. Bland, Ms. Spence, same question; in what stage of development is your ATK monitoring plan?

MS. SAUNDERS: It is Ms. Saunders, not

Ms. Spence.

MS. CRAFT: I am sorry.

MS. SAUNDERS: York Factory has a preliminary draft. Monitoring isn't knew to us. Maybe the word monitoring is new to us, but then we have been monitoring I guess since for as long as we can remember. Just being a part of this process, the structure is new. And we have had meetings with our community members, our members, and we talked about the things that are important to us and how we see this project affecting us, and we've come up with a preliminary draft. While the details are being worked out, the commitment of the partners is clear, and I will let my colleague Ted tell you the name of our stewardship plan.

MR. BLAND: So, Aski Keskentamowin, that means to watch out for and take care of the lands, waters, wildlife and plants and people of the land.

MS. CRAFT: Thank you. Would I be correct in saying that a copy of that draft is not available to anyone other than the York Factory First Nation currently?

MR. BLAND: It is still in the

developmental stages, and we are still meeting with our members to try and finalize it. So it is going to be a little while yet.

MS. CRAFT: Thank you. And this question might go to Ms. Cole in follow up to her earlier response. Is there currently any funding in place for monitoring plans and implementation of monitoring plans at the current date, and going forward until the negotiations that we spoke of a few minutes ago are complete?

MS. COLE: Yes, there is, and that commitment to funding is actually provided in the letter that we filed.

MS. CRAFT: I notice there is no amount, specific amount in the letter. Is there any further detail that you can give us about any levels of funding for implementation of monitoring?

MS. COLE: No.

MS. CRAFT: And have future amounts related to monitoring been confirmed or is that again subject to the negotiations that were spoken of?

MS. KIDD-HANTSCHER: Subject to negotiations.

MS. CRAFT: Thank you. The letter that you are referring to, I'm assuming that you probably have copies with you, but we have some to distribute to anyone who might be needing a copy. I will ask my articling student Joelle to hand those out.

I'm going to refer specifically to paragraph 3, and in all fairness to Ms. Pachal, since this is your letter, if you want to read out paragraph 3 for us, that would be helpful.

MS. PACHAL: It is acknowledged that it will be beneficial to all parties if the Keeyask Cree Nations and their respective elders and other KCN knowledge holders are able to collaborate with one another, sharing their methods, observations and findings of their respective monitoring programs, and making joint reports and recommendations based upon the information derived therefrom. We agree that in addition to participating with and providing reasonable funding to each Keeyask Cree Nation with respect to their respective monitoring programs, we will participate in and reasonably fund each KCNs participation in a process to develop a mechanism satisfactory to all KCNs, by

which they can collaborate on monitoring and resolve conflicts and disputes that may arise with respect to such programs, and also to fund the processes continued operation.

MS. CRAFT: Thank you. And my question is for the First Nation partners and the Cree Nation partners. Is there currently a process in place for sharing methods, observations and findings between your First Nations and communities regarding ATK matters? If so, what is that process?

MR. BLAND: I talked a little bit about this last week. Usually the process is people that are on the land, people that are using the resources, knowledge holders, elders, they come to people in the future development office or the chief and council. And information is sometimes brought up in meetings, and if the people find that there is -- if the people find that there is some unusual occurrences or whatever, then they will bring it up.

MS. CRAFT: I'm going to stop you there. I may not have asked the question fully. You did answer that the other day about York Factory's process. I'm speaking about between the

different communities, so for members of York Factory or the leadership of York Factory to be speaking to Tataskweyak, for example. Is there a process in place currently for sharing the methods, observations, findings between the various First Nations or Cree Nations as you refer to yourselves?

MR. BLAND: Well, I think a lot of times -- did you want to answer it? A lot of times the communities will sit down together and then talk about, you know, we have been negotiating with each other and with Manitoba Hydro for a long time, so we kind of know what is happening in our territory. And we always have a chance or an opportunity to sit down and discuss, you know, if there is any problems or unusual occurrences or anything like that. I can talk to Victor and Karen and, you know, anybody from Fox Lake to discuss if I have any concerns, and the feeling I would believe is mutual that they would do the same with us, you know, from Tataskweyak as well.

