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APPEARANCES

CLEAN ENVIRONMENT COMMISSION
Terry Sargeant - Chairman
Edwin Yee - Member
Judy Bradley - Member
Jim Shaw - Member
Reg Nepinak - Member
Michael Green - Counsel to the Board
Cathy Johnson - Commission Secretary

MANITOBA CONSERVATION AND WATER STEWARDSHIP
Elise Dagdick
Bruce Webb

KEEYASK HYRDOPOWER LIMITED PARTNERSHIP
Doug Bedford - Counsel
Janet Mayor - Counsel
Sheryl Rosenberg - Counsel
Bob Roderick - Counsel
Jack London - Counsel
Vicky Cole
Shawna Pachal
Ken Adams
Chief Walter Spence
Chief Louisa Constant
Chief Betsy Kennedy
Chief Michael Garson

CONSUMERS ASSOCIATION OF CANADA
Byron Williams - Counsel
Gloria DeSorcy
Aimee Craft

MANITOBA METIS FEDERATION
Jason Madden - Counsel
Jessica Saunders

MANITOBA WILDLANDS
Gaile Whelan Enns
Annie Eastwood

PEGUIS FIRST NATION
Cathy Guirguis - Counsel
Lloyd Stevenson
Jared Whelan

CONCERNED FOX LAKE GRASSROOTS CITIZENS

Agnieszka Pawlowska-Mainville
Dr. Kulchyski
Noah Massan

PIMICIKAMAK OKIMAWIN
Stephanie Kearns - Counsel
Kate Kempton - Counsel
Darwin Paupanakis

KAWEECHIWASIHK KAY-TAY-A-TI-SUK
Roy Beardy

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Wednesday, October 23, 2013

Upon commencing at 9:35 a.m.

THE CHAIRMAN: We'll come to order now. I apologize for the slight delay in getting going this morning, but we had an issue that needed a little bit of discussion between the panel, or the Commission and the Partnership. It relates to the first item on the agenda this morning, and that is the introduction to the collaborative Two-track approach. And as you will note in bold letters, it says that this is introductory or information only and no questions. And there was concern raised by a number of people about the no questions part of this.

Just let me explain how this came to be and how it will unfold. There will be no cross-examination at the end of this session. We view it as an introductory session only, an introductory to a number of other panels which will be arising over the next number of weeks. If we did it individually, an introductory session individually at each of those panels, we would not have cross-examination at the end of the introduction and before we get into the meat of the presentation.

So that's how we will treat this. This is introduction. Presumably it will set the stage for a number of other panels that the partnership will be putting on the stand over the next number of weeks. You will have an opportunity during those panel presentations to cross-examine on any of the issues related to those panels, and issues that arise out of today's introduction.

The individuals who are on this panel, at least two of them will definitely be scheduled on future panels. The third one, if need be, will be brought back available for cross-examination at a future date.

So having said that, I will turn it over to Ms. Pachal to introduce her panel and make the presentation.

MS. PACHAL: Thank you, Mr. Chair and Commissioners. Good morning to the Elders, and any Chief and Councillors, youth, ladies and gentlemen. It's a real privilege, actually it's one of the highlights of my career to sit up here this morning and share a panel with Mr. Joe Keeper. He's a bit of a legend in this area of the world. He's a respected Elder and an adviser

to Tataskweyak Cree Nation, and he'll tell you more about himself through his presentation. And as well, I get to work with Vicky every day so it's a highlight of my career everyday to work with Vicky Cole, who is the manager of the major projects and assessment licensing department in the power projects development division.

I'd like to start, Mr. Chair, if it's okay, responding to two of the undertakings we took yesterday.

THE CHAIRMAN: Yes.

MS. PACHAL: One of the undertakings was for me to Mr. Williams, requesting us to file the IHA assessment. And we're happy to file the draft of the IHA audit or assessment that's currently out for review. We'll ensure that each panel is prepared to talk about the findings and the audit related to their topics of the panels. Since we didn't undertake the audit, we can only speak to our perspectives on their findings and our perspectives and experience as participants. We won't be able to speak specifically about their own process. So just to clarify that.

And another undertaking was for myself to Mr. Madden yesterday asking, did the IHA

auditors meet with the MMF? No, the IHA auditors did not meet with the MMF.

THE CHAIRMAN: Thank you.

MS. PACHAL: I'd like to take the opportunity to introduce the environmental assessment to you this morning of the Keeyask Generation Project. As stated in the preface to the Environmental Impact Statement, the partners agreed early on that there would be two assessment processes for the project; a Keeyask Cree Nation's environmental evaluation process based on the Cree worldview, as well as a government regulatory environmental assessment process based on the guidelines issued by the regulators.

Over the course of the next several panels, you will hear about the partnership's Two-track environmental assessment approach. We will provide a detailed description of the project and a discussion of the regulatory environmental assessment. You will then hear directly from the Cree about their own environmental evaluation processes.

Finally, we will conclude by presenting how we will work together as partners on environmental matters throughout the project.

But before we move on, I'd like to take this opportunity on behalf of the Partners to provide a simple overview to guide you through the Environmental Impact Statement submission itself, since it physically encompasses quite a lot of material.

The Environmental Impact Statement is contained within three main bound binders, and that includes the executive summary, the Keeyask Our Story video which we watched yesterday, the response to the EIS guidelines, along with a map folio, and the Keeyask Cree Nations environmental evaluation reports.

There are also technical supporting volumes to the EIS submission contained in 10 green binders: The project description, which is one binder, the public involvement, which is one binder, the physical environment in two binders, the aquatic environment in three binders, the terrestrial environment in two binders, and finally in one binder the socio-economic environment resource use and heritage resources.

Beyond the original submission, additional information has been provided through responses to the information requests through the

technical advisory committee process and the Clean Environment Commission's processes, as well as supplementary filings, including the filing of the Partnership's preliminary environmental protection program. All of these documents are also available on the Partnership's website at www.keeyask.com.

I would now like to turn it over to Mr. Keeper to continue with our presentation.

MR. KEEPER: Thank you. Commissioner, Chairman, Commissioners, ladies and gentlemen, good morning. Tanisi.

My name is Joe Keeper, as you have heard. I welcome this opportunity to speak on the development of the Two-track approach to the environmental assessment processes that are an important part of the Keeyask project Environmental Impact Statement. I have also been asked to introduce myself to you, which I'll do as modestly as possible.

I have seen a great deal of change in the way of life of my people, the Cree, during my lifetime. I was born at Norway House in 1928. I grew up at Norway House with my family until I completed grade seven in 1941. And then I went to

the Indian residential school in Portage la Prairie, where I graduated from high school in 1946. Much later I earned a Bachelor of Arts degree in Native Studies at the University of Manitoba.

I worked with the Tataskweyak Cree Nation and the Cree Nation Partners, that's TCN and the War Lake First Nation, for the past 22 years as a consultant and as an advisor, drawing on experiences over the years that included work as a minor in Flin Flon, an artillery surveyor in Korea with the Canadian Armed Special Force, field engineer with the Royal Canadian Engineers in Europe, and later a surveyor in Northern Manitoba. I have worked in community development for the Province of Manitoba and with the Native Citizens Division of the Citizenship Branch with the Government of Canada.

My most relevant experience, however, perhaps has been my work on the Northern Flood Committee in various capacities from 1975 to 1990. I also lived and worked with the Chemawawin Cree Nation as a community development worker with the Manitoba Government. I spent three years living in the Chemawawin community, from 1962 to 1965,

when the Grand Rapids Generating Station was being built, and Cedar Lake and the Summerberry Delta were being turned into the Grand Rapids Forebay. And the Chemawawin Cree were relocated from their homes at Chemawawin across the lake to their present location at Easterville.

You may have concluded, therefore, that I have lived a long life. I have. I am now 85 years old and I have 12 grandchildren and two great grandchildren. I'm still thinking about the future for them and my Cree brothers and sisters. That is why I am here today.

The purpose of my presentation is to place the negotiation of the Joint Keeyask Development Agreement, the JKDA, and the Environmental Impact Statement into the story of the Keeyask Cree Nation's ongoing struggle to save and preserve their independence and way of life as Cree First Nations in their ancestral homeland. The Cree have always recognized that their survival as Cree is rooted in their relationship to the land and water and all of nature. The Cree could call this their relationship to Aski.

The Cree have lived in the lower Nelson region of the proposed Keeyask project for

thousands of years. For perspective, there is an archeological site found on Split Lake that shows that the Cree were already living on Split Lake approximately 5,000 years ago, we say since time immemorial, how it is expressed, it's a long time. Many Cree will say they have been here forever.

Over the past 125 years, from the period prior to the signing of the Treaty number 5 in 1908 to the present, a major concern of the Cree has been the impact of destructive change from outside on their land, lives and livelihood. This continues to be a major concern, particularly the impact of northern hydroelectric development. There have been many changes in the (Cree spoken) way of life since the appearance of non aboriginals into their ancestral homeland. The first was a fur trade. And within the last century, the building of the railway through the heart of their ancestral homeland. There has been mining, forestry, and commercial fishing, but none of these has the overall and drastic impact upon the totality of the land, culture and traditional livelihood of the Cree, as the all-encompassing impacts of the northern hydroelectric development.

In 1908 and 1910, additions to Treaty

number 5 were negotiated by the leaders of Tataskweyak and York Factory because they recognized the need to make a Treaty with the Government of Canada, to safeguard their way of life in their ancestral homeland. At that time, neither War Lake nor Fox Lake were considered separate Cree communities by the Government of Canada, but they were nevertheless covered by the adhesions. The Fox Lake Cree were considered to be York Factory Cree. The War Lake Cree were considered Tataskweyak Cree.

Later in 1947, the Fox Lake Cree and the Shamattawa Cree each acquired separate band status under the Indian Act. The War Lake Cree acquired separate band status in 1981.

The Government of Canada asserted that it owned and controlled the lands and the natural resources of the Treaty territory. This understanding is always, and continues to be disputed by the Cree who intended only to share the land with the newcomers.

In 1930, the Provincial Government gained control of the Crown lands and the natural resources with the Natural Resources Transfer Agreement. The Natural Resources Transfer

Agreement was passed by Canada without consultation and the knowledge of the Indian people of Manitoba, including the Cree who had signed adhesions to Treaty number 5. The powers that the Natural Resources Transfer Agreement gave to the Province, and the implications of these powers for the Cree began to surface with the imposition of provincial game laws and the imposition of the registered trapline system upon all trappers in the traditional resource area, including First Nation trappers. This was done with the active assistance of the Indian Affairs Branch.

Beginning in the late 1950s, the most significant change for the Cree in the north was the development of the hydroelectric projects in Northern Manitoba, without proper consultation with, nor permission from, the First Nations impacted.

The Government of Manitoba and Manitoba Hydro, with the cooperation of Canada, moved ahead with their plans for hydro development in the north. It was not until the Northern Flood Committee was formed in 1970s by the Tataskweyak Cree Nation, the York Factory First Nation, and

three other First Nations, the Norway House Cree Nation, the Cross Lake Cree Nation, and the Nelson House Cree Nation, that the northern Cree took a position opposing the hydroelectric projects. They formed their own organization to negotiate the Northern Flood Agreement, which was signed in December 1977.

Once the five Northern Flood Committee First Nations began to negotiate the Northern Flood Agreement, it soon became apparent that as far as Manitoba and the Manitoba Hydro were concerned, they were not prepared to recognize that the Cree had any rights to the land and resources outside their reserve boundaries, apart from their special Treaty rights for hunting and fishing for food. And I believe this continues to be the position to this day.

The Fox Lake Cree Nation was not a member of the Northern Flood Committee in the negotiation of the Northern Flood Agreement, and was not a signatory to the Northern Flood Agreement when it was signed in December 1977 and was ratified by each of the five Northern Flood Committee First Nations in March 1978. The War Lake First Nation at that time had not yet

acquired a separate First Nation status.

Kelsey was the first hydroelectric project that directly impacted the Keeyask Cree Nation communities. The arrangements for the Kelsey Generation Station were made without any involvement or communication with any First Nation. There was no official involvement of Canada, only Manitoba, Manitoba Hydro, and it's called Manitoba Hydro Electric Board at that time, and the International Nickel Company negotiated and were parties to the Kelsey agreement. It was as if the Cree did not exist.

Kelsey was completed by 1960 and began providing power to Thompson and the INCO operation.

None of the Keeyask communities have ever received any benefits for the many millions of dollars from the hydroelectric power that has been produced at Kelsey, and the millions of dollars that have been produced by the INCO operation in Thompson. Kelsey was developed specifically for the Thompson operation and is located 25 miles up river from the reserve community of Tataskweyak.

The York Factory First Nation

community is located downstream from Kelsey on the south shore of Split Lake. Each of the KCN, or the Keeyask Cree Nation communities, have documented their specific histories in relation to the hydro development on the lower Nelson in their respective environmental evaluation reports.

Concern over the massive hydroelectric development on the lower Nelson River below Split Lake, and the Lake Winnipeg Regulation and the Churchill River Diversion, and its potential impact upon the land, lives and livelihood of the northern Cree, caused Tataskweyak, York Factory, Norway House, Cross Lake, Nelson House to form the Northern Flood Committee, to try to prevent the destruction of their land and way of life.

Split Lake became the site where all waters flowing from the Churchill River Diversion joined with the water from the Lake Winnipeg Regulation to provide the flows required to power the huge existing and proposed dams on the lower Nelson River below Split Lake. The Northern Flood Committee was able to get the two senior governments and Manitoba Hydro to come to the table to begin negotiations concerning the impacts of hydroelectric projects to their land, lives and

livelihood. The Northern Flood Committee had no financial resources, but they were able to get the support of their membership, and eventually limited financial support from Canada in the form of guarantees for bank loans.

The negotiations resulted in the signing of the Northern Flood Agreement in December 1977 by Canada, Manitoba, Manitoba Hydro, and the Northern Flood Committee representing the five First Nations which had incorporated the Northern Flood Committee to act on their behalf and the negotiation of the Northern Flood Agreement.

The Northern Flood Agreement contained many promises for action, but the wording of the Northern Flood Agreement about -- the wording of the Northern Flood Agreement allowed for different interpretations to be made by each of the parties. The Northern Flood Agreement contained promises to address the loss of land in the form of land exchange and special land use, the maintenance of their traditional trapping, fishing and hunting rights, preferential education, training and employment opportunities, remedial works for damage to community infrastructure, and shoreline

clearing along navigable waterways. However, there were no specific action plans developed.

The Northern Flood Agreement article for arbitration, which allowed any dispute among the parties to be arbitrated, eventually became the only way that the Northern Flood Agreement was being implemented. But it also allowed the parties to delay or avoid implementation by letting every dispute or claim go to the arbitrator.

Arbitration became a long, tedious and difficult process.

The Northern Flood Agreement, however, despite its imperfections, has served to provide a legally binding contract as the basis for the negotiation of specific action plans for the fulfillment of the obligations contained in the Northern Flood Agreement. The Northern Flood Agreement arbitration clause provided a legal forum before the arbitrator to deal with the claims by the five Northern Flood Agreement First Nations, and these became part of the record.

Eventually, leaders of the five NFA First Nations proposed a plan whereby the two senior governments and Manitoba Hydro could fulfil

their outstanding obligations and settle the outstanding arbitration claims through a Northern Flood Agreement implementation agreement. While the Northern Flood Committee as an entity never did sign a Northern Flood Agreement implementation agreement, the negotiations provided a basis for four of the five First Nations to each sign their own individual implementation agreements, beginning with Tataskweyak in 1992, and the York Factory First Nation in 1995.

Separate from the Northern Flood Agreement, both the Fox Lake Cree Nation and the War Lake First Nation have each signed their own individual settlement agreements with Manitoba Hydro, Fox Lake in 2004 and War Lake in 2005. These activities and negotiations regarding the Northern Flood Agreement and other settlement agreements thus provided a basis for ensuring that further developments of Hydro related projects on the lower Nelson River must involve the participation of the Cree people in a meaningful and equitable way.

The Northern Flood Agreement First Nations see the Northern Flood Agreement as a modern treaty. And in 2000, Minister Eric

Robinson stated that the Government of Manitoba recognized the Northern Flood Agreement as a modern day treaty. The community with which I work, Tataskweyak, recognizes and acknowledges a well-defined and refined relationship between the original Northern Flood Agreement and subsequent agreements.

When the Keeyask project, originally known as the Gull Rapids project, was introduced as a possibility, the Cree on the lower Nelson were not excited about the prospect. They had seen and felt enough, Hydro was not their friend, and it's fair to say that many saw Hydro as a destroyer of their land and their lives. Indeed, Cree elders referred to Manitoba Hydro as an (Cree spoken). It means the flooder in Cree. There was a resolve not to be a passive bystander in any further development, especially by Manitoba Hydro. The resolve that any project would need to be respectful of their values and culture related to the land, water, and with an understanding of their view of the world.

From the beginning of the consultation on the Keeyask project in 1998, Tataskweyak Cree Nation took the position that they must do their

own environmental assessment of the Keeyask project, based on their knowledge, experience, customs and values, to which Manitoba Hydro agreed.

After further discussion between Manitoba Hydro and Tataskweyak, an environmental protocol was arrived at. Thus there was clear and official recognition from Manitoba Hydro that there would be two separate processes for arriving at an environmental impact assessment, one for the TCN, one for the Tataskweyak, and one for the Partnership's response to the government regulatory environmental assessment requirements. Very early on, the other Keeyask Cree Nations, Fox Lake, York Factory and War Lake, joined in the Keeyask negotiation process with Manitoba Hydro.

The work on the environmental impact assessment continued over a decade without successfully arriving at a way to integrate the result of the two processes. In the final stages of developing the Environmental Impact Statement, it was agreed that the individual Keeyask Cree Nation environmental evaluation reports would be included in a completed EIS with equal weight and recognition given to the environmental reports, as

the western technical science report, which was the response to the EIS guidelines completed by the partnership.

The term Two-track approach was adopted to describe the unique, this unique approach for assessing the effects of Keeyask. For me, it was simply two different ways of looking at the impacts, but they agreed on this term, Two-track approach.

To avoid confusion, it is essential to emphasize that the two processes are different in scope, methods, values and concepts. Equally important, both approaches, but particularly the Cree assessment process, needs to be recognized and respected as being different, equal and separate in the EIS itself.

Aboriginal traditional knowledge and an Aboriginal assessment based on the Cree world view and values are completely different matters. On the one hand, specifics specialized environmental knowledge derived from and a part of Aboriginal traditional knowledge can contribute to the understanding the specific impacts of the project together with sources of information and knowledge derived from western technical science

leading to regulatory approval or rejection.

On the other hand, an assessment of the impacts of the project based on the Cree world view and values is a different and separate process, altogether, since it does not conform to the regulatory concepts and values like significant adverse effects or valued ecosystem components. But it's a reflection and a reaction to the disturbance of a culture and a system that has allowed the Cree to survive for many thousands of years in their ancestral home land.

The Cree and their experience and traditional knowledge also provided essential historical and ecological information to Manitoba Hydro that it would not otherwise have.

The Cree recognize the value of both perspectives that arise from the Cree world view and a science-based knowledge of the larger Canadian society. We accept too that often, science-based approaches to understanding and relating to land and water are similar to some of our own knowledge and understanding through our Aboriginal traditional knowledge. We understand that western science is able to use our traditional knowledge of the physical environment

in the same manner that the non Aboriginal society has selectively used parts of our Aboriginal traditional knowledge since non aboriginals first appeared on the shore of the Hudson Bay.

Because the Keeyask environmental assessment process followed two tracks, it was possible for the Keeyask Cree Nation to participate in and plan the project within the framework of how they understood the world. We believe this provided an important contribution and foundation for the project's sustainable development focus.