MS. CRAFT: So I think the process that you described as a discussion, is that a telephone call or --

MR. BLAND: It is a telephone call, and it could end up as a formality, depending on how serious -- if there is an issue, then letters or correspondence will be going back and forth.

MS. CRAFT: Is there anything that Mr. Spence or Mr. Neepin or Ms. Anderson want to add to that? You are generally in agreement that that's the process employed between your nations?

MR. SPENCE: Good day. TCN. I don't know what you mean by structured.

MS. CRAFT: I can ask the question again. I'm just wondering what your process is currently in place for sharing, and the letter talks about methods, observations and findings between the nations. So I'm just interested in how you actually do that?

MR. SPENCE: Well, we had like different committees within the nations, whether it is Cross Lake, Nelson House, under the Northern Flood Agreement to deal with respective to sturgeon, the sturgeon board. And respectively among ourselves there is not necessarily a government process how we speak with one another, how we deliberate on concerns that arise from development. We do speak with one another, and

our chief and council also meet to deliberate on matters of development, not necessarily just with Hydro, but other forms of development and concerns that arise that could affect us as a nation.

MR. NEEPIN: Okay. As I said before, collaboration amongst our respective nations is absolutely necessary in order for the monitoring to be effective and efficient. And that's a common goal for all of us, it has got to be efficiency and it has to be effectiveness, because our people will hold us accountable for that. We have to make sure that these agreements that I mentioned, we are looking forward to those agreements and those discussions to be able to outline just exactly what our responsibilities are going to be in the monitoring process. So it is not -- that's not an item or an issue that we would be obviously taking lightly. Those are very important. That gauges -- that has a huge impact to our communities, and they are going to be looking forward to making sure that we have effective monitoring advisory processes in place.

There was something else here I wanted to mention, and I know -- the Hydro recently, and I just sent a reminder to my colleagues on the

panel is that our elders have spent considerable amount of time together talking about caribou, because caribou, as you have heard previously, will be impacted significantly in this process, like any other development affects the wildlife and animals. And as partners we take that as a responsibility to make sure that those very issues are discussed. So our elders have been coming together. They have also been coming together to talk about the sturgeon. They have been coming together to talk about the effects that tributaries will have, spawning areas, so it is important that all of us, because we have traditional territories, you know, the resource management area is very specific like, for instance, Keeyask, that's TCN's RMA, but we have traditional use and that's why we are up here as four partners.

MS. CRAFT: And, Mr. Neepin, you would be aware that the paragraph that was just read out talks about collaboration. And in particular it says in the fourth line, it contemplates making joint reports and recommendations based on information that's derived. Has it been the experience of Fox Lake in the past to make joint

reports and recommendations with the other Cree Nations, the Keeyask Cree Nation partners?

MR. NEEPIN: Well, we are a partner, I mean those are all subject to the agreements and discussions that we are going to have with each other. As I said, the agreements will obviously give capacity to each of our nations to be effective in that monitoring. Yeah, I'm not really sure what you are driving at in terms of, I know I'm going to go to the table with the full understanding what my elders and what my community requires in order for them to be effective, right? This is what this is all about, we have to be effective. I'm not going to be going into any kind of discussion that would leave me halfway or to do a partial job in monitoring, and that my community will hold me accountable to that.

MR. BLAND: I just wanted to add as well, that over the past several years York Factory and Tataskweyak, Fox Lake and War Lake, we have been working together a lot, going through negotiations a lot. There was a lot of collaboration on a lot of different things while we were negotiating JKDA, now more recently we did a stewardship agreement, and we are working on

caribou, another agreement. So it is not nothing new for us to work together and to do joint submissions. We have been doing it for a long time.

MS. PACHAL: I just want to point out that this letter documents a negotiation between Manitoba Hydro and the partners. So we worked with the partners to determine how we wanted to approach the monitoring. And this letter documents some of those agreements. And it was at the request of the Cree that this -- that funding be provided for them to work together. So I just want to make it clear that this isn't something that Hydro dreamed up and is imposing on the Cree or suggested to the Cree. This is something that the Cree suggested and that the Cree want.