Respectful relationships developed between the Cree Nations and Manitoba Hydro to oversee and shape the environmental assessment through such vehicles as a partner's regulatory and licensing committee, the use of environmental impact statement coordinators, topic specific working groups and environmental studies working groups. This participation, including reviewing and approving the filing of the environmental impact statement, also influenced how the evidence would be presented in the environmental impact statement.

In their own environmental evaluation

reports, the Cree have shared their perspectives about how past hydroelectric projects have affected their communities and their desire to restore harmony and balance with Aski and to enhance their culture and tradition. Tataskweyak Cree Nation and War Lake First Nation acting together as a Cree Nation partners, York Factory First Nation and Fox Lake Cree Nation all produce their own separate environmental evaluation reports, but all consistent with the beliefs and values of the Cree world view as expressed in the Keeyask Environmental Statement chapter 2.

The Tataskweyak Cree Nation and the War Lake First Nation, the use of the other Mother Earth ecosystem model, for example, worked with a vision statement, a set of core beliefs, land use planning objectives and the description of their relationships with Aski. And the necessity to adapt and to maintain harmony and balance within their system if their culture is to survive.

For the Fox Lake Cree Nation, their role in the project centred around the documentation of their Aski Kiskentamowin which is a product of the ideal of mino-pimatisiwin which means harmony and balance of all of nature by

living within the spiritual values, wisdom, beliefs and practices that will allow the Fox Lake Cree Nation to maintain their culture.

For the York Factory First Nation, a key focus of their involvement was the concept of stewardship, or Aski Nanakacihtakewin, which means to watch out for and to take care of the lands, waters, wildlife, plants and people of the land as expressed in planning the project and the environmental impact statement. And of equal importance, the ongoing role they will have in implementing, monitoring and managing the project including the use of Aboriginal traditional knowledge.

The Keeyask Cree Nations know the effects of past developments cannot be undone. The way forward lies in enabling the river and the land that has sustained the northern Cree for thousands of years to do so again. After a long deliberation, the Keeyask Cree Nations have decided to support the project for the benefit of present and future generations.

The Keeyask Cree Nation realizes that like previous hydroelectric developments, the project will have some major unavoidable effects.

Knowing this, they are nevertheless hopeful because they believe that the adverse effects agreement and the benefit, provisions in the joint Keeyask development agreement will adequately protect their culture by providing opportunities to engage in the customs, practices and traditions integral to their Cree cultural identity.

Throughout the process and because of it, the Keeyask Cree Nations have changed from people who are sidelined and ignored to people who have found their voice and they had been able to articulate their world view, values and culture, and by doing so have strengthened their position among Canada's first people and within Canada. This is not a small thing and it is at the core of a significant accomplishment of this partnership and this environmental assessment.

This project will cause numerous and widespread environmental and social effects, some of which will have the potential to be significant. However, using past experience, Aboriginal traditional knowledge and leading scientific and engineering techniques, the partnership has mitigated, remediated or compensated for these effects such that each of

the First Nations, as a partnership, has decided that the project should proceed.

In voting to approve the joint Keeyask development agreement, the Keeyask Cree Nations expressed a hope, a hope based on careful evaluation and having their respective adverse effects agreement in place, that the project will help restore harmony and balance in relationships and their lives and that the project will provide opportunities for current and future generations while respecting and caring for Aski.

Thank you.

THE CHAIRMAN: Thank you, Mr. Keeper.

Ms. Cole?

MS. COLE: Good morning, commissioners, elders, youth, partners, hearing participants and others. I'll echo what Shawna said earlier. I am very privileged and humbled to be presenting today with Mr. Keeper. I respect him immensely and have learned a great deal from him throughout the Keeyask planning process. Every time I meet with Joe, I learn about northern history, Aboriginal culture and the Cree world view.

With over 50 years of experience

working on issues of importance to northern First Nations, Joe has been invaluable to the partnership's work.

I have worked with Mr. Keeper and all of the Keeyask Cree Nations since joining Manitoba Hydro in 2005. Since that time, I have worked with them on Keeyask in a variety of capacities, but the one common thread has been working together on environmental matters. As Mr. Keeper has said, the Lower Nelson is not a stranger to development. Development dates back to the early 1900s and the coming of the railroad. He is also correct to say that hydro development in Northern Manitoba has been extensive. There have been large changes to river systems including the Lower Nelson throughout a region the Keeyask Cree Nations, our partners, call home.

In developing these earlier projects, Manitoba Hydro used development practices of the day, practices that would be, by no means, considered acceptable today. Efforts to inform, consult or involve local communities in the process were far more limited than today and informed by very different understandings of Aboriginal rights and interests.

The end result; well, it was the development of Hydro projects for which project effects were not fully understood or appreciated, both within communities and Manitoba Hydro.

This meant initial project mitigation was inadequate and a lot of work had to be done many years after projects were developed to account for project effects.

As Mr. Keeper pointed out, it was only after many years and the successful conclusion of compensation agreements with each of the First Nations in the region that a door opened for discussions on any further Hydro developments. While these agreements laid a foundation for possible future relationships, they were not the only factor. The impact of resource development on Aboriginal people and the environment is now better understood and appreciated as is the need to consult with and involve those most affected by developments, not only for legal reasons but because it is the right thing to do. It results in better projects socially and environmentally.

To be here today talking about Keeyask, a project that has been developed in partnership with four communities previously

affected by Hydro developments is quite remarkable. And even more remarkable from my own perspective is the will, the determination and the commitment it has taken to make this work as partners. It has not been easy, but the project and the assessment are infinitely better as a result of this collaboration.

Leading up to and throughout the Keeyask process, policies, procedures, understandings and attitudes within Manitoba Hydro have changed and changed a lot. As you heard from Shawna earlier, the Manitoba Hydro that negotiated and concluded the Northern Flood Agreement about 20 years ago is not the same Hydro that negotiated the Joint Keeyask Development Agreement or participated in the project's environmental assessment. This has been a collaborative relationship that has resulted in the unique Two-track approach to the environmental impact statement and project assessment that Mr. Keeper has described.

As you have heard, one track, lead by the Cree Nations, evaluated the project based on their Cree world view and 50 years of experience with hydroelectric development.

These assessments are presented in the Keeyask Cree Nation's environmental evaluation reports and are included with our joint environmental impact statement. They have been given equal weight and recognition to technical science.

The other track was lead by the partnership including partner Cree nations and this track assessed the effects of the project in accordance with federal and provincial requirements. This regulatory track included the preparation of a standard environmental assessment provided in the partnership's environmental impact statement as the response to EIS guidelines and supported by subject specific supporting volumes.

The regulatory track has been under way for over a decade and has involved collaboration between Manitoba Hydro and the Cree partners from the beginning. Arrangements for working together were negotiated early on through a 2001 protocol agreement and were formalized in the environmental and regulatory protocol included in the joint Keeyask development agreement.

The protocol established committees for collectively developing the assessment process

and for strategic decision-making among all of the partners. It has been followed throughout the environmental assessment process including the formal regulatory approvals process. At all stages, it has included review and comment by all of the Keeyask Cree Nations and a review and approved function for the Cree Nation Partners. This means that the environmental impact statement could not be filed until the Cree Nation Partners agreed with its contents.

Through the Two-track approach, we were able to assess the project based on both the Cree world view and technical science. This does not mean it resulted into solitudes. It was instead the most important conversation we had throughout the entire environmental assessment allowing the influence of two streams and ways of understanding the world to be present throughout the process.

Sharing perspectives between the western world view with a much different holistic Cree world view was essential for our collaboration. Over the 10 year period, the two perspectives were considered, shared, understood and incorporated into this environmental impact

statement in small and large ways indicative of a respect and understanding of the contribution of both.

The process has included intense consultation, discussion and communication over a period of many years. As partners, we have had many many difficult conversations and have challenged each other regularly to achieve the most comprehensive environmental assessment possible.

Throughout, we have worked hard to maintain an environment of respect and trust and this has allowed us to learn from each other through open and honest discussion.

Involvement of our partners in the regulatory assessment has helped to shape the issues and concerns requiring examination, the nature and extent of field studies and the content of the full environmental impact statement filing. Members have benefitted from jobs associated with the technical field studies. There were also community specific processes that developed over time to allow for a one-on-one sharing of knowledge and experience and to build our collective understanding of the local environment

and possible project effects.

Our partners have provided valuable insight and perspective into what the world was like prior to hydroelectric development, what changed with the development of previous projects and current conditions in their home land. They have also written sections of the regulatory assessment including section 221 of the response to EIS guidelines that presents an overview of the Cree world view.

Most importantly, the Cree have used their knowledge of the land and experience with previous projects to influence and develop measures to reduce the project's environmental effects. They have substantially shaped project plans and the overall environmental assessment process. Their involvement and participation resulted in modifying the design, size and location of the project and helped in the identification of measures to avoid, reduce and mitigate adverse project environmental effects and to enhance positive benefits.

As Shawna mentioned in an earlier presentation, the Cree brought forth a very symbolic change earlier in the process. The name

of the project was changed from Gull Rapids to Keeyask, the name for gull. This change represents how pivotal and influential their participation would become.

At the insistence of our Cree partners, the project offers the lowest reservoir level option among the technically and economically feasible options studied resulting in the least amount of flooding and will operate within a small one metre reservoir variation range.

Our Cree partners also influenced plans that were made for clearing the reservoir, waterways management, ice monitoring, navigation, hazard marking and the reclamation of disturbed sites.

All of this does not mean unanimity of either understanding or agreement on all things about the project. In fact, there are many areas where the world view collided and where there is disagreement among and by individual citizens of the four partner Cree Nations. Where there were substantive differences in the assessment and depending on the circumstances, we collectively agreed that there would be further investigation,

due diligence monitoring and the implementation of adaptive management so that mitigation can be modified or enhanced as necessary.

Working collaboratively on environmental matters will continue throughout project construction and operation, allowing for an ongoing sharing of knowledge and perspectives as we develop Keeyask in the most sustainable way possible.

Each of the Keeyask Cree Nations will have a direct role in monitoring and follow-up activities including implementing community specific Aboriginal traditional knowledge monitoring programs and working with Manitoba Hydro on the implementation of technical scientific monitoring programs.

We are currently working together to determine the nature and scope of the individual community-based monitoring programs. These programs will ensure, to each community's satisfaction, environmental protection above and beyond regulatory compliance and will be consistent with each community's own values, needs and relationships to Aski.

Together we will review and discuss

project outcomes and determine whether adaptive management measures are required. Our partners will also conduct appropriate activities at major project milestones including rituals and ceremonies to show respect and give thanks to Aski.

To conclude and summarize, working within the Keeyask Hydropower Limited Partnership, Manitoba Hydro and the Keeyask Cree Nations have undertaken the Keeyask project and planned for it using technical science, the Cree world view and Aboriginal traditional knowledge along with information gained through extensive public and community involvement and meetings with government.

In what I'm guessing is likely a first in Canada, as a commission and as hearing participants, you have been presented with two different assessments undertaken based on differing world views. And you will have the opportunity to ask each of us questions about the outcomes and findings of these two processes. After hearing about the project description agreed to among the partners, you will hear from the partnership about the regulatory assessment track.

We will present the overall approach for assessing effects followed by a detailed look at the findings for each aspect of the environment considered: Physical, aquatic, terrestrial, and socio-economic. You will then hear directly from the Keeyask Cree Nations about their respective evaluation processes and the conclusions they have reached as communities. Together, we will conclude by talking about how we will continue to work together as partners on environmental matters throughout the life of the project.

There is no doubt that each of these assessment processes is different. The partnership's regulatory assessment of the project is founded on a decade of study and collaboration based on standard environmental assessment practices consistent with guidelines issued by regulators and both federal and provincial legislation.

The Cree environmental evaluation reports reflect the perspectives, concerns and opinions of each community based on their own world view, history and experiences. The two processes have used different methods, and in some cases, made different findings about predicted

effects.

In it's end however, and most importantly, both processes have arrived at the same conclusion, that the project should proceed based on its final design including the extensive suite of enhancement and mitigation measures.

We hope this presentation has provided the Commission and others with a useful snapshot in understanding how we work together to produce the complimentary assessments included within the Keeyask Environmental Assessment. Thank you.

THE CHAIRMAN: Thank you, Ms. Cole. Ms. Pachal?

MS. PACHAL: That completes this presentation.

THE CHAIRMAN: Thank you very much. We will now switch teams and bring up Mr. St. Laurent and others?

MS. PACHAL: Correct. It will probably take about five minutes to get everybody organized.

THE CHAIRMAN: All right. We'll come back in five minutes then.

MS. PACHAL: Thank you.

A little change in plans. We will

take the morning break right now.

(Proceedings recessed at 10:33 a.m.
and reconvened at 10:45 a.m.)

THE CHAIRMAN: We will reconvene. Before we turn it over to the new panel, two items of business first, Ms. Pachal.

MS. PACHAL: Thank you, Mr. Chair. I just wanted to mention yesterday when the Keeyask Hydroelectric Partnership panel was up, we were asked a question by Mr. Madden about the $140 million in process funds that have been paid to date to provide resources to the communities. And he asked me if that $140 million just included the KCN and I answered yes. My staff, as they often do most days, corrected me and reminded me that the $140 million contained in that, includes our four Keeyask Cree Nation partners, MNF, Nisichawayasihk Cree Nation and Shamattawa. Thank you.

THE CHAIRMAN: The other matter, another matter arose earlier this morning and it was discussed further during the break, and that is the fact that some people -- many people noticed that we weren't swearing witnesses in. It has been a long standing practice of the

Commission to do that. Partly a deliberate decision, partly inadvertently. I didn't do it. Now after some discussion -- and I think we won't go into any great discussion today whether or not we should do it. We may reconsider our practice guidelines after these hearings are concluded for future hearing proceedings, but for the remainder of these proceedings on Keeyask we will be swearing the witnesses in. Those who were on panels yesterday and the day before, will be up at future dates and will get sworn in at that time. We will recommence the practice of swearing in witnesses right now. So, Madam secretary.

MS. JOHNSON: Could you please state your names for the record?

THE CHAIRMAN: Could I just interrupt and say that this applies to anybody who is giving evidence. So that's basically anybody who is at the front table. If anybody from the back table comes forwards and starts speaking into a mic, they should be sworn in. If they are just whispering in your ear, they don't need to be.

MR. SCHICK: Glen Shick.

MR. PANTEL: Philip Pantel.

MR. ST. LAURENT: Marc St. Laurent.

MR. MALENCHAK: Jerry Malenchak.

MS. NOTHOVER: Carolyne Northover.

MS. JOHNSON: Okay. Ms. Northover and gentlemen, do you swear or affirm that the evidence which you will give at this hearing will be the truth? We need to hear it.

MR. ST. LAURENT: Yes, yes, yes.

(Project Description Panel Sworn in)

THE CHAIRMAN: Thank you. You may proceed now.

MR. ST. LAURENT: Good morning commissioners and hearing participants. I'm using a lapel mic, can you hear me now?

Good morning commissioners, hearing participants and members of the public. So far you have heard about the Keeyask Hydropower Limited Partnership and the two track approach to undertaking the environmental assessment for the Keeyask Generation project.

It is now my pleasure to provide a description of the project which forms the basis of the environmental assessment. I would like to start by introducing you to the members of the project description panel. My name is Marc St. Laurent and I'm a hydropower planning engineer at

Manitoba Hydro. I have been working at Keeyask since I joined Manitoba Hydro in 1999, first as a hydro technical engineer carrying out hydraulic design, water group studies for the Keeyask project.

I spent four years coordinating physical environment studies for Keeyask, and since 2009 I have been the lead planning engineer for Keeyask leading the stage 4 preliminary engineering studies.

Glen Shick, to my far left, is the manager of Keeyask engineering and construction department. He is responsible for the final design and construction management of the Keeyask generating station. He has been working on the Keeyask project since 2007. Glen started with hydro in 1991 and worked primarily in construction and project management in various areas of the corporation, including nine years of civil projects and maintenance of the lower Nelson generating stations.

Dr. Jarrod Malenchak to my right is a hydro technical engineer at Manitoba Hydro, specializing in hydraulic design, hydraulic modelling, river ice engineering studies. Jarrod

has been working on the Keeyask project since 2009 with the preliminary engineering and physical environment teams. He is currently a Hydro technical design lead for the project.

Carolyne Northover to my far right is a senior environmental specialist in Manitoba Hydro's environmental licensing and protection department. She has 15 years of experience with environmental protection initiatives at Hydro and lead the team that developed environmental protection plans for the Keeyask project.

And Phil Pantel to my left is a senior geo-technical engineering consultant with Hatch Limited, specializing in the design of earth filled structures. Philip has been working on Keeyask since 2002, first on the stage 4 preliminary engineering studies and is currently the geo-technical design lead for the final design.

This presentation will provide the location of the project. It will provide an overview of the project, as well as an overview of the Manitoba Hydro system. It will provide a description of the project components, land requirements, planning phase, construction phase

as well as the operation phase.

If approved, the Keeyask generation project will be located on the lower Nelson River in Northern Manitoba. It will be 725 kilometres northeast of Winnipeg, and 180 kilometres northeast of Thompson. The project will be located in the boreal forest region of the Canadian Shield entirely on Provincial Crown land. The project will be located within the Split Lake resource management area, which is shown in the brown area on the map, and it stretches a large area, upstream -- upstream of the Kelsey Generating Station, up the Burntwood River towards Thompson, north, north of the Churchill River and west as far downstream as the Limestone Generating Station. The map also shows the Fox Lake resource management area in orange just to the east of the Split Lake resource management area, as well as the York Factory resource management area along the Hudson's Bay, as well as the portion of the area just south of Split Lake. The map also shows the War Lake traditional use area which is located south of the Keeyask project within the Split Lake resource management area. Keeyask will be located at Gull Rapids which is shown in the middle of the

map on the lower Nelson River. It will be downstream of Split Lake, off to the left, as well as the Kelsey station. It will be upstream of Manitoba Hydro's three largest generating stations; the Kettle Station, Long Spruce and Limestone. It will be 60 kilometres northeast of Split Lake and 31 kilometres west of Gillam. It will be four kilometres upstream of Stephens Lake, which is the reservoir for the Kettle generating station.

The north access road will link the project to the north to Provincial road 280, and the south access road will link the station to the town of Gillam south of Stephens Lake.

This slide shows an air photo of Gull Rapids where the generating station will be located. A number of slides throughout this presentation will show Gull Rapids and I will be referring to the different channels frequently.

Gull Rapids is a large set of rapids that are spread out over multiple channels. There are three main channels in the rapids; the largest channel is the south channel which conveys about 80 per cent of the river's flow. There is also the middle channel, as well as the small north

channel. There also is a small crossover channel that connects the middle channel and brings water into the south channel.

There is also three large islands in the middle of the rapids, and the rapids will have a total length of 3.7 kilometres from the base of the rapids to the top of the rapids, and will drop an elevation of 12 metres down the rapids. Water flows through the rapids from left to right.

The Nelson River upstream of Gull rapids is quite large. It will be one kilometre in width, and just to put that in perspective that's ten times the width of the Red River here in Winnipeg.

Immediately downstream of Gull Rapids is Stephens Lake. This photo is showing the short reach between Gull Rapids and Stephens Lake. And at the far bottom is one of the photos of Gull Rapids showing how the rapids are very much spread out.

Keeyask has undergone decades of planning resulting in a carefully and well thought out project. Manitoba Hydro and Tataskweyak Cree Nation have worked together for over 20 years to plans this project to avoid, reduce and mitigate

project impacts and to address concerns raised about the project.

War Lake First Nation, Fox Lake Cree Nation and York Factory First Nation have also worked with Manitoba Hydro for over ten years to shape the project.