MS. CRAFT: And the letter that you are referencing, Ms. Pachal, your letter, also talks about developing a mechanism that is satisfactory to all of the Cree Nations to resolve conflicts and disputes, and could I just get a confirmation as to whether or not this dispute resolution mechanism has been established, or if it is part of ongoing negotiations and not yet confirmed?

MS. PACHAL: Not yet decided.

MS. SAUNDERS: Can I add to the question you asked? I didn't get a chance to respond because everybody else was responding. But you asked if there was a current process in place. Ted spoke to, like, we have been in negotiations for some time now, and we've held numerous workshops and meetings and gatherings like with the KCN and Manitoba Hydro. We were able to resolve whatever differences we have and acknowledge that we have been working together for a long time, but currently what is in place is the PRLC, it is the partners regulatory licensing committee, that's where we go, what ever can't be resolved at these -- like where we are meeting, we usually take it to the PRLC and it gets dealt with there. And there is different reps on the PRLC for different areas of the partners.

MS. PACHAL: And the partners regulatory licensing committee is chaired by myself and Mr. Victor Spence. We co-chair that committee.

MS. CRAFT: I'm going to move on from this subject, but I just want to confirm it is still the intention of each of your nations to

develop and provide your own individual ATK monitoring plans; is that correct?

MR. NEEPIN: Yes.

MR. BLAND: Yes.

MR. SPENCE: Yes.

MS. CRAFT: Okay, thank you. Turning to the monitoring advisory committee now, and this question I will direct to Ms. Northover. How many members from each of the partner communities will be on the monitoring advisory committee?

MS. NORTHOVER: That was in my presentation and also included in the terms of reference which are for the monitoring advisory committee, which are part of the JKDA. So there is going to be five Manitoba Hydro members and two members from TCN, one from York and one from Fox and one from War Lake, plus there are four technical advisors that provide support to the First Nations partners.

MS. CRAFT: I apologize, I didn't see the numbers in your presentation. If you did provide them, I apologize for my question again.

MS. NORTHOVER: I spoke of them.

MS. CRAFT: And MAC is an advisory committee to the Partnership board of directors,

is that correct?

MS. NORTHOVER: That's correct.

MS. CRAFT: And the Partnership board of directors is not necessarily bound to accept the decision of the MAC; is that correct?

MS. KIDD-HANTSCHER: That would be correct.

MS. CRAFT: And am I correct in suggesting that a determination of whether to accept or reject the advice of the MAC may require a vote of the Partnership board?

MS. KIDD-HANTSCHER: Yes.

MS. CRAFT: In terms of voting rights with regard to the partnership board, out of 100 votes, Hydro will be entitled to 74 votes, the general partner would be entitled to one, and the KCNs have a maximum of 25 votes on the board; is that correct?

MS. KIDD-HANTSCHER: This actually came up earlier in the hearing, and I don't have the exact article in front of me, but those votes that you are referring to are the partners' votes so those would be in annual partnership meetings as opposed to board meetings of the general partner. The general partner is a small group of

individuals, five representatives from the communities and then representatives from Hydro. So just clarifying that what you are reading is with respect to the limited partnership meetings and that's not the same as the general partner board meetings.

MS. CRAFT: I appreciate that. But my earlier question is on accepting or rejecting the advice of the MAC, the Partnership board may be required to vote?

MS. KIDD-HANTSCHER: The board of the general partner would be required to vote, but the number of votes that you just indicated are not for the board, those are for annual partnership meetings where the partners themselves would be represented, which would be Hydro and the KCN investment entities as partners.

MS. CRAFT: So if the board is required to vote on -- to accept or reject advice of MAC, who is voting?

MS. KIDD-HANTSCHER: The directors of the board which would be Hydro representatives, as well as the five representatives from the communities.

MS. CRAFT: Are you speaking of the

MAC?

MS. KIDD-HANTSCHER: No, the board incidentally has the same number of KCNs representatives as the MAC does, so that five is the number of representatives on the general partner board for the KCN communities as well.

MS. CRAFT: So, I apologize for this, it is confusing, the Partnership board consists of --

MS. KIDD-HANTSCHER: I think you are trying to get at the fact that the board is majority control by Manitoba Hydro is that what --

MS. CRAFT: I'm just interested in who is making decisions.