Keeyask will be a relatively large station with a low head design and a high discharge capacity. It will have a rate of capacity of 695 megawatts which will add about 12 per cent to Manitoba Hydro's system capacity. It will generate 4,400 gigawatt hours of energy each year on average, which is enough power to supply about 400,000 homes in Manitoba.

Subject to regulatory approval, construction will start in the summer of 2014 and take about eight and a half years, finishing in 2022. The project will create 4,225 years of employment at Keeyask. A low head project was selected instead of a high head project to minimize flooding and environmental impacts resulting in a project with less generating capacity.

The Keeyask project will produce renewable energy, hydroelectric energy which will

be sold to Manitoba Hydro and integrated into its electric system for use in Manitoba and export markets.

This slide shows the generating capacity for each generating stations in Manitoba. The height of each bar represents the generation capacity in megawatts. If constructed, Keeyask will be the fourth largest station in Manitoba. Only Long Spruce, Kettle and Limestone would be larger. And it would be about three and a half times larger than the Wuskwatim station which was recently completed.

I will now move on to provide a description of the project components and the land requirements. This rendering shows the lay out of the principal structures at Keeyask, looking north with the river flowing from left to right. The powerhouse is located on the north side of the river and is located about one mile away from the spillway, separated by the central dam. There will also be short dams on the north side of the power house as well as to the south of the spillway to the south side of the river.

Keeyask will be constructed in a very flat area, so it requires extensive dyking, about

23 kilometres in total. Portions of the dyke on the south side, as well as the north side, are shown on this rendering. There is a transmission tower spur downstream of the powerhouse which will have transmission towers and transmission lines south, to the south side of the river.

The rendering also illustrates that a portion of the south channel would be dewatered following construction because the spillway would be built part ways up the rapids. The plan is to actually enhance this area so it won't look exactly as shown on this rendering.

Provincial road 280 will be rerouted across the Keeyask Generating station and we use the north access road, shown at the top, as well as the south access road shown at the bottom of this rendering.

I will now show you a 3D fly through of the Keeyask Generating Station. So this is a view of the project looking upstream towards the reservoir. And we are moving in towards the powerhouse. The powerhouse right in the middle is the building that will contain the turbines and generating equipment that will convert the water to power, into hydroelectric energy. To the left

here is the transmission tower spur, that's got the transmission lines that bring to the south side of the river. And we are just flying along the central dam on the right, and coming up on the spillway. So this is showing the spillway when it wasn't actually being used. There is no water flowing through the spillway, and there would actually be a large pool of water downstream from the spillway, and that will be connected to Stephens Lake with a small little channel that is shown just downstream of that pool. You can see a remnant of the spillway cofferdam beside the spillway, that would be left in place. And again here we have a good view of the dewatered area of the south channel. As I said, there is plans to enhance that area.

We are now moving over the reservoir and getting a nice view downstream. We can see Stephens Lake off in the distance, as well as the short river reach between the Kettle station and Stephens Lake just downstream.

And moving over to the north side of the reservoir, there is a good view of the north dyke which contains the reservoir. And just beside the dyke is the north access road. And at

the bottom of the screen is a -- a small switching station which will be used first for construction power but will be left in place to provide offsite power to Keeyask.

Now we are just moving along the north access road and the road loops around as it goes over the powerhouse and continues across principal structures.

The powerhouse complex contains seven large turbine generators, and the control equipment that will be used to generate the power using the flow of water. It will operate with a head of 18 metres or 59 feet, which is the amount that the water drops from upstream, on the upstream side of the powerhouse through the dam and downstream through the powerhouse. The powerhouse will be constructed so that it will be able to convey up to 4,000 cubic metres of water each and every second. The powerhouse is 250 metres wide, and Provincial road 280 will pass along the powerhouse in behind the structure.

This cross section shows how the river water flows through the powerhouse to generate power. Water flows from left to right. The water will flow out of the reservoir, through the

intake, and up to the turbines. The flow of the water will actually turn the turbines, which then turns the generator equipment inside the powerhouse, which then produces power and is transmitted out of the powerhouse. The water then moves down past the turbines, down through the draft tube and into the tailrace area where the water then continues moving on downstream.

The turbines are going to be a fixed blade vertical propeller type, and there is a photo shown at the top of what a turbine like that looks like. And it will be a relatively large turbine. It will have a diameter of 8.85 metres or 29 feet, which represents the distance across from left to right of the turbine. It will rotate at a speed of 65.5 revolutions per minute, which is roughly one revolution each and every second.

Downstream fish passage will be achieved through the powerhouse, so the turbines are being designed to minimize injury and mortality to fish.

The spillway is a discharge structure that is used when the flows on the Nelson River are high and it exceeds the discharge capacity of the powerhouse. It is a concrete overflow

structure that includes seven bays with motorized vertical lift gates. So each gate will operate independently. And the number of gates and the height those gates will be raised will depend on the amount of excess water that needs to pass down the river. It also provides an overflow, discharge capacity of actually 9,960 cubic metres per second -- it is a typo on the slide -- at the reservoir supply level.

Together the capacity of the powerhouse and the spillway are designed to safely pass the probable maximum flood rate, which is a flood that is 12,700 cubic metres per second, which is about nearly twice the size as the largest flood on record, and has a return period of less than one in ten thousand year flood, which is extremely unlikely to occur.

The length of the spillway is 120 metres. And again, Provincial road 280 will be rerouted behind the spillway, over top. The spillway also provides an important role during construction as it acts as a diversion channel during construction.

As I mentioned earlier, the project will have three dams, the north dam, north of the

powerhouse will be at a length of 100 metres and a maximum height of 25 metres. The central dam will have a height, maximum height of 28 metres over a distance of 1600 metres. And the south dam, south of the spillway will have a maximum height of 22 metres and a length of 565 metres.

The earth dams will generally be founded on bedrock and will be designed so that water does not seep under them.

The crest or top of the dams themselves will be between 3 and 3.6 metres higher than the reservoir level upstream of the dam. That is about 10 to 12 feet higher than the water level.

As mentioned earlier, Keeyask will be constructed in a very flat area, so it requires extensive dyking. This map here shows the full extent of those dykes. There will be 23 kilometres of dykes located along the north side of the reservoir, as well as the south side of the reservoir, in order to contain it. The crest or the top of the dykes will be between 1.8 and 4 metres higher than the reservoir level, or between 6 and 13 feet. The dykes will have a maximum height of 20 metres or 66 feet. A roadway will be

constructed on top of the dykes and between the dyke sections to allow for inspections and maintenance to occur.

The dykes will be founded on mineral soils, and the design of the dykes takes into account permafrost soils and the melting of frozen foundation soils.

The project will have a reservoir with a total area of 93 square kilometres as shown on the map at the top, with the water flowing from left to right, the outlet to Split Lake is on the left and the inlet of Stephens Lake is on the right.

Within the reservoir 48 square kilometres will be existing waterways which is shown in the light blue, so that's existing today. And it will contain 45 square kilometres of newly flooded land, which is shown in the dark blue. The reservoir is predicted to expand by about 7 to 8 square kilometres during the first 30 years after reservoir impoundment due to the erosion of some mineral shorelines and the disintegration of peat lands. The bottom figure shows how the water level drops along this river reach. The dark brown colour represents the elevation of the river

channel bed or the bottom of the river. And the light blue shows how the water level drops from Split Lake to Stephens Lake. And we can see that the large water will drop at Gull Rapids near the dam.

This also shows how the water levels will increase once Keeyask is constructed. And it shows that with the dark blue colour. So once constructed, you can see that Gull Rapids will essentially be inundated at Gull Lake, the water level will rise 7 metres or 23 feet. And as we move further and further upstream the water level rise gets smaller and smaller, up until the point just downstream of Clark Lake where there is no back water effect as a result of the project, and water levels are not expected to rise. And we call that upstream location, the upstream boundary of hydraulic influence. In fact, this is a fundamental design feature of the project, that it be designed such that it does not impact the waters at this level upstream on Split Lake. Downstream of the project there will be a small water level gradient, and water velocities will be impacted in a short section.

The project will require temporary and

permanent infrastructure to support the construction and operation phases. This will include roads and borrow sources, construction camp and work areas, safety and security facilities, as well as communications towers. It also requires explosive magazines, a boat launch, cofferdams and rock groins, waterways and public safety measures, as well as an ice boom and safety booms.

The project will also require some permanent infrastructure. Some of the borrow areas will be permanent as they will be used during the operation phase. The roads to the north, the north access road and south access road will be permanent. There will be a communications tower on the roof of the powerhouse, as well as excavated material placement areas, which I will be describing late on. It also requires a transmission tower spur, some cofferdams and groins will be permanent as they will be left in place and incorporated into the principal structures. There will be safety and security facilities, as well as barge landings, boat launches and a portage.

The infrastructure prior to this

project will be used to construct and operate the Keeyask Generation Project. One project is the Keeyask Infrastructure Project, which is owned by the Partnership, has received licences and construction is underway. The scope of this project includes a start up camp, north access road, phase 1 main camp, contractor work areas, potable water supply, and a wastewater treatment facility. So operation of these components is part of the Keeyask Generation Project and has been assessed.

The Keeyask Transmission Project is another project that will develop construction power lines and substations, generation outlet transmission lines and a switching station. The power lines in the substations will provide power for construction and it will transmit power from Keeyask during the operation phase. This project is currently going in a concurrent regulatory review, and licences have not been granted yet.

The project will have a footprint of 140 square kilometres as shown on this map with the green colour. The footprint includes all of the land that will be required to construct and operate the project. The project will be located

entirely on Crown lands, and the Partnership plans to purchase the lands required for the project. There is no privately owned property within the project footprint. And Federally designated First Nation reserve lands will not be imposed upon by the project's principal structures, reservoir and infrastructure. There are no existing or pending Treaty Land Entitlement selections at the Keeyask site, as it is protected from being selected for a Treaty Land Entitlement.

On behalf of the partnership, Manitoba Hydro will be operating the Keeyask project as part of its integrated power system. So for that reason, and to help explain how Keeyask will operate, an overview of the Manitoba Hydro integrated system is provided.

Manitoba is very fortunate because it is located at the downstream end of two large drainage basins. The Nelson River drainage basin, shown in blue, drains a large area from Alberta, parts of Saskatchewan, a large portion of Manitoba, Northwestern Ontario, as well as a portion of some northern states. All of the rivers that flow in this river basin flow towards Lake Winnipeg, before that water flows down the

Nelson River and into the Hudson Bay.

The Churchill River basin is another large basin which is shown in green, and it lies to the north of the Nelson River basin. Water from that basin flows towards Manitoba into Southern Indian Lake, where along the Burntwood River it is diverted into the Nelson River basin where the water is then used to generate additional power. Manitoba Hydro's integrated power system will have a total installed capacity of 5,700 megawatts, which includes hydro, thermal, wind generation. It includes 15 hydroelectric generating stations.

The lower Nelson generating stations, the Kettle, Long Spruce and Limestone stations, contribute 70 per cent of the system generation capacity. Lake Winnipeg is the largest reservoir which provides about 50 per cent of the system storage. Lake Winnipeg Regulation project regulates outflow seasonally to meet energy demands. Southern Indian Lake also stores water over seasons. The Churchill River Diversion diverts water into the Nelson River to increase the hydropower production on that part of the river.

High voltage, direct current lines, Bipoles I and II, shown in the green lines, in the middle of the box, transmit power from the lower Nelson plants to southern Manitoba. Bipole III received regulatory approval for construction, and that line is shown in the red towards the west side of the province.

There are transmission lines interconnected to Saskatchewan, Ontario and the United States which enable power to be imported and exported. Keeyask will add about 12 per cent generation capacity to the system. As I said before, Manitoba Hydro will operate Keeyask on behalf of the Partnership. Keeyask will operate as part of Manitoba Hydro's integrated power system within constraints of licences and approvals granted for each component, including the Lake Winnipeg Regulation and the Churchill River Diversion projects.

This chart shows how the demand for energy in Manitoba varies throughout the year. So it shows that because of our climate, the peak energy demand occurs in the winter months, and there is less energy demand during the summer months, as well as spring and fall. This blue

curve shows that most of the water flowing from the basins into the system in the spring and summer, occurs during the spring and summertime after the snow melt period. The Lake Winnipeg Regulation, Churchill River Diversion and Grand Rapids store water in the summer so that it can be released at other times of the year so it can produce more energy when it is required.

This chart illustrates how the energy demand also varies throughout the day and the week. The red curves on the very top illustrate how the energy is greatest during the day, that's when people are awake, busy using power; and at night the lights are off, and people are not using as much power. We refer to this top portion where the energy demand varies quite a bit during the day and the night as the peaking load. Through the week there is also a certain amount of power that's required continuously and doesn't change day or night. We refer to the energy in the bottom of this demand profile as the base load or constant energy demand.

I now move on to the project planning phase of the projects. Manitoba Hydro uses a five stage planning process for its

hydroelectric generating stations. The planning process uses a triple bottom line approach that considers, environmental, economic and social responsibility factors of the projects. The chart illustrates the different planning stages where each bar represents a different stage. The height of each bar represents the effort expended in that stage of planning, and the level of efforts generally increases with each subsequent stage. With each stage there is an increasing model of project definition and a decreasing uncertainty about the project. Each of these bars has different colours which represents the relative effort for engineering, environmental and community participation.

The first stage is stage one inventory, which is very high level studies that are undertaken to identify potential sites with very little or no site investigations. The stage 2 feasibility studies aim to confirm if a development is feasible or not, and it is mostly -- most of the effort is engineering. Stage 3 are concept studies which aims to recommend a single preferred alternative to be carried out or to be carried to the next phase of

planning. Stage 4, preliminary engineering, aims to do sufficient engineering, environmental and community participation to reduce uncertainty in costs so that a decision regarding commitment can be made. It also develops sufficient information for environmental assessment, regulatory licensing as well as a design of mitigation measures. Stage 5 is the final design and construction phase. This is the phase where detailed engineering design is undertaken to develop all of the drawings and put contracts in place so that the project can be constructed.

As explained using the cross section of the powerhouse earlier in the presentation, hydroelectric power generation requires flowing water and head or water fall. This is a schematic showing the northern system with the Nelson River in the middle of the schematic, Lake Winnipeg at the top or at the left, and Hudson's Bay to the right. It shows that along the Nelson River from Lake Winnipeg the water level drops a total 217.6 metres. Over this river reach, Manitoba Hydro has developed dams at Jenpeg, Kelsey, Kettle, Long Spruce and Limestone. Upstream of Kettle and downstream of Kelsey, is where the Churchill River

Diversion enters and brings water into Split Lake. The white bands along this reach are potential sites that are identified for future potential development. There is 27 metres of undeveloped head between the Kelsey station, as well as the Kettle generating station.

So again here is our map showing the area between Split Lake upstream, and Stephens Lake downstream, where the water falls about 27 metres over a distance of 55 kilometres. Within that reach, about 12 metres of that 27 metres of head is located at Gull Rapids, which is the largest set of rapids in that reach. There is also additional head at Birthday Rapids further upstream, Long Rapids, which is just downstream of Clark Lake as well as further upstream. Based on this water system profile and the topography, the river reach could be developed in different ways. So since the 1950s, Canada, Manitoba, and Manitoba Hydro have studied options to develop hydro generating stations on this reach of the river. Potential sites were first identified as far back as the early 1900s.

Since the early 1990s Manitoba Hydro has been working closely with Tataskweyak Cree

Nation through a joint planning process. During the planning process several alternatives were considered to develop this river reach. Alternative axes were considered to develop this reach. An axis is a location where the powerhouse, the spillway and the dams would be constructed across the river for that station.

So the green lines at Gull Rapids illustrate the five alternative axes at that location for a dam at Gull Rapids, and the blue lines represent nine different alternative axes for a generating station at Birthday Rapids.

So this slide will illustrate how Manitoba Hydro's five stage planning process was applied to the Keeyask project for the different axes that I had just shown on the previous slide. As I indicated, there are five different axes at Keeyask and nine different axes at Birthday. Although all of those axes are listed along the left side of this chart, and time runs across the top showing the different years of planning.

Stage 1 inventory occurred back in the 1960s, and for these studies there was one axis considered for Keeyask as well as one axis at Birthday Rapids.

The stage 2 feasibility studies were undertaken in the 1970s, as well as the 1980s and 1990s. During these studies there were ten different axes considered.

The stage three concept studies were carried out between 1999 and 2002, and these studies only considered two axes for Keeyask. And the outcome of these studies is a selected preferred axis to be carried to the next phase.

The stage four preliminary engineering studies started, and those aimed to develop sufficient information for the environmental assessment which was ongoing at the same time. Regulatory licensing, as well as a Joint Keeyask Development Agreement, adverse effects agreements, as well as the design of the mitigation measures for the project. These studies were carried out on one preferred axis only.

Stage five, final design and construction started recently after that.

This chart also shows that Manitoba Hydro and Tataskweyak Cree Nation started a joint planning process in 1992. In around the same time there were also meetings held with York Factory First Nation to discuss concerns about the

project. War Lake First Nation and Fox Lake First Nation became involved in 2001.

This next series of slides shows the four main development options that were studied to develop the potential of this river reach. The first option was the development of a single high head site at Gull Rapids. This one large dam would develop the full potential of the river up to Split Lake. The full capacity would be 1,150 megawatts, and as a result, would flood 183 square kilometres, including flooded land on Split Lake.

Option two is an intermediate head single site development, again at Gull Rapids. This option was studied in order to determine how much the reservoir level needed to be lowered in order to not impact the water level on Split Lake, as well as to determine how much less energy would be produced and how much cost the project would have. This project would flood 87 square kilometres, and generate 900 megawatts. So 250 megawatts less than the high head plant.

Option three was the development of two low head sites; one at Gull Rapids and one at Birthday Rapids. Together these two would develop

the full potential of the river reach, so it would have the same generation capacity as a single large dam, but the two plants would flood less land and have less environmental effects. They would flood 106 square kilometres, including some flooding on Split Lake.

And the fourth option is really the current project or the preferred option with a single low head site at Gull Rapids. As I said, it would flood 45 square kilometres with no flooding on Split Lake, and a capacity of 695 megawatts. So this slide is just a recap of the four different options, showing how the flooded area varies between the different projects. In 1996 the high head option was eliminated because of concerns over environmental effects. In 1999 Tataskweyak Cree Nation and Manitoba Hydro decided together to pursue a single low head development at Gull Rapids which would have the least amount of flooding, as well as the least environmental effects. The result is a project that has the least power production of these options. In 2002, an axis with a full supply level of 159 was selected as the preferred option.

This map illustrates the five different axes that were considered at Gull Rapids for developing a station there. The first two axes would have a powerhouse and a spillway that would be constructed downstream of Gull Rapids into Stephens Lake.

The third axis has the spillway and powerhouse a little bit further upstream but still downstream of Gull Rapids.

The fourth option has the powerhouse located along the north side of the station, of the river, and this is the preferred option, as well as the powerhouse located halfway up the south channel.

And then the fifth option is similar with the powerhouse at the north side of the river, but with the powerhouse or with the spillway located further upstream in the south channel.

So these different axes were considered. And the axis four was selected because it has the least capital cost estimate. It also has the least construction risk, as there are a large number of small cofferdams required for the project. It will have the best material

transport logistics, and will actually have a shorter construction schedule, about one year earlier than axis three, which was the next preferred option. It also has the fewer adverse effects and provides more potential for environmental mitigation.

So during the planning and design phase of the project, several project features were optimized. And reservoir level is one example that I will describe in this slide. During the project planning phase, a range of reservoir levels were considered, including levels lower than the 159 reservoir level in the preferred option. It was determined that the reservoir levels below 158 required extensive channel excavation upstream of the powerhouse, so in this north channel where the island is in the north channel, and that's required so a stable ice cover forms upstream of the powerhouse. A stable ice cover is very important upstream of the powerhouse so that ice does not accumulate at the powerhouse affecting its ability to generate effectively plugging up the powerhouse with ice.