MS. KIDD-HANTSCHER: So the board is making decisions -- from a structure perspective if MAC has a recommendation or a concern that needs to go to the board of the general partner, that's where it would flow as per the terms of reference and the governance structure. The board would be comprised of Hydro representatives and representatives of the Keeyask Cree Nations, and there are more Hydro representatives on that board than there are Keeyask Cree Nation representatives, and the responses we provided in

IRs would have indicated that.

MS. CRAFT: Okay. So if there is a disagreement amongst the members of the MAC with proposed adjustments to monitoring, they are raising concerns with the board of the general partner; is that correct?

MS. KIDD-HANTSCHER: Yes.

MS. CRAFT: And the general partner is owned by Manitoba Hydro?

MS. KIDD-HANTSCHER: Is a wholly-owned Manitoba Hydro subsidiary, yes.

MS. CRAFT: And now not the general partner's board, but the partner's board in relation to MAC is charged with the responsibility to reassess honorary and reasonable expenses of MAC representatives; is that correct?

MS. KIDD-HANTSCHER: Yes, and maybe where the confusion is, there is only one board, and it is the general partner board running the business on behalf of the KHLP.

MS. CRAFT: I'm going to ask that Ms. Pastora Sala to distribute some information requests.

THE CHAIRMAN: Ms. Mayor?

MS. MAYOR: I'm not sure if these IRs

are still relating to the same topic area in terms of the governance structure. But this is not the governance structure panel, that was the very first partnership panel that appeared weeks and weeks ago. So I'm not sure if we are moving on to another area, but I have a concern that we are going back through an entirely different panel as opposed to focusing on this one.

THE CHAIRMAN: I think it was months, if not years ago.

MS. CRAFT: And I appreciate --

THE CHAIRMAN: I think she is correct. If you are asking about governance structure, then this is not the panel. This panel is on monitoring and moving forward.

MS. CRAFT: Absolutely, and my questions relate directly to the advice of the monitoring advisory committee, and who will be responsible for making decisions based on the advice or questions that are raised by the monitoring advisory committee.

THE CHAIRMAN: I think it has been canvassed fairly well.

MS. MAYOR: Before, when they appeared, and as well several times now by her,

and I'm concerned that we are going over and over topics that have already been covered. We have made the point, I think we need to move on.

THE CHAIRMAN: I would agree with Ms. Mayor, I think the point has been made. It has been covered many times, including today.

MS. CRAFT: Then I would ask the panel to just consider that in the IRs that have been distributed, there is reference to the partnership board of directors and the general partners both as being decision makers in relation to the monitoring advisory committee, and I will leave it at that. Thank you very much, Mr. Chair.

THE CHAIRMAN: Sorry, Ms. Craft, if you keep it narrow to that question, that would be allowed, if you are going to go broadly again on -- the point you just made, one of my panel members was also talking in my ear, so you made the point about two different boards; is that what you are saying?

MS. CRAFT: That's correct.

THE CHAIRMAN: I think it is legitimate to ask or clarify that question.

MS. KIDD-HANTSCHER: I think I can hopefully easily correct this, we just used

different terminology in these two responses. There is only one board of directors for the Partnership. So we just referred to it as the Partnership board of directors in 63C, and the board of the general partner in 164; they are one in the same.

THE CHAIRMAN: Does that answer your concern?

MS. CRAFT: It does. Thank you very much.

THE CHAIRMAN: Thank you, Ms. Craft. Panel members? Mr. Yee.

MR. YEE: Thank you, Mr. Chair. I have a question on your slide 31 regarding the MAC. And I don't know who to direct it to, but essentially I'm looking at the last two bullets, and I will do them in reverse here. First of all, it is stated that the purpose is to provide oversight of the environmental protection program. And we don't need to go back to that slide, it is pretty extensive. There is a lot of protection programs period, and a lot of monitoring associated with that. So I guess my question really goes back to that in terms of changes to the program or being able to oversee these

extensive programs and monitoring. My question is really if the MAC only meets every two months, is that going to be sufficient for the MAC to respond to issues that arise out of the environmental monitoring programs?

MS. NORTHOVER: We currently believe it is, but if there was reason to determine that more frequent meetings were required, that we would make an alteration. But based on the past experience with the Wuskwatim project, bimonthly meetings were satisfactory.