The additional channel excavation upstream of the powerhouse results in a more

expensive project with less generation capacity because of the lower head.

In 2009 the Joint Keeyask Development Agreement established fundamental features, fundamental construction and operating features of the project that are of fundamental importance to Tataskweyak Cree Nation or York Factory First Nation, and cannot be altered without their consent.

First is that the north and south access roads must be routed within defined corridors that are included in the JKDA. The powerhouse must be located on the north channel and a spillway in the south channel. The main construction camp must be located on the north side of the Nelson River. There cannot be any change to the CRD or Lake Winnipeg licences, Lake Winnipeg Regulation licences that will be required to construct the project. The operation of the project will not affect water levels on Split Lake during the open water conditions. The original level will have the full supply level of 159 and minimum operating level of 158 metres above sea level. The reservoir level may exceed the full supply level while being drawn down below the

minimum operating level under special or emergency conditions.

I will now move on to the project construction phase. Subject to regulatory approval, project construction is planned to start in the summer of 2014, and will take about eight and a half years to complete. The first unit in service will occur late 2019, and the last unit in 2020. This construction schedule shown on the screen is based on the results of the stage 4 preliminary engineering studies. Once contractors are engaged and become involved in the final design stage, the sequence and schedule may be adjusted. And the next slides illustrate the construction sequence.

So this is a map of Gull Rapids again. And again it shows the south channel on the bottom, and the middle channel and the north channel. So with water flowing from left to right. In order to construct the project, the river will need to be diverted over two stages. Stage one river diversion includes six cofferdams and two rock groins which are shown on this map. There will be a cofferdam in the middle channel which will block the flow of water to the

downstream portion of the middle channel, as well as the north channel. It will direct the flow of water from the upstream end of the middle channel into the south channel. There will be a cofferdam at the powerhouse, as well as another cofferdam around the spillway, and these cofferdams create a dry work area so that these structures can be constructed in the dry. During this stage the entire river flows in the south channel of the river around the spillway where it continues downstream. This phase will last about three years, from 2014 to 2017.

Supporting infrastructure for the project, which is mainly located on the north side of the river, will be completed 2014, 2015. During this phase construction of the dykes will have started and the south access road will be completed.

This photo shows an example of a cofferdam at the Limestone generating station, which creates a dry work area. And it shows the river flowing around the cofferdam to the right and downstream. Cofferdams are constructed to withstand floods and extreme ice conditions.

Once the spillway is sufficiently

complete in 2017, portions of the spillway cofferdam will be removed upstream of the spillway and downstream of the spillway. The spillway gates will be installed, and they will be opened so that the river can start to flow through the spillway. There will be cofferdams and rock groins that will be advanced across the south part of the channel which will then close the river. And during this stage all of the river's flow will pass down the south channel and through the spillway. This stage two river diversion will last about two years from 2017 to 2019.

There will also be an additional cofferdam downstream of the powerhouse in order to excavate the discharge channel for the powerhouse.

During this phase work will continue constructing the powerhouse, the dams and the dykes. Reservoir impoundment will take place in 2019, once the dykes and dams are completed and the powerhouse is sufficiently completed. Seven units will be commissioned in 2019 and 2020, and the spillway will also be completed. Supporting infrastructure will be decommissioned and disturbed sites rehabilitated.

Project construction will require a

camp that will accommodate 2,000 people which will be located on the north side of the river, as shown on the map over here. So it is just off the north access road. The phase 1 500 person camp is being constructed as part of the Keeyask infrastructure project and will be complete by 2014. This phase 1 camp will be sufficient in size for the stage 1 river diversion work to be carried out. The camp will then be expanded by 1500 people by 2016.

With a tight labour market there is a need to have a first class -- have first class amenities to attract and retain workers, so the main camp at Keeyask will be a state of the art camp. This slide shows some renderings of some of the modern features that the camp will have. It will have a modern dining hall shown at the top, a games and entertainment area. It will have a recreational centre with an indoor running track as well as a large theatre that will be used for entertainment, training and workshops.

The camp will also have an Arctic corridor which will allow all workers to access the entire complex without stepping outdoors. Approximately 8.4 million cubic meters of rock,

regular and impervious material, will be required to construct the project.

So this map shows the different borrow areas and rock quarries that have been established for this project. The granular borrow areas are in green, and those will likely be located on the north side of the river. These will be the sources of sand and gravel for the project.

There will also be impervious borrow areas which are shown in orange, and those are shown on the north side, as well as the south side of the Nelson River. These will provide clay material and glacial till material for the project. There will also be rock quarries in Gull Rapids, as well as south of Gull Rapids along the south access road.

Temporary borrow areas will be revegetated where possible. It should be noted that boundaries of some of these borrow areas have been modified in order to avoid and reduce the impacts to sensitive habitats.

Excavations for the principal structures and the removal of the cofferdams will result in approximately 4.17 million cubic metres of earth materials. If possible, the contractors

will use some of this material for construction, but the rest of that material will have to be disposed of.

Contractors will have the option to place the excavated material within any of the 35 alternative excavated material placement areas, which are shown on this map in these brown areas.

Because the principal structures cover a large area, several EMPAs are required to minimize the material hauling distance and construction costs. Some of these EMPAs are located outside of the reservoir, downstream of the principal structures, while others are located in the reservoir, upstream.

Most material will be placed on dry land during construction, and then the EMPAs within the reservoir will be submerged once the reservoir is impounded.

It was determined that the site selection and the design of the EMPAs created an opportunity to reduce project effects during construction. The EMPAs in the reservoir were located to reduce peat resurfacing or promote the development of wetlands along shorelines. They also reduce the impacts to terrestrial habitat

outside of the reservoir because less material will be placed on the terrestrial habitat. These also reduce haul distances which reduces fuel consumption and greenhouse gas emissions. This will also reduce construction costs, since fewer EMPAs outside of the reservoir would require grading, revegetation and drainage works.

Considerable effort was made to set the EMPAs away from sensitive habitats, and the boundaries of these EMPAs were modified to avoid impacts on sensitive habitats.

An important feature of the EMPAs within the reservoir is that they are designed not to erode and not to impact water quality.

Currently there is a large amount of ice that accumulates at the base of Gull Rapids. So, again, here is the map of Gull Rapids, and typically there is a large hanging ice dam that forms at the base of the rapids. This hanging ice dam causes water levels to rise quite a bit during the winter period. An ice boom will be constructed in order to reduce the accumulation of ice downstream of Gull Rapids. This will create a stable ice cover upstream of the ice boom. With this structure, it will reduce construction risks

and construction costs, because water levels downstream will be lower, because there will be no ice dam forming. Cofferdams will not have to be constructed as high. The ice boom itself will be located just upstream of Gull Rapids, circled on this map.

Two of the main borrow areas for the project are located on islands north and downstream of Gull Rapids. Because of the ice boom, or the hanging ice dam that I just described, there has been extensive erosion resulting in those two locations, borrow areas being islands. So in order to access those two borrow areas, temporary rock filled causeways will be constructed across the river channel. There will be one downstream between the mainland and this island here, which is borrow area N5, and there will be another temporary causeway between borrow area N5, and to the north to borrow G3. The causeways will be temporary, and upon completion, they will be removed.

The Keeyask Generating Station would utilize a transmission tower spur that will be constructed downstream of the powerhouse and to the left. This transmission tower spur is

required in order to support four transmission towers which are shown on this rendering. The four towers will support transmission lines that will connect to the powerhouse and bring those lines across the river to the transmission towers located on the south side of the river.

It is anticipated that many employees working at Keeyask during the operation phase will reside in Gillam, so a new road linking Keeyask to Gillam is required. There will be 19 kilometres of new road constructed which will link Keeyask at the left, to the Butnau dam, which is in the middle of the map. There is no road between these two locations today. There is an existing road between the Butnau dam and the Town of Gillam, and this road will be upgraded to Provincial road standards.

The only river crossing will be at the Butnau River near the Butnau dam. There are small water crossings at Gull Rapids, just downstream, or just south of Gull Rapids, and there will be other small creeks that flow into Stephens Lake that the road must cross. The road will be constructed early to allow construction of the south dyke to start earlier. This road will be a

private road during construction and will include a security gate at the Butnau Dam. Manitoba infrastructure and transportation will assume ownership of the road in approximately 2022, where it will then become part of the Provincial road network.

Early in the planning phase, the partner First Nations raised a key concern regarding the impact of floating debris on waterway travel, access and human safety. To mitigate this impact and to reduce the amount of debris on the waterway, the Partner First Nations and Manitoba Hydro decided to clear timber from the reservoir prior to impoundment. Manitoba Hydro and the Partner First Nations worked together to develop a forebay clearing plan shown on the map here. So on this map it shows all of the areas that will be cleared, some areas which are shown in brown will be cleared by hand only and cannot be cleared by machines. These are being cleared by hand because they are sensitive areas. The rest of the area, which is most of reservoir, is likely to be cleared by machines.

Gull Rapids is currently a dangerous waterway for boating and will continue to be a

dangerous waterway during construction. The south channel where the water will be flowing will be a dangerous waterway, because all of the water will be flowing down that channel resulting in very fast moving water.

In addition to the dangerous waterway, Gull Rapids will be an active construction site, which will include blasting and heavy equipment. So for these reasons the public will not be permitted to access the area by road or by water. To prevent boats from moving into the construction zone and the dangerous waterway zone in Gull Rapids, the ice boom, as well as additional safety booms which will be constructed on either side of the ice boom to the shoreline, will form a barrier upstream of Gull Rapids and prevent boats from moving in. There will also be buoys downstream of Gull Rapids warning boaters not to travel close to the construction site on the downstream side.

There will be a boat lunch upstream of Gull Lake, as well as downstream of the powerhouse on the north side. Boat launches will only be used to support the construction activities, and the public will not be permitted to use them.

The project will include a

comprehensive environmental protection program which contains three different types of plans. The first is the environmental protection plans, which include measures to be implemented by the contractors and staff in order to minimize effects of construction. Second are the environmental management plans, which include mitigation focused on specific issues such as sediment, site access, fish habitat and heritage resources. And third is the environmental monitoring plans, which include procedures to monitor effects on the aquatic, terrestrial, physical and socioeconomic environments.

The environmental protection plans will be discussed by this panel because it deals largely with construction. The environmental management plans and the monitoring plans will be addressed by other panels.

There will be two preliminary environmental protection plans which actually have been developed for the generating station, as well as one for the south access road. Drafts of both of these environmental protection plans have been submitted to the regulators.

Environmental protection plans guide

construction and operational activities to have the least adverse effects on the environment and to remain within the limits set by various environmental guidelines, regulations and approvals.

Environmental protection plans are organized by construction activity such as tree clearing, drilling, cofferdam work and in water work. Each of these sections include mitigation measures listed specific to that activity.

The environmental protection plans also include detailed maps of the construction area that show setback distances from sensitive sites, such as caribou calving areas or other rare habitats. It will also include emergency response plans, erosion and sediment control measures, which include specifications for materials and methods to be applied, as well as permits, licences and authorizations received for the project.

Implementation of the environmental protection plans will include the following process: First, the fulfillment of the environmental protection plans by contractors is a contractual obligation. Second, following the

award of a contract, a meeting is set and conducted to introduce contractor's personnel to their roles and responsibilities concerning environmental protection.

There will be, the Partnership will employ site environmental officers to be responsible for compliance monitoring to ensure that contractors follow the requirements set out in the environmental protection plans. If deficiencies are identified by environment officers, specific follow-up actions will be developed and carried out. And lastly, those follow-up actions will be monitored in order to confirm that those deficiencies are satisfactorily addressed.

Keeyask will be a large construction project requiring a lot of people at site. This graph illustrates how the work force will vary over time through the construction phase. During the first few years, the work force will be low, primarily during the cofferdam construction and the excavations. The peak work force will be 1,600 people which will occur during the summers of 2016 and 2017, to coincide with the concrete placement for the powerhouse and spillway. Total

project employment estimate for Keeyask is approximately 4,225 person years. There will be opportunities available within construction support and service trades, non-designated trades, designated trades, contract or supervisory and Manitoba Hydro site staff.

There will be two different types of contracts for this project. The first is the direct negotiated contracts, or DNCs, and these include several service and construction contracts, which will be first directly negotiated with the Partner First Nations. Examples include the south access road construction, catering, and first aid.

The second type of contract are tender contracts. This included a process where several contracts will be publicly tendered, meaning that there will be a competitive process where contractors submit proposals to complete the work. Examples include the general civil contract, and as well as turbines and generators.

With respect to construction hiring, both contracts will have a process. Under the direct negotiated contracts there will be employment opportunities that will be available

for qualified Keeyask Cree Nations and Northern Aboriginal residents through the direct hiring provisions of the DNC.

The first preference is the members of the partner community that was awarded the actual contract. The second preference is members of the remaining partner communities. And then third preference is Aboriginal residents of Northern Manitoba not covered in the first two preferences.

Under tender contracts, employment opportunities will be available for the KCN and Northern Aboriginal residents, which was the first preference in the hiring sequence outlined in the Burntwood/Nelson agreement.

With respect to construction training, the Hydro Northern Training and Employment Initiative was implemented to prepare Aboriginal northerners to participate in northern hydro construction, employment and business opportunities. Approximately 2,600 training opportunities were provided to the communities. And this chart just illustrates those communities that participated.

We will now move on to the project operation phase. So this map shows that outflow

from Split Lake, which is shown in the middle of the map upstream of Gull Rapids, is a result of flow from the Churchill River Diversion, which brings water from the Churchill River from the north, as well as water along the Lake Winnipeg Regulation on the upper Nelson, as well as local inflows and system operation. Outflow from Split Lake will move downstream into the Keeyask reservoir, where it will be used to generate power at Keeyask, before that water travels on to Kettle, Long Spruce and the Limestone Generating Station.

Keeyask will operate using four different modes of operation. These are peaking mode of operation, a base load mode of operation, and as well as special and emergency modes of operation. Keeyask will operate using the peaking or base load modes of operation virtually all of the time. When peaking, it will provide energy for the top portion of the load demand profile that we discussed earlier, shown in the red area. When base loaded, it will provide energy for the bottom portion of the low demand profile shown in blue in that profile.

The reservoir will normally operate

within a narrow one metre range, between 158 and 159, and it will operate between one and seven units. There will be some restrictions to operations during the spring period in order to maintain lake sturgeon spawning habitat downstream of the generating station.

The next slides describe each of the different modes of operation. So this slide explains how the peaking mode of operation works. So typically the daytime period is when more energy is consumed. People are awake, busy using energy, and this period is called the on peak period, which is typically between 6:00 a.m. and 10 p.m.

In order to generate additional power during the day, in order to meet that additional demand, water will be taken from upstream, if that flows into the reservoir, as well as water that will be taken out of the reservoir itself, which allows more water to pass through the powerhouse and generate more power using more turbines. The result is that the flow out of the powerhouse will be a little higher. And throughout that period, as water is coming out of the reservoir storage, the reservoir level upstream will be dropping.

During the off peak period between 10:00 p.m. and 6:00 a.m. is when there is much less energy demand. And at that time there is not a need to generate as much power at Keeyask, so turbines will be shut down, and water flowing from upstream will be put into storage. And over this period, the water level in the reservoir will be going up.

So the result is a reservoir that will fluctuate up and down up to one metre each day. Peaking would not be possible when the flow in the river exceeds the discharge capacity of the powerhouse. So based on historical flows from the CRD and LWR, the Keeyask Generating Station could potentially operate in a peaking mode up to 88 per cent of the time, or less.

This slide shows how a base load of operation works, and it is really quite different than a peaking mode. It serves to generate more of a continuing supply of power. So for this reason it is taking the water that's flowing into the reservoir and passing it directly through the powerhouse and generating power. While base loaded, the reservoir level will be held constant day and night, so there won't be this daily

fluctuation in the level. The outflow from the powerhouse will also be relatively constant.

The Keeyask Generating Station could operate in a base load mode of operation 100 per cent of the time, because it doesn't really depend on the inflow condition.

There would be -- there may be special conditions which may cause the forebay to temporarily exceed the full supply level or be drawn down below the minimum operating level. For example, if there is a lower load rejection, which occurs when units trip off due to mechanical or transmission or other problems. It may also occur if there is a flood management or large rain events or high wind events. It may also result from non-project hydraulic effects such as ice or rapid spring run-off. If this were to occur, the Keeyask Station would operate to return the reservoir levels within the designated one metre range.

With respect to the emergency mode of operation, there may be emergency situations that are highly unlikely that may occur, resulting in the Keeyask station to operate in a mode that's different than all of the other modes. Examples

of this may be the highly unlikely event of the risk of an imminent failure of a dam or dyke, or potentially a downstream accident or event that may require the outflow to be stopped temporarily.

So we talked about the reservoir clearing plan earlier, and this will reduce woody debris within the reservoir, but there will still be debris due to the shoreline erosion and peatland disintegration.

The Partner communities and Manitoba Hydro worked together to develop a waterways management program in order to minimize the impacts of debris. The objective of waterways management program was to contribute to the safe use and enjoyment of the waterway. Boat patrols will monitor the waterway, as well as the travel routes, and remove debris that poses a risk to safe navigation, and to maintain access routes through the reservoir. Boat patrols will monitor along the shorelines for any trees that may become debris, and work crews will be sent out to remove those trees before they actually become debris in the reservoir. The waterways management will be discussed in detail by the physical environment panel.

Safe boating routes and landing sites will be established throughout the reservoir in order to maximize navigation safety and maintain access. So this map illustrates the kind of navigation map that will be produced for the Keeyask reservoir, and it will include things like a primary boat route down the main channel of the reservoir, as well as around some of the main large islands. It will also include designated secondary routes in order to access specific locations around the reservoir.

At each of those locations safe landing sites for boats will be developed. There will also be hazard markers throughout the reservoir in order to mark any dangerous hazards for boaters. There will also be water level gauges throughout the reservoir to tell boaters what the current water level is.

Waterways public safety measures during the operation phase are being developed according to Manitoba Hydro guidelines, Canadian Association guidelines and Transport Canada guidelines. The risk assessment was carried out to identify hazards and measures which were designed to mitigate the risks. The waterways

safe measures include signs which will be located upstream in the reservoir, warning any boaters moving from upstream, as well as downstream for any boaters on the downstream side. There will be fencing and guard rails across the dams and along both sides of the river. There will also be a safety boom upstream of the spillway which will prevent boaters from moving into the spillway while it is operating. There will also be buoys upstream on the reservoir, as well as downstream, marking off the dangerous waterway zones.

There will be two boat launches, one downstream of the powerhouse on the north side, as well as a new boat launch upstream of the powerhouse in the reservoir. Both of these boat launches will be accessible to the public, and there will be a portage linking both of these boat launches.

During the operation phase there will be roughly 38 people that will be working directly at the Keeyask Generating Station. The station will be staffed 24 hours per day, seven days per week. There also will be additional staff working along the lower Nelson River, as well as in Gillam. Gillam will include support staff for

Keeyask, as well as staff that support the other stations on the lower Nelson. There will be staff working on the waterways management program upstream and in the area, as well as ongoing environmental monitoring during the operation phase.

This map illustrates the current road network. Currently Provincial road 280 comes from the west and it is routed north of Stephens Lake before it crosses over the Long Spruce Generating Station. At that point vehicles can continue on to Bird or they can continue on to the Town of Gillam.