MR. YEE: I guess just to follow up then, this is again mentioned during construction, would that frequency of meetings change for operation?

MS. NORTHOVER: It is likely it would be reduced during operation. But we will determine that many years down the road.

MR. YEE: Thank you very much.

THE CHAIRMAN: Just following on that line of questioning, and this may have been answered somewhere, but my memory, heck a week ago is a long time ago. Are there going to be on site environmental monitors during construction who represent the KCNs,or the Partnership?

MS. NORTHOVER: There will be an environmental officer and inspectors on site, they will be Manitoba Hydro employees that will monitor the conformance and compliance with the environmental protection plans, and that information will be part of the monitoring advisory committee, or will come back to the monitoring advisory committee. The environmental monitor term is not used for the Keeyask project. I believe that term came up in the Bipole III project. We have IR responses on that saying -- explaining the differences. So the KCN members will be conducting their ATK programs and will be on site as part of that, which is different than the environmental monitors described for Bipole III.

THE CHAIRMAN: Thank you. You said this is addressed in some IR responses?

MS. NORTHOVER: Just a minute.

MS. COLE: It is CEC round two, so CAC168, the exact question is asked, and Carolyne has pretty much paraphrased the answer for you. But if you want to read it, it is in that IR as well. CAC168 from the second round of the IR process.

THE CHAIRMAN: Mr. Neepin.

MR. NEEPIN: Yes, I just wanted to go on record that Fox Lake is in fact of that opinion as well, that we would like to have that ability or capacity to have a monitoring on site.

THE CHAIRMAN: Thank you. So, will there be representatives of the KCNs on site as environmental monitors?

MS. PACHAL: That hasn't been decided at this point.

THE CHAIRMAN: Okay. Thank you. Any other business? I think we are finally finished with you folks. I think we have some documents to register before we leave for the day, the week.

MS. JOHNSON: Yes, we did do. And one that I overlooked yesterday was Pimicikamak's original submission from October 7th which will be PIM01. There is two videos from yesterday, the youth video will be PIM005, and Mr. Settee's video will be 006. Dr. Luttermann's report will be 007. Her presentation will be 008.

And KHLP085 will be the management plan for the northern leopard frog. 86 is the ICUN red list, and 87 is the state of Lake Winnipeg report. 88 is the excerpt from the Split

Lake joint study. And CAC number 30 is the ESA article on the role of riparian corridors.

(EXHIBIT PIM001: Pimicikamak's original submission from October 7th)

(EXHIBIT PIM005: Youth video)

(EXHIBIT PIM006: Mr. Settee's video)

(EXHIBIT PIM007: Dr. Luttermann's report)

(EXHIBIT PIM008: Dr. Luttermann's presentation)

(EXHIBIT KHLP085: The management plan for the northern leopard frog)

(EXHIBIT KHLP086: The ICUN red list)

(EXHIBIT KHLP087: The state of Lake Winnipeg report)

(EXHIBIT KHLP088: The excerpt from the Split Lake joint study)

(EXHIBIT CAC 30: The ESA article on the role of riparian corridors)

THE CHAIRMAN: Thank you. I think that when I tell you next week we will be in the Provencher room downstairs, I think I will be correct. So Monday morning, 9:30, downstairs in the Provencher room. I believe it is Fox Lake on Monday, is it not? Good. Mr. London.

MR. LONDON: I would like to say again, if anyone wants to get a head start on the Provencher room on Monday, they can go downstairs right now, and those of you who are not in a conflict of interest are welcome to come, and I particularly want to invite the Concerned Citizens of Fox Lake to join us downstairs.

THE CHAIRMAN: I just hope when we come in Monday morning there is no people left over from your party this evening.

MR. LONDON: Only me.

THE CHAIRMAN: Enjoy your weekend.

(Adjourned at 4:50 p.m.)

OFFICIAL EXAMINER'S CERTIFICATE

Cecelia Reid and Debra Kot, duly appointed Official Examiners in the Province of Manitoba, do hereby certify the foregoing pages are a true and correct transcript of my Stenotype notes as taken by us at the time and place hereinbefore stated to the best of our skill and ability.

Cecelia Reid

Official Examiner, Q.B.

Debra Kot

Official Examiner Q.B.