Following completion of the project, the north access road and the south access road will become part of the transportation network, and they will be rerouted to use access across the principal structures. This will reduce travel time from the turnoff at PR280 to Gillam by 45 minutes. Manitoba Infrastructure and Transportation Department plans to decommission the section of the road to the north, but this means that the section will lose its designation as a Provincial road and it will become a departmental road once Keeyask is built. So that

road will remain in place.

Manitoba Hydro has an extensive dam safety program, and this program will be applied to Keeyask in order to manage the risk of dam failure during the construction and operation phases of the project. The dams at Keeyask will be designed, monitored and maintained to minimize the risk of a dam failure. The dam safety program is based on the Canadian Dam Association Dam Safety Guidelines published in 2007, which is standard practice by utilities across Canada. Some elements of this dam safety program include site specific dam safety reviews, emergency preparedness plans, emergency response training, exercises and simulations, as well as condition assessments.

The risk of a dam failure during a large flood has been mitigated by designing the Keeyask project to safely pass the probable maximum flood level. The probable maximum flood is an extremely large flood that has an exceptionally low probability of occurring, with less than a one in 10,000 year frequency. The probable maximum is nearly twice as large as the largest flood remembered. Designing Keeyask to

pass the probable maximum flood is in accordance with the Canadians Dam Association Dam Safety Guidelines. So the dam safety program applied to Keeyask, along with design to safely pass the probable maximum flood, mitigates the risk of a dam failure at Keeyask.

So in summary, Keeyask is a carefully planned project that has undergone decades of planning. During the 1990s, Manitoba Hydro and Tataskweyak Cree Nation worked together through a joint planning process resulting in the selection of a low head project that avoids and reduces project effects, and addresses concerns raised by Tataskweyak Cree Nation. Manitoba Hydro and the Partner First Nations worked together to continue planning the project for over ten years, resulting in project features that reduce and mitigate environmental impacts.

Construction will take about eight and a half years requiring temporary and permanent supporting infrastructure. It will have a peak work force of 1,600 people, and generate significant employment and business opportunities for the First Nation and northern Aboriginal residents.

Keeyask will produce energy for domestic and export markets using water which is a renewable resource. Thank you.

THE CHAIRMAN: Thank you, Mr. St. Laurent. Is that it for the presentation for this panel?

MR. ST. LAURENT: Yes.

THE CHAIRMAN: So we can turn now to some questioning from participants. But before we go there, I would like to say a few words about cross-examination. I would note that yesterday's cross-examination was not exactly a stellar example of good cross-examination. Unfortunately, a couple of the key people involved yesterday are not in the room, so I would hope that these remarks get to them.

The intent of cross-examination is to elicit information that is not on the record or to clarify information that is on the record. It is not an opportunity to debate with people on the panel, it is not an opportunity to offer personal comments on what has been put on the record. It is not necessary to have extensive preambles in asking the questions. Some context is certainly allowed, but lengthy preambles should not be part

of it.

There will be an opportunity for all of those of you who are cross-examining to express your opinions and debate certain aspects of what we hear over the next few weeks when it comes time for final argument. There shouldn't be any repetitions in what you are asking, and there shouldn't be any fishing expeditions, and there shouldn't be just rambling talk leading up to your questions. Please ask the questions that are relevant and get them -- get to the point quickly.

If we don't improve on yesterday's cross-examination process, we will be here until the middle of next year, or even worse, I will become a royal pain in the butt, interrupting and moving you along.

So I notice that representatives for the Consumers Association, legal counsel for Consumers are not in the room at this time, and that Mr. Madden from the MMF is not in the room, so I would hope that they receive these comments somehow or other. Because all of you were less than stellar, some closer to not bad, but all were less than stellar. So please keep that in mind as we move to cross-examination today and through the

next number of weeks.

So first up on our cross-examination panel is the Manitoba Wildlands, Ms. Whelan-Enns. And also note that cross-examination is limited to what this panel has presented. Other opportunities for other aspects of this environmental assessment review will arise over the next weeks.

MS. WHELAN ENNS: Mr. Chair, I'm going to lay some paper out first, and I wanted to ask you when you are thinking about the lunch break?

THE CHAIRMAN: At 12:30.

MS. WHELAN ENNS: Thank you.

THE CHAIRMAN: 20 minutes from now.

MS. WHELAN ENNS: Okay. Thank you to the panel. This project description volume, in the review and work in our office, was a real help in the initial assessment. I have some questions to ask that are specific to slides, when they are tagged with a slide number and page number, and others that are to do with the project description, but perhaps a little more overarching. I wanted to ask a question about flooding in terms of the project description contents, and how you arrive at your normal

identified levels of water, for instance. What I'm wanting to know is how Manitoba Hydro, and I presume this is mostly in the engineering part of the utility, uses the highest, lowest and medium numbers in any calculation, anything that you are projecting or measuring, or whether we are basically seeing the middle mean number when you are giving us information?

MR. MALENCHAK: Are you referring to the amount of flooding shown in the presentation by Mr. St. Laurent?

MS. WHELAN ENNS: Yes, but I'm also asking the question where you basically indicate the elevation, you have a variety of instances in your slides where you give us a number. And my reason for asking the question is that I want to know whether these numbers are your median and mean numbers in each of these different measurements in terms of water elevation, water flow?

MR. ST. LAURENT: I think what you are referring to is the reservoir levels that have been established for the project. I explained that the fulsome plan for the project has been defined at an elevation of 159 metres. That is an

elevation that's set regardless of the flow conditions. So it doesn't really -- it is not linked to a specific flow condition, it is the top of the reservoir. The minimum operating level has been set as 158. So those two values are the boundaries of the reservoir itself, and it will operate within that one metre range.

MS. WHELAN ENNS: Thank you. I will see whether there will be specific ones, okay, in the questions that I ask, but I appreciate that. Thank you again also for the high tech, I was looking for the construction phase in the video, and would like to know whether or not the cofferdams and the stages of construction were just simply decided, that this is just a video presentation of final infrastructure?

MR. ST. LAURENT: Yeah, that video represents the project during the operation phase. There is no video that's been developed to show during the construction phase. They are very different phases, as you can imagine.

MS. WHELAN ENNS: Thank you. Going through then the construction phase in your presentation this morning, I was looking for the cement plant. Okay. So the two questions go

together, and I would like to know -- and I was reviewing some of the comments to IRs on this also -- what stage are you at in terms of actually knowing where the rest of the camps, the roads, the 30, 40 options for borrow pits and so on, what stage are you at in terms of knowing where those things are going to be, and are you going to show us?

MR. ST. LAURENT: Are you asking about the batch plant itself?

MS. WHELAN ENNS: As an example of the larger question, yes.

MR. ST. LAURENT: So the project is well into the final design phase, so a lot of those decisions with respect to the location of the batch plant and that supporting infrastructure has been developed, or is currently being developed, and it is well in hand.

MS. WHELAN ENNS: And I presume then, from everything that we have heard, that you are working with the Partners in terms of that final design, in terms of location of everything for the construction phase?

MR. ST. LAURENT: Well, during the preliminary engineering phase there is certainly

work with, you know, with the First Nations to define the general location of project features. I explained earlier that, as an example, the main camp would be located on the north side. So during that phase, that part of the project we defined a general location, a footprint for it.

With respect to the details of the camp itself, the design of the camp, that is something that's being developed during the final design phase, as part of the infrastructure project. And maybe Glen could speak to that?

MR. SCHICK: Yes, I would like to, Glen Schick, I would like to add a little bit more to what Marc is staying.

Within the planning of the project, we have a number of areas that are identified as contractor work site areas. So basically those areas are an open pad area that are made available to the contractor. Now, we are in the process of selecting a general civil works contractor, and when he comes forward, once that contract is awarded, we will review his plans for his actual locations where he is going to situate, say like a concrete batch plant. So that will be all within the confines of those work site areas.

MS. WHELAN ENNS: Thank you very much.

On slide 19 -- it was difficult to hear me for part of the time yesterday morning, so please tell me if I should speak up. Okay, thank you.

On slide 19, you made a reference that I would like to ask you about, and it again goes to my first overarching question. You basically talked about keeping the water in the mean, you said keeping it in the mean. Would you explain what that means? I think it is the crest that you made that reference to --

MR. ST. LAURENT: I'm not sure exactly what you are referring to?

MS. WHELAN ENNS: Well, then maybe we will just leave it for now and then take a look at the transcript. Okay? Thank you.

On slide 20, you made a comment that the reservoir design takes into account permafrost. Would you explain how it takes into account permafrost?

MR. ST. LAURENT: I don't believe that I talked about permafrost on this slide. What you may be referring to is the previous slide where we were talking about the north and south dykes. It

does talk about the fact that we have taken into account the permafrost conditions for the design of the dykes and the melting of frozen foundation soils.

MS. WHELAN ENNS: Thank you for the correction. Writing, listening, and reading at the same time, so apologies on that.

The question then would be, would you give us some more explanation for our understanding of how you take into account permafrost in designing and building the dykes?

MR. ST. LAURENT: There is actually two IRs that describe in quite a lot of detail how those -- how the dykes are designed for ice conditions. And maybe what I will do is get Phil to explain that. Just for reference, those are CEC 70. Yes, that IR explains it in quite detail.

MR. PANTEL: Good morning everyone, my name is Philip Pantel, geo-technical engineer with Hatch. So speaking on how we address permafrost affected foundation in the designs of dams and dykes, specifically here I understand the question is about the dykes, that's the focus of the slide at this point.

We address the design of the dykes by

using two different cross sections for a dyke design. We have a zone and various core dykes which is spoken to in IR 0070, and we also speak of a granular zone dyke. The intent is when we construct the dykes, we also have a field exploration program during construction, so as we are advancing the work, we are actually investigating and exploring foundation conditions so we can adjust our design accordingly based on what we observe.

Now, the zone impervious core dykes will be found directly on the lower tills, which have a low ice contact. And the granular zone dykes will be used where post glacial clays are fairly deep and it is impractical to excavate or remove the permafrost soils completely, so our approach is to use a self gaining granular dyke structure which takes into account permafrost, thawing and foundation consolidation.

MS. WHELAN ENNS: Thank you very much.

MR. ST. LAURENT: If I might add, just so it is clear. Of the 23 kilometres of dyking that we described, it is only a very short, a very small section of dykes that would have that granular feature that would be built on permafrost

affected soils. So of the 23 kilometres it is 185 metres that would have that particular design.

MS. WHELAN ENNS: Thank you. That anticipates the question, so it's appreciated.

I also heard that, if I heard correctly, that you are also in your excavation plans identifying where you may excavate to avoid problems with permafrost. Did I understand what you said?

MR. PANTEL: That's correct, as the excavations are proceeding. Just another note on construction approach is that the initial excavations for both the north and south dyke will take place in the winter conditions to minimize impact on the foundation, so we will be working with frozen ground, so that we do not thaw the permafrost during construction. And then as the construction advances into the summer, we are going to be completing the works accordingly. So, yes, you understood correctly.

MS. WHELAN ENNS: A quick question related, if I may, that it is from slides 84 and 85. And that has to do with dam safety. So do these national dam safety standards and programs that you will be using have an element or

requirement in terms of the generation station and permafrost?

MR. ST. LAURENT: Sorry, I missed the last part of your question?

MS. WHELAN ENNS: There is about three slides here in terms of your dam safety program, and reference to the national standards or requirements that Manitoba Hydro abides by and then applies to generation stations. So I'm asking then if, whether or not in those standards and that program for the generation station, there is a permafrost guide or standard that you use?

MR. PANTEL: Just give me a moment to confer with the back row, please?

I don't have any specific reference with the CDA guidelines with respect to permafrost with me at the moment. But speaking in the design of structures, we have numerous guidelines that are not just the CDA guidelines that are being referenced in the design of earth filled structures. For geo-tech we have the Canadian Geotechnical Foundation Manual guideline, which is a primary reference for the structure design, and that takes into account foundation design.

MS. WHELAN ENNS: Thank you. We will

leave that for now. I wanted to ask a question, and this goes to slide 23. This is basically images then in terms of supporting structure. We were some what surprised at the -- so I want some clarification of this in terms of the IR process. There is a suggestion from Manitoba Hydro that the borrow pits after construction and in the operation phase, that some of them in fact would be transferred or compensatory habitat for amphibians. So I want to ask a question about that, but I think best to check to see whether or not the Chair would like that with this panel or later when we get to species?

THE CHAIRMAN: I think that would be more appropriate with a later panel.

MS. WHELAN ENNS: All right, thank you.

When we were at slide 26, you made a comment that has to do with TLE land selection which I need to ask because I did not understand it. Again, qualifier on this is that this is not a question on behalf of any First Nation but rather one for clarification. We know that there are no TLE land selections currently in -- this is the RSA, LSA or the project area?

MR. ST. LAURENT: What I'm referring to is within the land that's shaded in that slide. So it is quite specific to the actual footprint. The footprint is that zone defined by all of those polygons.

MS. WHELAN ENNS: Thank you.

The second part of the question then is, you said, it sounds like I was not sure of it all. I believe you said something about how there will not be any TLE land selections?

MR. ST. LAURENT: What I said is that there is no existing or pending TLE selections within that footprint area.

MS. WHELAN ENNS: Thank you.

On slide 30, I would like to ask for information about which converter station will handle the energy from the Keeyask Generation Station? We have maps and visuals today where the converter stations aren't there. So which converter station will handle the energy from Keeyask?

MR. ST. LAURENT: So in the north I talked about the transmission project. Those transmission lines will come from Keeyask, pass south of Stephens Lake, and they will be connected

to the Radisson Converter Station.

MS. WHELAN ENNS: Okay. And the second part of the question is, which Bipole will carry the energy from the Keeyask Generation Station?

MR. ST. LAURENT: My colleague explained to me that the Radisson Converter Station is connected to Bipoles I and II.

MS. WHELAN ENNS: Thank you very much.

On slide 32, in terms of base and peak loads -- and, yes, this content in the EIS and later filings in this regard -- I just wanted to ask you why you left the numbers off?

MR. ST. LAURENT: This is just an example demand curve for Manitoba. It varies from week to week, month to month and year to year, so it is more of an illustrative.

MS. WHELAN ENNS: You are showing proportion, thank you.

THE CHAIRMAN: We will break now for lunch and come back at 1:30, please.

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

THE CHAIRMAN: We'll reconvene, please. I believe the Partnership has one

undertaking to respond to. Ms. Pachal?

MS. PACHAL: Thank you, Mr. Chair.

Yes, yesterday I undertook a question from Mr. Madden. The question was: Was Hydro directed by the Government of Manitoba to enter into a partnership with respect to the Keeyask project? And the answer is no, we were not.

THE CHAIRMAN: Thank you. Continuing with cross-examination, I'd remind you of my earlier comments about rambling and being to the point. So Ms. Whelan Enns?

MS. WHELAN ENNS: Thank you, Mr. Chair.

In reference to slide number 34, would you tell us whether all of the work in the project planning process that's in your graph was done by Manitoba Hydro personnel, as in staff, or whether it's a mix, and which firms were involved?

THE CHAIRMAN: What's the relevance of that?

MS. WHALEN ENNS: Well, many of the questions we are posing have to do for preparation for witnesses and presenters. If you consider that one irrelevant, then we'll go on, Mr. Chair.

THE CHAIRMAN: No, I'm just asking you

to explain its relevance.

MS. WHELAN ENNS: The larger reason for the question is to basically be able to track where some of the conclusions are from.

THE CHAIRMAN: The conclusions are contained in the Environmental Impact Statement and the supporting documents. Does it matter whether somebody from Manitoba Hydro or somebody from X, Y, Z consulting wrote that piece?

MS. WHELAN ENNS: We are in the first week of the hearings, and sometimes an intent in a cross-examination question is actually to help plan cross-examination for other panels. But as I said, if you're concerned, I have no problem going on to the next question.

THE CHAIRMAN: I'll let you get away with it for now. So carry on. You can ask the question and then we'll see.

MS. WHALEN ENNS: I'll ask it again then. In terms of the page 34 slide and the five stages of project planning, would you tell us if all of this work was done by Manitoba Hydro personnel?

MR. ST. LAURENT: Work is undertaken by Hydro personnel as well as consultants.

MS. WHALEN ENNS: And are there particular areas of expertise or firms who contributed to the five stages of planning, as in what did you seek outside the utility?

MR. ST. LAURENT: During these planning studies, we engaged consultants to take on much of the work. I wouldn't say it's one specific area, but more of, actually more of a collaborative approach between Hydro and consultants. So I don't know if I can pinpoint to a specific area done by consultants.

MS. WHALEN ENNS: Thank you. We'll carry on.

I also wanted to ask you on page 34, what's included in community participation? It's a clarification question because, of course, there are four partners to the Keeyask Generation Project. So what is in that yellow box, when you say community participation?

MR. ST. LAURENT: It would be the sort of participation that's shown on slide 38, where we indicate when Tataskweyak Cree Nation, York Factory First Nation, War Lake and Fox Lake became involved in the planning process in the early 1990s and then later on in around 2001.

MS. WHALEN ENNS: Thank you. Then we can take that as meaning that the public engagement stages, there was three stages of it, are not shown then in the project planning chart?

MR. ST. LAURENT: Yeah, that's not necessarily shown on this particular chart. It's a very busy chart, there's a lot of information. But, you know, certainly, you know, the public engagement happened later on in the planning process.

MS. WHALEN ENNS: Thank you. On page 37, and probably the next one also, but basically the simple question, and that is, is there currently an intention to building Birthday Rapids Generation Station? The second part of the question is whether there's any discussion with the Cree Partnership Nations regarding Birthday Rapids Generation Station?

MR. ST. LAURENT: So the first question is, is there an intent to develop Birthday Rapids. Right now the Birthday Rapids site is not contained within the development plan that Manitoba Hydro has.

Can you repeat the second question?

MS. WHELAN ENNS: Is there any

discussion between Manitoba Hydro and the Cree Nations who are partners in Keeyask Generation Station regarding Birthday Rapids as a future project?

MR. ST. LAURENT: I'm not involved with all the discussions on the partnership, so I'm not sure if I'd be the best person to answer that.

THE CHAIRMAN: I think by answering no to the first question, that took care of the second.

MS. WHELAN ENNS: I think so, yes.

Turning to page 49, you have made reference, and I understand the reference to final design decisions. Would you let us know how Manitoba Hydro would accommodate a design decision, a change that was needed if there was already a licence in place for the Keeyask Generation Station?

MR. ST. LAURENT: So we're into the final design stage of the Keeyask project. A lot of the major decisions on the project have already been made with respect to the reservoir level, the layout of the principal structures and so forth. So we don't envision things of that nature

changing. But certainly during the final design phase there may be small changes. And of course any of those changes would need to be done in a way where it abides by the conditions of the licences and within the assessment.

MS. WHELAN ENNS: Thank you.

This is a follow-up question with respect to an IR. Could you tell us how, what stage Manitoba Hydro is at in terms of sharing data and informing and helping to build up the forest resource inventory for the Province?

MR. ST. LAURENT: Sorry, which IR is that?

MS. WHALEN ENNS: I don't have the number in front of me. I can go through the binder. My apologies on that. We can wait for the answer on that, but there's a clear indication in the IR that this discussion had begun.

MR. ST. LAURENT: I don't have the IR in front of me.

MS. WHALEN ENNS: When I switch to the binder, we may find it. My apologies on that.

On page 53, would you tell us the cost of the state of the art camp? And that question would assume the maximum of 2,000 residents?

THE CHAIRMAN: What's the relevance of that?

MS. WHELAN ENNS: The context for this has to do with the Manitoba Wildlands experts from BC and their lifecycle assessment.

THE CHAIRMAN: I don't understand how the costs of the camp would contribute to that?

MS. WHELAN ENNS: I am not an expert in LCAs, Mr. Chair, but having an evaluation then helps in terms of their steps to assess materials for the LCA. If you want to pass, that's fine.

THE CHAIRMAN: Mr. Bedford?

MR. BEDFORD: One of the concerns we'll have, and Mr. Schick could correct me, but I think we're still shopping for a provider for some of the facilities for the camp. So to release that, what would be our estimate publicly prejudices one getting the best price when you go shopping.

MR. SCHICK: Actually, Doug, we have -- like the camp is awarded in two phases, because we are actually constructing the first phase under the Keeyask Infrastructure Project. The second portion of the contract would be the additional 1,500 room accommodations. That

portion of the contract is an optional, upon receiving our licence to proceed with the project and the partnership willing to proceed with the project. And those numbers are confidential at the moment, because the contract hasn't officially been awarded for the second phase.

MS. WHALEN ENNS: Thank you. Thank you both.

On page 56 of your presentation, this goes to perhaps a limited understanding of EMPAs, but would you please give us some additional information then in terms of how EMPAs that would be in the lake future reservoir reduce project impacts? This is post clearing, as I understand it, where the areas are dry, and this is fill, to use a really simple term, before being submerged. So there is an assumption here in terms of reducing impacts. Could you please give us a couple of specifics?

MR. ST. LAURENT: So there is a number of opportunities that we identified to reduce project impacts, by putting the fill in some locations in the reservoir. One opportunity was the fact that in the reservoir, once a reservoir is impounded, there will be peat submerged and it

has the potential to float up and resurface. And our consultant identified that if we put a layer of mineral soils over top of that peat, that it would reduce some of the resurfacing of the peat. So we identified locations that have a moderate to high probability of the peat resurfacing, and locating some of the EMPAs on those sites. So it would result in reduction in peat resurfacing.

Another example was the fact that just by placing material, less material in the terrestrial environment outside the reservoir into the reservoir, results in a reduction in impacts to terrestrial habitat. So that in itself is a benefit to the terrestrial habitat.

What we did is we started off by talking to our aquatics and terrestrial specialists, and they identified what sort of opportunities might exist. That's just two examples that they identified.

MS. WHELAN ENNS: Thank you. Much appreciated, thank you.

On page 21, which is reservoir clearing and connected to the previous question -- sorry, 61. This question is to clarify the EIS contents in terms of clearing. When will the

clearing occur?

MR. ST. LAURENT: In the EIS in the -- the description is supporting volume, section 3.7, it indicates that it will start in August of -- sorry, yeah, beginning in the winter of 2014/2015, and it will last a couple of seasons.

MS. WHELAN ENNS: Why is the clearing intended to be as far ahead of the cofferdam and the construction phase?

MR. ST. LAURENT: I believe the reason why it's happening throughout the construction phase is it's a very large area, it's 45 square kilometres of area that needs to be cleared and it's a large undertaking for any contractor. So we are spreading, you know, that work needs to be -- it really can't take place over a single season.

MS. WHELAN ENNS: And it needs to be winter activity, correct?

MR. SCHICK: Yes, that is what I was going to add, much of it is a winter activity because the accessibility into these areas is a little tougher. Plus it's also a direct negotiated contract with our Cree Nation Partners, and it gives them an opportunity to get additional

employment throughout the project earlier on in that stage.

MS. WHELAN ENNS: On page 66, this is about the EPPs, and would you give us an indication as to how, as the final EPPs are arrived at, how they will be made public?

MS. NORTHOVER: The Environmental Protection Plans are going to be, as they are currently posted on the website, and as we go to a final Environmental Protection Plans, they will also be posted on the Keeyask website. They also will be part of Manitoba Conservation's public registry.

MS. WHELAN ENNS: Thank you. Does that include monitoring reports also, any audits in terms of the plans, any adjustments or changes to new standards or actions with the three kinds of plans?

MS. NORTHOVER: I'm just reading along. Yeah, monitoring reports will be posted as they become available. Basically, for sure on an annual basis we'll be reporting on monitoring. So in terms of the Environmental Protection Plans, that will be compliance with the Environmental Protection Plans. Those will be the reports that

are provided. I think that's the only part -- is there another part to your question?

MS. WHELAN ENNS: Yes, I was asking then, if there are updates, changes, improvements, I mean, this is a construction period and then a long operation period, so the second part of the question was whether then if there are, shall we say new versions of the plans, whether the same pattern would hold?

MS. NORTHOVER: Yeah. So if there are revisions to the Environmental Protection Plans, they will be also, the revisions will be posted.

MS. WHELAN ENNS: Thank you.

A quick question on page 72, which is a map. It's fairly common when looking at maps of the hydro system in Northern Manitoba to look for the Churchill River Diversion. So I wanted to ask whether there was a decision to not show the Churchill River Diversion, not tag it, in what you're providing us today?

MR. ST. LAURENT: The map is showing the Churchill River Diversion, it's just not labelled as such. But I believe when I was talking about this map, I did explain and tried to point out where the CRD would be located.

MS. WHELAN ENNS: Yes, thank you, it was in your oral comments, thank you.

Now, page 73, which of these modes of operation -- and again, listening while you're presenting means the questions are going to be together -- I'd like to know both based on 74 and 73 about your mode of operation for extreme drought, and is there a plan for extreme drought?

MR. ST. LAURENT: During a drought condition, exactly how Keeyask will operate will ultimately depend on the requirements of Manitoba Hydro's integrated system. But in all likelihood, it would tend to operate in a baseload mode of operation, where the reservoir would be held at the full supply level.

MS. WHALEN ENNS: Thank you. This sequence of slides in terms of modes of operation goes right through from 72 to 74. I wanted to ask then again in relation to sort of 73 and 74, and then your special mode of operation on page 77, which of these modes of operation then -- and you'll have examples I think in the system already -- would be relevant for the water levels in Northern Manitoba in 2005, which was the most water in 30 years on the North Saskatchewan, I

believe, and then the water levels in a system in 2011?

MR. ST. LAURENT: The years that you are discussing are high flow years. And during those years, the flow on the river coming out of the Nelson River would be beyond the capacity of the powerhouse of the generating station. So excess flows would be passed through the spillway.

MS. WHELAN ENNS: Thank you.

On to page 74, you have a reference to the normal operation of the reservoir being within a one metre range. As a non-engineer, non-scientist, I'll try the earlier question again. And that is, if you arrive at the normal operation being within the one metre range, then what's the full range? What's likely, what's the top and the bottom of the range that causes you to arrive at saying that one metre is going to be the normal?

MR. ST. LAURENT: So I think, as I explained earlier, the reservoir level has been set at, the full supply level has been set at a particular level of 159, and the minimum operating level at 158. Those are hard levels for the top and the bottom of the active storage of the

reservoir. And the plant itself will have full control over the operation of that reservoir, and it will operate in a way where it will maintain water levels within that one metre range.

MS. WHELAN ENNS: Is this different than the range, for instance, on Stephens Lake, which I believe is three metres?

MR. ST. LAURENT: Stephens Lake has a larger operating range than what Keeyask would have.

MS. WHELAN ENNS: Thank you.

On page 79, this is a question about debris. Our understanding is that the Cree Nation Partners have been fairly specific about wanting to avoid anything akin to an underwater forest.

So what I wanted to ask you then, combined with a question about clearing, is what you expect, and what your expectation is in debris? Is it a correct assumption that overall the construction plan, the clearing plan and so on will reduce debris compared to other reservoirs?

MR. ST. LAURENT: So this is -- you're starting to get into some of the effects of the project on the reservoir and, you know, that's something I think would be much better handled by

the --

MS. WHALEN ENNS: Excuse me.

MR. ST. LAURENT: -- physical environment, where there's a whole component dealing with the issue of debris resulting from the project.

MS. WHELAN ENNS: Good referral, thank you.

Mr. Chair, I have some questions tagged in the binder with me also, but I wanted to check in terms of time availability and your preference.

THE CHAIRMAN: I don't understand what you just said.

MS. WHELAN ENNS: I'm asking you whether or not you have more time for Manitoba Wildlands cross-examination questions, I have some more tagged in the binder beside me, or whether you would like us --

THE CHAIRMAN: If they are directly related to what this panel has presented, then they are in order.

MS. WHELAN ENNS: Thank you. Just checking. We'll aim for that.

Please, Mr. St. Laurent, let me know

if you have a reference to another panel on these, because that will make a difference in terms of use of time.

So what stage are the topographical surveys for the dewatered area at?

MR. ST. LAURENT: So, I think you're referring to the dewatered area of the south channel, that will be downstream of the spillway in the south end. That's an area, as I said, that has a lot of flow in the Nelson River. Most of the river flows down that channel, and there's very fast moving water. So we're not able to collect bathymetry and develop topographic information in that area. We'll have to wait, basically wait until that area is dewatered. And then the plan is to collect that information.

MS. WHELAN ENNS: Thank you.

If there was an over-estimation of the operation phase footprint, as Manitoba Hydro has indicated in IR answers, what does that mean? Does that mean that since your initial estimation of the footprint, you have in your design and in your planning realized that you basically are going to use a smaller area? So this is IR number 0034?

MR. ST. LAURENT: Is that Manitoba Wildlands's IR 34?

MS. WHALEN ENNS: Um-hum. The answer indicates that you, perhaps -- sorry, I'll frame it as a question. Have you found that you're going to disturb less -- fewer areas?

MR. ST. LAURENT: So the footprint itself has been established in a way where, and maybe I didn't fully explain that on the slide but there are different shades of green. Sorry, which slide is that? It's number 26. So there's different categories of the footprints. There is those areas shaded in dark green that are planned to be disturbed. We, in fact, are fairly sure that we'll be disturbing those areas. And then there are -- the light green areas represent the possibly disturbed footprint area. And that's additional area that may or may not be impacted. And we would expect that not all of that area would be impacted. So in all likelihood, the actual footprint will be smaller than what is shown on that map.

MS. WHALEN ENNS: And that would account for it. Thank you very much.

How many kilometres of temporary road

is there? And this goes to Manitoba Wildlands 0037 answer, but it just, it didn't -- it didn't, it wasn't clear.

MR. ST. LAURENT: Sorry, which one?

MS. WHELAN ENNS: This is 0037, Manitoba Wildlands. And there is an indication of temporary roads and access trails. And there is five or six examples of them. How long will they exist and what does temporary mean?

MR. ST. LAURENT: So the IR tries to characterize the length of the different types of roads, which is the question of the IR, how many kilometres will there be of the different types of roads? Based on the designs that we have in place, there are some haul roads that we know will be in place to access cofferdams, as an example. And we are able to provide links for that. But, you know, there are other locations where at the moment it's not possible to determine exactly how many haul roads or how long the haul road would be. An example would be in the reservoir, to support reservoir clearing or other activities.

So in this IR, it was our best attempt to try to estimate as much as we could, but it's not possible to estimate the length of all

potential haul roads.

MS. WHELAN ENNS: Thank you.

Would you give us stage one and stage two river diversion information in relation to the cofferdam, as in which cofferdam in stage one and which cofferdam stage two?

THE CHAIRMAN: Isn't that provided?

MR. ST. LAURENT: It's shown on the map.

THE CHAIRMAN: I think it's shown on the map.

MS. WHELAN ENNS: Thank you.

Has the risk review for stage two river management been completed?

MR. MALENCHAL: Jarrod Malenchal here. As part of our early design studies for river management for final design, we did our risk review on the cofferdams. And the stage one risk review was completed for the stage one cofferdam, and the stage two is nearing completion.

MS. WHELAN ENNS: Thank you.

The earlier reference, if I may, in terms of an IR number to the forest resource inventory to the province is in IR 0044. It happens to be a Peguis First Nation IR. And I

think it would be appreciated to know whether that data is going to be put in the public domain as the discussions, as the answers it sort of sounded like it would happen. I was just basically giving you the IR number.

Mr. Chair, I'm done.

THE CHAIRMAN: Thank you very much, Ms. Whelan Enns.

MS. WHELAN ENNS: Thank you.

THE CHAIRMAN: Next on our list, I don't see anyone from York Factory elders.

Peguis First Nation?

MS. LAND: Thank you. Panel, my name is Lorraine Land, I'm legal counsel for Peguis First Nation.

I only have a couple of sets of questions for you today about the evidence that you gave this morning and the related documents in the project description.

So in your materials this morning, in your slides, number 29 to 31, you were describing the integrated power system that you are planning this project to be connected to. Those are the slides on the water supply and energy demand and the integrated power system.

So this is a question, I suppose, for Mr. St. Laurent, and probably also for somebody with the hydrology engineering, probably Mr. Malenchal.

You said that the project was planned in a manner that ensured that the water was stored in the Lake Winnipeg Regulation and CRD areas to allow increased flow in the summer at the dam site to provide more power at peak season of demand. Is that correct?

MR. ST. LAURENT: What you're referring to is the operation of Lake Winnipeg Regulation project?

MS. LAND: Yes. And that you planned this project to link to that Lake Winnipeg Regulation Project in terms of being part of the process of managing the flow of water and then the supply and demand in the energy markets this would assist in meeting through that system?

MR. ST. LAURENT: So Keeyask will be located on the Nelson River, upstream of Kettle, Long Spruce and Limestone. And it will generate the power using the water that comes out of Stephens Lake, which is a combination of water from the upper Nelson and the Churchill River

Diversion.

MS. LAND: And so is it fair to say that the project is designed in a way that it integrates into the Lake Winnipeg Regulation and Churchill River Diversion management systems in terms of coordinating the storage and release of water supply at different times in order to meet demands, market demands for energy?

MR. ST. LAURENT: Keeyask will be part of the overall integrated power system for Manitoba Hydro.

MS. LAND: Okay. So can I take you then to slide 75 of your materials this morning? And that was when you were talking about the special modes of operation and the peaking modes of operation.

Am I correct in understanding then that -- let me just see here. You refer to, specifically on slide 77, the special mode of operation, you referred to the special conditions that may cause the forebay to temporary exceed the full supply level or draw down, including non-project hydraulic effects and flood management. Would non-project hydraulic effects and flood management include hydraulic inputs from

sources other than the vicinity of the project specifically?

MR. MALENCHAL: Sorry, I think you are referring to two separate bullets there?

MS. LAND: Right.

MR. MALENCHAL: The fourth bullet, that relates to non-project hydraulic effects, that is referring to localized run-off events like hydrology close to the project. And the flood management would be, in the event of an extreme, very, very extreme flood event, as Marc pointed out in his presentation, that the forebay could surcharge above the full supply level, 159, under very unlikely flood event.

MS. LAND: Right. So then when you were talking about non-project hydraulic effects and you were talking about other inputs, other hydraulic inputs, would that include hydraulic sources, water sources that are coming into the project area from upstream?

MR. MALENCHAL: So I'm not entirely clear on your question, but I think what you're getting at is, what makes up the inflows to Keeyask?

MS. LAND: That's correct. So my

understanding is based on the questions I just gave you, that you are saying that this project is designed to integrate into the rest of the system?

MR. MALENCHAL: That's correct.

MS. LAND: And my question for you then is, when you're looking at non-project hydraulic effects, does that include hydraulic effects, including water inputs that are happening upstream from the project, outside of the immediate vicinity of the dam itself?

MR. MALENCHAL: Okay. Yes, thanks for clarifying. That is correct, it considers both.

MS. LAND: So would it be correct to say then that some of those hydraulic effects and inputs could arise because of water management choice that are made upstream?

MR. MALENCHAL: When we're talking about these extreme flood events that we have to manage, there aren't really much choices for us to make. We're basically spilling the excess water and we're just passing it downstream. There are no choices to make.

MS. LAND: And in a general operational base load mode, or peaking mode, would it be fair to say that the hydraulic inputs that

you would be managing would include hydraulic inputs from upstream, water management decisions made upstream, if it's an integrated system?

MR. MALENCHAL: Overall that would be correct, but those decisions are made on more of a monthly and seasonal basis, whereas the peaking mode of operation is on an hourly and daily operating regime.

MS. LAND: Right, okay, that's helpful.

So, conversely, would it be fair to say that the choices that are made about the storage and the flow at the dam site itself would have hydraulic effects upstream, if it's an integrated system?

MR. ST. LAURENT: Maybe I'll try to answer that, it's a complex question.

So as we said before, Keeyask is going to operate as part of Hydro's integrated system, and it's going to operate within the constraints and the licences and approvals granted for the facilities, including Lake Winnipeg Regulation and Churchill River Diversion. And that's explained in a couple of IRs, PFN 32. And so really the dominant factor influencing system operations is

the amount of water inflow to the system, which varies widely from year to year. But there are other factors that cause that. The amount of water inflows that can result as -- that can cause changes include increased load as a result of growth in Manitoba Hydro's domestic load, or changes in export sales, changes in export transmission capability, as well as the addition of other supply.

MS. LAND: Okay. I understood that.

So what you're saying is that the integrated system allows you to manage the water flow for the purpose of generating the energy to be input into the overall system to meet those market demands, and to address the exigencies that you just talked about. And I guess then my question for you is, so you're saying that it's an integrated system for the purpose of managing the supply and demand. But my question is, is the hydrology also linked to impacts upstream of those decisions that you're making at the dam site in terms of flows of water? And is that built into your project description in terms of what you assessed and did not assess?

MR. MALENCHAL: So if I understand

your question correctly, you're wondering if the decisions made at Keeyask affect the water, management water levels further upstream?

MS. LAND: That's correct.

MR. MALENCHAL: So Keeyask is integrated into our system, but actually Keeyask receives the water from upstream, and then we operate Keeyask in response to the supply and demand balance and the water that's coming from upstream.

MS. LAND: Are you saying that the hydrological effects, or the hydraulic inputs only go one way, they only go downstream, that there's no hydrological link between the dam and what happens upstream?

MR. MALENCHAL: No, that wouldn't be what I'm referring to. There is obviously, there is the backwater effect of the station that does extend upstream. But I think what you're getting at is a question that we have discussed in the past. And basically we have assessed, and we have actually discussed with various stakeholders whether or not a plant, integrating a plant like Keeyask into our integrated system would have any substantial or discernible changes to water levels

upstream. And we found that not to be the case.

MS. LAND: Okay, good.

Well, let's go to then some of the discussion that you had about the -- in terms of the project planning, some of those discussions that you had to determine that and make that assessment that there were no impacts upstream.

So in slides 36 to 38, actually about slides 34 to 38, this is when you were talking about the project planning process. And that would have been where you would have gone to the communities to have those discussions that you just mentioned. So in slide 36, when you're talking about the options -- let me just see here. Actually, I'll take you to slide 34, the project planning process. So this is the five-stage planning process that you outlined for us.

So if I understand it correctly then, it's at stage four of this process where you talk to potentially affected communities?

MR. ST. LAURENT: No, that's not accurate. There were discussions prior to stage four with potentially affected communities.

MS. LAND: Okay. So when you had those discussions before, would that have

happened -- from what point on, would that have been from stage one or stage two?

MR. ST. LAURENT: That would have been late in stage two, where on slide 38 it shows that there was engagement with Tataskweyak Cree Nation. Starting in 1992 was the joint planning process between Manitoba Hydro and Tataskweyak Cree Nation.

MS. LAND: Right. And at that point, would you have spoken to communities upstream beyond the four partners in the project?

MR. ST. LAURENT: Not that I'm aware of.

MS. LAND: Okay. And in terms of that chart, you may or may not have the answer to this in terms of how you plan the project. But can you tell me at what point in time you would have anticipated talking to communities like my client, Peguis, which are upstream, and say that they are affected? Where would that have fit into your planning process?

MR. ST. LAURENT: This chart shows the planning process that occurred for Keeyask, so I'm not sure -- it's more of a recount of what has happened.

MS. LAND: So you're saying that they weren't included in that is what you are saying then?

MR. ST. LAURENT: During the early '90s, the involvement was with Tataskweyak Cree Nation in a joint planning process. So early on in the planning project, it was recognized that there was that high head development option, and it was known even at that time with the amount of planning that had been done, that there would have been some, you know, some effects on the lake. There would have been some flooding of land on Split Lake. So there was an engagement with Tataskweyak as well as some discussions with York, because it was known at those times -- at that time that those communities would have been impacted by a project of that magnitude. And it was important at that time to engage them.

MS. LAND: And just to confirm then, then those discussions about the impact of that original plan were confined to the four Partner First Nations, including the two that you mentioned?

MR. ST. LAURENT: At that time, there was no reason to go beyond those communities.

MS. LAND: And why would you perceive that there would be no reason to talk to communities upstream beyond the four impacted First Nations, in terms of planning the project and how you design it?

MR. ST. LAURENT: I think I have said as much as I can about the planning that took place back in the early 1990s. There, you know, to the best of my knowledge, there wasn't any more.

MS. LAND: Okay, that's fine. I'll leave my questions there. Thank you.

THE CHAIRMAN: Thank you, Ms. Land.

Next on the list Manitoba Metis Federation.

MS. SAUNDERS: Good afternoon, Jessica Saunders. You heard from Mr. Madden yesterday that I will be assisting him in his representation of MMF.

THE CHAIRMAN: Yes, welcome.

MS. SAUNDERS: Thank you.

I have one area of questioning. On slide 69, regarding construction hiring, you will note under the tendered contract section that employment opportunities are available for the KCN

and northern Aboriginal residents through the first preference in the hiring sequence outlined in the Burntwood/Nelson agreement. You will then note under the direct negotiated contract section that employment opportunities are available for qualified KCNs and northern Aboriginal residents through the direct hire provisions for direct negotiated contracts. And of particular note, the third preference, to Aboriginal residents of Northern Manitoba.

With respect to Aboriginal residents of Northern Manitoba in the direct negotiated contract section, can you indicate how applicants under this category will be verified specifically with respect to their identification as Aboriginal?

MR. SCHICK: I believe during panel one, we encountered that same question. And through the job referral service, which is managed by the Province of Manitoba, we would be requesting an identification from the applicants to confirm their residency, and their location, and their status of Aboriginal.

MS. SAUNDERS: Okay. My apologies, I'm not sure if this was already dealt with in

that same panel, but then can you indicate specifics with respect to what happens when an applicant identifies as Metis?

MR. SCHICK: The Province would ask for some form of identification, normally, the card indicating a member of the Manitoba Metis Federation, and that would be sufficient in that case to prove a status of that.

Actually, my colleague provided a little more information, and it could also be a document from the government indicating, because not all people would be under the Manitoba Metis Federation card, so a government indicating that they are entitled to the same privileges.

MS. SAUNDERS: My apologies, government, if you could clarify that last part?

MR. SCHICK: So it could be any government document that would indicate that the person is a Metis. So it doesn't necessarily have to be the Manitoba Metis Federation identification card.

MS. SAUNDERS: Any government document, okay. Will there be any kind of indication as to what type of documentation that may be in these contracts, or is it just like

any -- if there can be an example provided?

MR. SCHICK: I guess any type of Federal Government letter that would indicate, I guess, would include the person's name, that would be applicable for that.

THE CHAIRMAN: Or Provincial Government.

MR. SCHICK: Or Provincial Government, yeah, for that case.

MS. SAUNDERS: Okay, thank you. Those are all my questions. Thank you.

THE CHAIRMAN: Thank you, Ms. Saunders. Consumers Association has no questions?

MR. WILLIAMS: That's correct.

THE CHAIRMAN: Fox Lake Citizens?

MS. PAWLOWSKA-MAINVILLE: Good afternoon. The first question I have would be about page 35. So as engineers, and you were looking for having a project in the north, when did you first come to Fox Lake and speak with the elders about the best place to put the next foreseeable project, which ended up to be Keeyask?

MR. ST. LAURENT: I don't know the answer to that. I don't know when the first time

somebody came to Fox Lake to tell them about the development at Keeyask.

MS. PAWLOWSKA-MAINVILLE: Is that information that we could find out?

MR. ST. LAURENT: There will be another panel that will discuss in detail the engagement of the public. And I think they will be in a better position to answer that question.

MS. PAWLOWSKA-MAINVILLE: Okay. Which somewhat leads me to my next question, is as engineers, have you spoken with any of the Fox Lake elders and their use of Aboriginal knowledge to see if there is any engineering negative impacts, or positive impacts, or the best engineering practices that they know of in regards to Keeyask?

MR. ST. LAURENT: As I explained earlier in the presentation, Fox Lake became quite engaged with the Keeyask project, and I think it was 2001, in around that year. And from that point on, there was engagement with Fox as well as the other partner communities, through a number of different processes. There is a project description committee as part of the JKDA negotiations, as well as environmental studies

working groups where people from all the communities participated and were able to provide their perspectives, and helped to shape various aspects of the project.

MS. PAWLOWSKA-MAINVILLE: But as engineers, you didn't speak with the elders about the mechanisms behind having such a project and use traditional Aboriginal knowledge about sharing and discussing some of the benefits of the project in regard to its construction?

MR. ST. LAURENT: Certainly there was. I mean, I can use a couple of examples where there was quite a lot of involvement. The development of the forebay clearing plan as well as the waterways management program were plans that were developed with Hydro and community members, and there was a lot of perspectives provided on how to best clear the forebay, how to best manage the waterways. And those, you know, those perspectives, based on their perspectives and experiences of past projects, helped shaped those plans. So based on their experiences with past projects, that perspective brought itself into those two particular plans. I don't know if that answers your question.

MS. PAWLOWSKA-MAINVILLE: Somewhat. Well, you keep speaking about plans in terms of clearing and plans in terms of management systems. I'm talking directly for the physical infrastructure of Keeyask, did you have a chance to speak with them and ask them whether or not this and this and this design of this project is what you agree with?

MR. ST. LAURENT: The plans for the project, all of the principal structures, all of the infrastructure were certainly shared with the community members on several occasions. I have to admit, I wasn't at a lot of those meetings so I can't provide a specific example, there may have been, but there was certainly lots of opportunities.

MS. PAWLOWSKA-MAINVILLE: So the plans were shared with the community. Was there a chance for them to have input?

THE CHAIRMAN: Can I interrupt? I think there will be another panel, I know there will be another panel that will address the community engagement process.

MS. PAWLOWSKA-MAINVILLE: Okay.

THE CHAIRMAN: And I suspect that

those questions would be more appropriately directed to them.

MS. PAWLOWSKA-MAINVILLE: That's fine.

THE CHAIRMAN: They would have specific answers which we can't expect this panel to have.

MS. PAWLOWSKA-MAINVILLE: Okay. I can raise this at the other panel. Thank you.

So my next question would be on page 19 of your presentation. What do you mean by disposing of the extra excavated material?

MR. ST. LAURENT: So in order to construct the principal structures, the dykes, the dams, the powerhouse, the spillway, there is a need to excavate material. And along the footprint of the different dykes, and some of that material cannot be used for construction. Where we can use that material, whether it's granular material, or mineral soils, or other types of material, where we can use that material, the plan would be to use that but there's some material that don't meet the specifications required to use it for constructing the structures. So the contractor needs to move it somewhere and dispose of it.

So in order to accommodate that, the contractor will need places to put that material. There was a process to identify a number of options that will be suitable from an environmental perspective, as well as from a cost perspective, that are technically acceptable, and designate those as areas that the contractor can then go to and put that excess material.

MS. PAWLOWSKA-MAINVILLE: Will that excess material be most likely placed in Fox Lake territory?

MR. ST. LAURENT: That map on the slide 56 shows the locations of all of those excavated material placement areas, and they are all around the Keeyask Generating Station.

MS. PAWLOWSKA-MAINVILLE: Okay, thank you. Which brings me actually to the next question, which is on about page 56, so just clarify for me, please, the excavated material that's placed, and that's the brown spots, some of it is placed in the reservoir, will that be the material that will be flooded, that will be within the reservoir?

MR. ST. LAURENT: So the EMPAs that are located in the reservoir, those would be

utilized by the contractor before the reservoir is actually impounded. So the contractor would place that material with heavy machinery. And once the construction is sufficiently completed and the reservoir is then impounded, the water level comes up and then that land upstream of the structures will then be flooded. So those excavated material placement areas that are on that flooded land will then be submerged under water.

MS. PAWLOWSKA-MAINVILLE: In your previous answer, you stated that some of that material could actually be soil and soil minerals, which brings me to another point which you said earlier about water quality being kept the same. How do you answer the fact that if you put loose soil material and submerge it, it will not impact water quality?

MR. ST. LAURENT: So these excavated material placement areas are designed features. They have been carefully designed so that the material that is placed in them will not erode by the flow of water. So a lot of these locations are in areas well away from the river where the velocities are very low. And based on design parameters, we know what amount of water velocity

it would take to scour or mobilize that mineral soil and bring it up into the water. And these are being located in areas where the velocity isn't that high. Or they are being filled -- the height of these placement areas are being set such that they can be filled to a certain level without getting too high such that they would start to erode.

So I think the short answer is they are being designed so that they don't erode by the flow of water in the reservoir.

MS. PAWLOWSKA-MAINVILLE: Okay, thank you. My next question refers to pages 22 to 24. So you said that there is a large number of supporting infrastructure that you mentioned on those pages. Where will this infrastructure be located, on the north or south of the reservoir?

MR. ST. LAURENT: I think the easiest thing to do would be to point to, there's several maps in the EIS. I'm just wondering if this presentation has a map that shows all of the infrastructure? Oh, I think there would be.

If you go to slide 51 which is showing the stage 1, or the stage 2 river diversion, it's a reasonably good map that's showing where a lot

of that supporting infrastructure would be located. The vast majority of it would be on the north side of the river off of the north access road.

MS. PAWLOWSKA-MAINVILLE: Vast majority meaning the explosive magazines, that boat lunch, public safety measure and ice booms will also be located on the north side?

MR. ST. LAURENT: There's a map that we'll pull up that shows where everything is located. So this is a map from the EIS that essentially shows where all that different infrastructure would be located. And as I said earlier, most of that infrastructure is on the north side of the river. This shows the camp location. There's a helicopter pad. This line here is the north access road. There's a work area, a substation or a small switching station as well as another contractor work area. You mentioned the boat launches. There will be a boat launch downstream of the rapids as well as upstream on Gull Lake. This map shows that there's not a lot of infrastructure on the south side with the exception of the south access road and some other components.

MS. PAWLOWSKA-MAINVILLE: By not a lot -- sorry, could you clarify what will be placed on the south side?

MR. ST. LAURENT: Well, the permanent infrastructure will be the south access road. During construction, there will be a security gate near the Butnau Dam because that road between the Butnau Dam, the site would be a private road for construction.

I mentioned the borrow areas, so there are some borrow areas on the south side. That is part of the infrastructure. Some of the excavated material placement areas will be on the south side. Rock quarries. Is that what you're looking for?

MS. PAWLOWSKA-MAINVILLE: That's good. Where can I find out some of this stuff that will be located on the east side? Could you point me to it?

MR. ST. LAURENT: There's a project description supporting volume that supports the EIS and there's a section in there that describes all of the infrastructure in detail with respect to what there will be, where it will be located. There's quite a number of maps as well. So a lot

of that information is there.

MS. PAWLOWSKA-MAINVILLE: Thank you. And then on page 19, you say that dykes are founded on mineral soils. Can you please elaborate on that?

MR. PANTEL: I can explain that a little clearer. During construction of the dykes, we are going to excavate the organic layer on the top and just expose firm foundation material to set the rest of the dyke on. And what we call and use the term mineral soils, it's your silts and your till and that's what we call mineral soil. So silts, clays.

MS. PAWLOWSKA-MAINVILLE: So there will be nothing actually built into the ground?

MR. PANTEL: The core of the dams and structures have to rest on an impervious foundation as well or on suitable foundations. So we are looking at placing the core for the dams on the bedrock. And the core for the dykes will be resting on till with the exception of the granular dyke section which we talked about earlier. That will be resting on permafrost affected post glacial clays.

MS. PAWLOWSKA-MAINVILLE: So how many

kilometres would you say approximately of the north and south dykes will be not placed into the ground, there will be something layered on top of them?

MR. PANTEL: In the project description manual, we reference to the different lengths of these dyke structures and the dykes for Keeyask are discontinuous. That means that they are not all linked to one another because they follow high ground. In between, there will be road sections and freeboard sections. To venture a number just off the top, four kilometres of zone impervious core dykes both on the north and again four kilometres on the south side that would be structures found on these mineral soils.

MS. PAWLOWSKA-MAINVILLE: Thank you. And you also said that there would be limited access on the road. There even will be a security gate at Butnau Dam and there will be no access during blasting and construction, that's correct?

MR. SCHICK: Okay. The south access road will be restricted to all public transportation until the completion of the generating station project. And that until such time as the Manitoba infrastructure and

transportation take over that portion of the road.

MS. PAWLOWSKA-MAINVILLE: How long will you anticipate that will be?

MR. SCHICK: Probably 2022 in that range, '21/'22, depending on the progress of the project.

MS. PAWLOWSKA-MAINVILLE: How will you manage ease of access to local First Nations in that area? Will they be allowed to use the road?

MR. SCHICK: That will be under probably some of the other panels for the access management plan. But because it's an active construction site, we maintain control that if there are trails for the First Nations that they traditionally use, we will make sure that they get access to those trails. But it will all be under a controlled system so that we know for the safety of them and the workers.

MS. PAWLOWSKA-MAINVILLE: So in regards to access, I can discuss this at another panel? Thank you.

MS. NORTHOVER: I will just add. It will actually be the socio-economic panel that will have the whole piece on the construction of the access management plan. So any detailed

questions, you can ask them.

MS. PAWLOWSKA-MAINVILLE: Thank you.

And then I had a few more questions in regards to page 30. This is just, the arrows pointing west, does that mean there will be a converter station built around that area at some point in the future or will the energy that's powered through the AC -- through the DC current from Bipole III be converted in the south and then exported east and west?

MR. ST. LAURENT: Just to clarify, each of those green arrows represents an interconnect or transmission line connected to the neighboring provinces and to the United States, they are not converter stations.

MS. PAWLOWSKA-MAINVILLE: So the power from the Bipole III DC line will be converted at the Winnipeg station?

MR. ST. LAURENT: I think you are referring to that green arrow that's touching the Bipole III. That's not meant to illustrate that at that location, power can go into Saskatchewan off the Bipole.

MS. PAWLOWSKA-MAINVILLE: I'm not talking about the green lines, I'm talking about

the red line which is the Bipole III.

MR. ST. LAURENT: Okay.

MS. PAWLOWSKA-MAINVILLE: So the energy from Bipole III will be converted at the Winnipeg station and then carried out and exported through the connecting lines.

THE CHAIRMAN: Perhaps I can help, having been through the Wuskwatim process. I believe that power would originate either at Wuskwatim or Grand Rapids.

MS. PAWLOWSKA-MAINVILLE: Thank you. And then I have another question as well. What is the net weight of the reservoir or what is predicted to be at peak weight, at peak height?

MR. ST. LAURENT: I don't know.

MS. PAWLOWSKA-MAINVILLE: I guess I'm looking for the net volume weight of the reservoir at its peak.

MR. ST. LAURENT: One figure I can tell you is the volume of the active storage zone of the reservoir. It's the one metre of storage between 158 and 159. And further upstream, that's got a total volume of 81.4 million cubic metres of water. And of course there's water below that. I don't have at my fingertips the total volume. But

that's something that is available. We have the total volume of the reservoir.

MS. PAWLOWSKA-MAINVILLE: I would like to have that number, if possible, the total volume weight.

MR. ST. LAURENT: Would you like the volume or the weight?

MS. PAWLOWSKA-MAINVILLE: Both actually. And also if you can add to that the net weight, volume, including --

THE CHAIRMAN: Help me, what's the relevance of knowing the weight of the water?

MS. PAWLOWSKA-MAINVILLE: Well it's actually relevant to know how much the impact of the water will have on the earth's crust.

THE CHAIRMAN: And how is that relevant to this overall review?

MS. PAWLOWSKA-MAINVILLE: Because if Keeyask is built, it's another weight on that territory that will impact the earth's crust in addition to the other --

THE CHAIRMAN: Okay. If they know the volume, it shouldn't be too hard to come up with the weight. So okay.

(UNDERTAKING #1: Advise of the net volume and weight of the reservoir at its peak)

MS. PAWLOWSKA-MAINVILLE: Thank you. That's all the questions I have for now.

THE CHAIRMAN: Thank you, Ms. Pawlowksa-Mainville.

Pimicikamak, Ms. Kearns.

MS. KEARNS: I'm Stephanie Kearns, legal counsel for Pimicikamak. My questions are going to track through your slides in order.

And I'm going to start at slide 34, which there's already been some questions on this so I will be brief. Point two on this slide says, the triple bottom line approach that considers environmental, economic and social responsibility factors of the project. So economics is one of the three bottom lines, correct?

MR. ST. LAURENT: Yes.

MS. KEARNS: But this table does not actually show economics, does it?

MR. ST. LAURENT: No, it's just a bar chart. It's trying to show in a simple way the relative level of efforts expended on the actual studies themselves in the different stages.

MS. KEARNS: So this table doesn't

actually reflect the consideration of how the triple bottom line was considered?

MR. ST. LAURENT: It's showing the level of effort expended from the stages, just trying to illustrate that each subsequent stage, more and more effort is expended.

MS. KEARNS: Okay. Thank you. Next to slide 38, am I correct that since Pimicikamak is not shown on this chart, you did not consult with or engage with Pimicikamak in this planning process?

MR. ST. LAURENT: This planning process, as you can see, it extends up till today. We're still into stage five. And I believe there's a panel that will be able to talk about engagement in a much more detailed way than we can.

MS. KEARNS: Okay. Thank you. Turning to slide 60, have all work permits been issued by Manitoba, to the partnership by Manitoba Hydro for the infrastructure projects that are being built?

MS. NORTHOVER: Yes, to date every permit that needs to be acquired has been acquired.

MS. KEARNS: So Manitoba Hydro or the Partnership will not be asking for any more work permits related to the Keeyask project and infrastructure?

MS. NORTHOVER: It is possible that more work permits will be required. They are on a, generally have an annual dating. So potentially at the end of the fiscal year more work permits will be required.

MS. KEARNS: Thank you. So turning to slide 61, how many acres of land are being cleared of trees?

MR. ST. LAURENT: Well, the total flooded area would be cleared, that's 45 square kilometres of land. I don't know what that is in acres.

MS. KEARNS: That's fine. Thank you. And do you know how many tonnes of timber that translates into?

MR. ST. LAURENT: I do not know the volume or tonnes of timber that that would --

MS. KEARNS: And where is the timber that's harvested going?

MR. ST. LAURENT: The plan is to -- the plan is to stockpile the timber in the

reservoir, in one winter when it's dried, and burn it in the following winter.

MS. KEARNS: Will it be burned on site?

MR. ST. LAURENT: It would be burned in windrows in that reservoir area, so on site, yeah.

MS. KEARNS: Thank you. And so this process involves cutting the trees, but the stumps and roots will remain; is that correct?

MR. ST. LAURENT: I just have to dig up details. So I'm just opening up these project description supporting volume because there's a detailed description of how the clearing would be undertaken. There will be two main methods of clearing. The first is hand clearing. And when the hand clearing is undertaken, that would not result in the stumps being removed, it would just be cut near the bottom of the tree and the tree would be removed. Most of the reservoir, we expect, would be cleared by machine. And that would involve shear blading during the winter when the ground is frozen. And using this method, the clear method material would deposit in windrows left to burn and dry. And this will result in the

stumps being sheared off, meaning the stumps will actually be removed as part of that process, along with any other vegetation. So the smaller trees, shrubs, loose and dead wood debris, humax and sphagnum moss, that will all be accumulated by the shear blading and piled up.

MS. KEARNS: But the roots would remain in both processes, right?

MR. ST. LAURENT: The roots, to the extent they are not attached to the stump, so the stumps themselves would be sheared off.

MS. KEARNS: Okay. Thank you.

So would you agree that when the stumps and roots remain in either process, depending on the amount of stump or root, to the extent that those stumps and roots remain, there is the possibility that when erosion occurs when the land is flooded, that those stumps or roots will then enter the water as debris?

MR. ST. LAURENT: The stumps themselves would be included in that in the pile of debris that would be burned, or material that would be burned.

MS. KEARNS: But in the hand process, the stumps are remaining?

MR. ST. LAURENT: That's right.

MS. KEARNS: So when the lands are flooded and erosion occurs, the stumps and roots that are remaining would enter the water as debris; is that correct?

MR. ST. LAURENT: I suppose that's possible. But there are other reasons why, you know, there are reasons why those areas are being cleared by hand, because they are sensitive habitats, culturally significant locations. So that was the reason why I went with hand clearing.

MS. KEARNS: Okay. Thank you. And just following up with an answer before about what happens to the timber, did the partnership or Manitoba Hydro consider using the timber to give to communities as firewood, or to use in a green energy program, other than just burning it on site?

MR. ST. LAURENT: Absolutely. Yeah, that was definitely a consideration. Early on in the reservoir clearing planning process, there was an interest in trying to see if that timber could be used for other purposes rather than just burning it. And the result was that no economic method was available for using that timber.

Because it is being cleared out of a large area in the reservoir, just hauling it out of the reservoir requires a significant amount of fuel. So it's just not economic to haul that material.

But having said that, there will be some timber that will be cleared closer to the access road, and there is plans to set aside some of that timber, both on the south side and the north side of the generating station, for the public to come and take firewood should they choose to do so.

MS. KEARNS: So just to clarify, so the economic reason is it would be too expensive to lug it out and give it to other people or organizations to use?

MR. ST. LAURENT: That's correct.

MS. KEARNS: Turning then to slide 80. So this slide was about the safe boating routes and landings. What about the safe passage of animals like moose and caribou who also cross the waterway?

MR. ST. LAURENT: That's not something we can really speak to on this panel. There will be another panel dealing with aquatic and terrestrial issues, and I believe they would be in

a good position to talk about that.

MS. KEARNS: Thank you. Turning then to slide 85. Point number 2 says the probable maximum flood is an extremely large flood that has an exceptionally low probability of occurring, with less than a one in 10,000 year frequency.

My question is, did you consider the possible effects of climate change in determining what a one in 10,000 year flood would look like?

MR. MALENCHAK: Jarrod Malenchak again. That particular question was actually answered in CEC PFN IR 14.

MS. KEARNS: That was PFN?

MR. MALENCHAK: Yeah.

MS. KEARNS: And the answer, quickly, yes or no?

MR. MALENCHAK: When we consider the dam classification of Keeyask, which then lead us to incorporate the PFN as our design, we looked to the Canadian Dam Association Guidelines. And on this particular topic, it's quoted in the IR, but basically they provided the following statement:

"It is expected that the variability of extreme events, floods and droughts will increase, but it is not possible

to quantify this change. All these changes are quite recent and intense research is active in that domain, but thus far no generally accepted methodology exists to evaluate the effect of climate change on flood frequencies. Until the scientific community defines safe practices, high and extreme floods should be evaluated with a realistic degree of conservatism and flood frequency estimates should be updated as frequently as possible."

So in that regard, the PMF itself has an inherent conservatism built into it because it's an estimate of the probable maximum flood. And as part of the dam safety program, Keeyask will be reviewed on a regular basis during the operation period, which will include a review of the design flood, which is in this case the probable maximum flood.

MS. KEARNS: So then just to clarify, so because at this time there's no certain way to determine what climate change is going to look like, it's not taken into account in this

assessment?

MR. MALENCHAK: So the choice of the inflow design flood, in this case the PMF is an engineering design criteria, and industry practice has not, or industry has not come up with an appropriate method of considering climate change at this point in time on extreme floods like this.

MS. KEARNS: So then it's not considered, climate change, at this time?

MR. MALENCHAK: At this time that is correct, yes. And as more information becomes available, we will incorporate that to the extent that we need to.

MS. KEARNS: Okay. Thank you. And are there any dam break analyses for any other generation stations in the system?

MR. MALENCHAK: For every one of our stations, there is an emergency preparedness plan which requires an analysis of the dam break scenario.

MS. KEARNS: What is that called again?

MR. MALENCHAK: Emergency preparedness plan.

MS. KEARNS: And this emergency

preparedness plan includes a dam break analysis?

MR. MALENCHAK: Yes.

MS. KEARNS: And one exists for Jenpeg?

MR. MALENCHAK: Yes, yes.

MS. KEARNS: Okay. Those are my questions. Thank you.

THE CHAIRMAN: Thank you, Ms. Kearns.

That completes the participants' questions. I have a couple of questions and some of my colleagues might have some, I'm not sure.

You refer on page 10, or slide 10 you note that the annual energy production for Keeyask is going to be 4400 gigawatt hours. And then beginning at page 39, you list four options, 1150, 900, the two station model and then the Keeyask model. Then you give the megawattage, but you don't give the annual energy production for each of those. Is that available?

MR. ST. LAURENT: The amount of energy would be proportional to the capacity of each of those stations.

THE CHAIRMAN: It would be directly proportional?

MR. ST. LAURENT: I don't know if it

would be directly proportional, but it would be pretty close.

THE CHAIRMAN: So I guess what I'm trying to get at is whether the annual energy production ability of these other options played a significant role in deciding not to go with them, or it was not a major part of the consideration.

MR. ST. LAURENT: The main reason was environmental considerations.

THE CHAIRMAN: Okay. In your reach development on page 35, and some of this was addressed earlier, you answered Ms. Whelan Enns about Birthday Rapids not being in the development plan anymore, are Whitemud and Red Rock still in the development plans?

MR. ST. LAURENT: As far as I know, they are not in the current development plan.

THE CHAIRMAN: Do Conawapa and Gillam Island remain as possibilities?

MR. ST. LAURENT: I believe Conawapa is in the development plan. I don't believe Gillam Island is in the development plan itself.

THE CHAIRMAN: Historically, I'm just, you have talked a lot about comparing the 1150-megawatt option with the current option, and

the fact that it cut the amount of flooding to a quarter. But how seriously was the high level 1150-megawatt option ever considered? I mean, historically, from about the mid '60s, when the Northern Manitoba development was first announced by the premier of the day, probably until the late '90s, the two, upper and lower Gull were always part of the development plan. So, I mean, was it just an option that was thrown in for comparison, or was it ever seriously considered?

MR. ST. LAURENT: It was, as part of the planning process, it's important to assess all of the available options. Certainly the high head option was viewed as a potentially viable option. A lot of effort was put into it. We had concepts developed, and I would say for that reason, because a lot of effort was put into it, it was taken very seriously. There was -- just thinking about all of the geotechnical site investigations, there was a lot of dyke lines that were surveyed, borrow areas were investigated for that high head option, requiring a lot more material. So it was considered, it was definitely considered.

THE CHAIRMAN: About what stage of the planning process did you get to with those?

MR. ST. LAURENT: So that decision was made in 1996 to not pursue the high head option, so it would have been carried through the stage two studies. So the stage two studies would be the study that has the different concepts fleshed out.

THE CHAIRMAN: Thank you. So am I correct that the three -- or maybe not, the high head, option one and option three, the two station, both of those would have impacted Split Lake and increases the water levels there.

MR. ST. LAURENT: That's right. The Birthday sites would have the same reservoir level, they would both have a reservoir of 168.5. So essentially everything upstream of the station on Split Lake would be very, very similar in terms of impacts.

THE CHAIRMAN: Option two wouldn't have impacted Split Lake, it would have flooded maybe 60 percent more than Keeyask, or maybe more, 70 or 80 percent more than Keeyask. Why was it not chosen? It was significantly higher megawattage.

MR. ST. LAURENT: Again, the decision was by the Partnership, where again they

considered the effects of the intermediate head against the low head option, and it was based primarily on the fact that the lower head option would avoid environmental impacts. It's characterizing not a flooded land, but it was viewed that the flooded land is relative to the environmental impacts of that project. So it was in an effort to minimize and avoid environmental impacts.

THE CHAIRMAN: Thank you. My questions might appear to bounce all over the place, but when you come near the end and you're batting clean up, it's just whatever is left over.

On page 56, the excavated material placement areas, and I just have one question. Right outside south of the dykes, more or less a little off right of centre, there's a lake. And it appears that some of this material will be dumped in that lake. Can you tell us anything about that lake and whether this might impact that lake?

MR. ST. LAURENT: So all of these different areas were developed in consultation with the environmental consultants that we work with, aquatics and so forth. And certainly that

would have been reviewed by the aquatic team. And they did not raise issues with putting material on the north side of that lake.

THE CHAIRMAN: Okay, I'll save that question for them.

MR. ST. LAURENT: Yes.

THE CHAIRMAN: I think I just have one left and it's probably simple. You noted, or you stated that the operation workforce, that this station will be staffed 24/7. You said in operations this station will be staffed 24/7.

Now when we were touring the Kettle Station, I'm pretty sure that the manager of the Kettle Station said that overnight and weekends they weren't staffed?

MR. ST. LAURENT: I believe you are right.

THE CHAIRMAN: So some stations are staffed 24/7 and some are not?

MR. ST. LAURENT: The plan for Keeyask at the outset would be to have people there 24/7. It will be designed and constructed in a way where, if down the road there is a decision to remotely control it, it could be remotely controlled in the future. But the plan currently

is that it will be staffed 24/7.

THE CHAIRMAN: Thank you. I'll just see if my colleagues have any questions. Edwin?

MR. YEE: Yes, Mr. Chairman, I do have a question for Mr. St. Laurent.

I believe when you were going over slide 13, which is principal structures, I made a note about that you mentioned something about habitat enhancement. I wonder if you can elaborate a bit on that for me?

MR. ST. LAURENT: Sure, I can do that. So this rendering is a few years old. It's been around for a while. And at the time that this rendering was made, there is no plan to enhance that area. It was, it would essentially be exposed river bed. And since that time, through the environmental studies working group process, the partner communities did express a concern. And I think it was actually as a result of seeing this rendering that they raised concerns with this large exposed river bed area. And that's something that is present at other stations along the lower Nelson. And so they were quite concerned about that lasting effect. And through some discussion and thinking, we have come up with

a couple of options that we have committed to in order to enhance that area.

So in terms of enhancements, we have come up with options. We actually hadn't made a decision as to which option would be implemented. But one option is to enhance that area and develop that area into wetland habitat, so bringing mineral soils into the area, perhaps some of the soils that will be excavated, rather than putting it into the excavated material placement areas they will be placed here. There will be plantings in order to develop wetland habitat.

The other option that is being considered is to develop the area into aquatic habitat. And that would be a bit more expensive. It would require some earth structures to be developed, raising the water levels, creating pools and again bringing mineral soils, new plantings in order to enhance that area.

MR. YEE: Thank you very much.

THE CHAIRMAN: Ms. Bradley?

MS. BRADLEY: Yes, I'd like to just ask a supplement to the remotely controlled. Is the dam, as we understand it, is to have people on site during the working day but not in the evening

and not on weekends, and then it will be controlled remotely, you know, through computers. I guess what I'm looking for is, is that initially, and then it will be fully computerized and controlled remotely? I'm trying to get a sense of what is the future employment situation on site for the proposed dam?

MR. ST. LAURENT: So with respect to staffing the generating station 24/7, I mentioned the number of people that would be there, I believe it was 30 people. Those people would be there typically during the daytime hours only on weekdays. Weeknights and other times of the week, the number of people would be much, much less. I believe it's two people. I could check on that. So the decision to move from staffing it to remotely controlling it would be two people that may or may not be at the station during that operation. So it's not the full 38 people. The 38 people would be there during the day regardless of whether it's remotely controlled or not. That remote control is only during after hours.

MS. BRADLEY: Thank you.

THE CHAIRMAN: Thank you. I think that brings our grilling of this panel to an end.

It wasn't too bad, I don't think. Thank you very much for your presentation and your responses to the cross-examination.

We'll take a break until 3:30. I believe we're ready, or we can be ready for the next panel to go forward? Okay. So we'll come back at 3:30 with a brand new panel.

(Hearing recessed at 3:17 p.m. and reconvened at 3:30 p.m.)

THE CHAIRMAN: We will reconvene. We have the next panel, the regulatory environmental assessment. We will need to swear in the front row, so would you please turn it over to --

MS. JOHNSON: Ladies and gentlemen, would you please state your name for the record.

MR. REMPEL: George Rempel.

MR. EHNES: James Ehnes.

MR. DAVIES: Stuart Davies.

MS. COLE: Vicky Cole.

MR. MANZER: Mark Manzer.

MS. KINLEY: Janet Kinley.

Regulatory Environmental Assessment Panel: Sworn

THE CHAIRMAN: Proceed.

MS. COLE: Okay.

THE CHAIRMAN: Just let me, before you

start, we will continue probably a little past 4:30 so that we can complete this presentation today rather than break it up. Go ahead now.

MS. COLE: Okay. So good afternoon, commissioners and others. As you heard earlier today, my name is Vicky Cole, and I'm the manager of major projects and licensing in Manitoba Hydro. Earlier today you heard from Mr. Keeper and me about the two track approach to undertaking the environmental assessment for the Keeyask generation project.

It is my pleasure to introduce the Partnership's presentation of the regulatory component of the assessment. You will hear about the regulatory component in stages as different topics discuss their component of the regulatory assessment.

Following today's panel, the assessment methodology and findings for each of the specific environments will be addressed by three separate panels; the physical environment will be addressed first, followed by the aquatic and terrestrial environments, and then the socio-economic resource use and heritage resources environment.

Today I will review the overall environmental assessment methodology, that is the overarching approach to undertaking the assessment, including things like scoping and the selection of valued environmental components, determining significance and assessing cumulative effects. Along with my fellow panelists, our intention is to review and summarize the methodology presented in chapter five and seven of the response to EIS guidelines with a focus on some key areas of interest.

Following my presentation today each of the subsequent panels will elaborate further on how the overall assessment methods presented today were applied within their specific study areas. You will learn the approach is consistent throughout, with subject difference to account for the adverse effects being studied. The Keeyask Cree Nations will follow later in the hearings to describe and review their own environmental evaluation reports, and we will conclude with the panel about how the partners will continue to work together on environmental matters during project construction and operation.

I would like to take a few minutes to

introduce you to our panel. I will be acting as panel chair. As discussed earlier today, I have worked at Manitoba Hydro since 2005, and since that time have been engaged on the Keeyask project in a variety of different aspects. I personally have over ten years of experience working on environmental assessments.

With me today is Stuart Davies. Stuart is the president of North South Consultants, and is a key member in developing the overall environmental assessment approach and managing the aquatic component of the assessment. Stuart has 40 years of aquatic and environmental assessment experience and working on the Keeyask project since it began in 1999.

George Rempel who is at the end of the table is a water resources engineer and a principal at StanTec Consulting. George has been involved since the outset in developing the overall environmental approach, project description and assessment. He brings several decades of environmental assessment experience to the project team.

Janet Kinley, who is this end of the table, Janet is a planner and principal of

Intergroup Consultants, and has 34 years of experience in undertaking socio-economic impact assessments. She led the socio-economic components of the assessment.

Dr. James Ehnes, James is the president of Ecosystem, and an ecologist. He has over 16 years of environmental assessment experience. James has the habitat and plants portion of the EIS. His expertise on implementing ecosystem based management principles was instrumental to the project.

And finally right beside me is Mark Manzer. Mark is a colleague of mine at Manitoba Hydro and lead the public involvement program for the Keeyask Generation Project. Mark brings over ten years of experience of environmental assessment, and has been working on Keeyask since he joined our department in 2009.

I will start today by providing some context for the regulatory assessment, including the regulatory environments in which the assessment has been undertaken, and also the Partnership's public involvement program. I will then describe the Partnership's overall EA approach, with a focus on the process for scoping

and selecting valued environmental components, the cumulative effects assessment, the approach to determining significance and the incorporation of climate change considerations in the assessment. I will finish the approach discussion by building on my earlier presentation today with Mr. Keeper, and describe how Aboriginal traditional knowledge was incorporated throughout the regulatory environmental assessment process. This was a very key component of this assessment.

Finally I will wrap up with a short summary. We worked very hard to make the presentation as focused as possible and fully expect that we will explore these themes in more detail through questions raised by the Commission and other hearing participants.

The Partnership filed its Environmental Impact Statement for the Keeyask Generation Project in early July of 2012. The final product submitted by the Partnership represents over a decade of work by a predominantly Manitoba based team of numerous individuals. You will meet and have already met many of them through the course of this hearing, and there is a long list of contributors included

in the assessment documents.

Throughout it has truly been a collaborative process among the entire team. Hydro staff and our consultants working with our partners and their advisors, we view the final product as a major accomplishment. As partners we filed what we believed is a very rigorous assessment of the project in a manner that respects two worldviews, and reflects the knowledge and wisdom of the partner First Nations along with that of scientific researchers.

As Shawna Pachal indicated earlier, the key documents, the Keeyask "Our Story" video, which we all had an opportunity to view at the beginning of the hearing, executive summary and copies of this document are available at this hearing, and we have a Cree translation, the response to EIS guidelines, this is the main document associated with the regulatory assessment and the document we will be talking mostly about with this panel and the next few panels, and the Keeyask Cree Nations environmental evaluation reports, and these specific documents, as we discussed, outline the evaluations undertaken by each of the First Nations partners for their

communities. There is also a number of supporting volumes and additional materials that provide further detail in the information presented in response to the EIS guidelines.

The overall purpose of all of these documents, and really the entire planning and assessment process is to provide the partners and governments with the information they need to make an informed decision about whether or not to proceed with the project from an environmental perspective.

Although the environmental assessment is a regulatory requirement, the Partnership has used the process for its most important purpose, to plan and to design the best project possible.

To meet government requirements, the assessment was undertaken by the EIS guidelines issued by the Federal government and guided us by the government through the Environment Act and the Canadian Federal Environmental Assessment Act. The Federal government, through the Canadian Environmental Assessment Agency, is currently reviewing the project and writing a comprehensive study report for use by Federal ministers in making decisions about whether to issue

authorizations for the project.

To meet Provincial requirements through the Clean Environment Commission process by the Minister of Conservation and Water Stewardship, through this process the Partnership is presenting its work on Keeyask in detail, so as a Commission you have the information needed to make recommendations for the Minister's consideration on the project. (Sound technical problem)

Separate from this Clean Environment Commission process, Manitoba Hydro is also undergoing a review of its prefer development plan through a Public Utilities Board Needs For and Alternative To review. This separate NFAT process includes consideration of Keeyask within that preferred development plan and is the most appropriate place for alternatives to the project and Manitoba Hydro's preferred development plan to be fully considered. In fact, the Province has designed it specifically for this purpose.

Ultimately this partnership is only in the legal position to plan and develop a hydroelectric generation project at Gull Rapids. (sound technical problem). Designing a generation

project that we believe is environmentally and socially acceptable, while being fully aware that the final licensing decisions by the Province will consider the NFAT review and its outcomes.

As partners, we have worked together on the regulatory assessment of Keeyask since formal field studies began in 2001. Field studies and data collection in this area actually began even earlier in 1999. So this equates to over a decade of study before filing the environmental impact statement. As part of a 2001 protocol agreement, and then the Joint Keeyask Development Agreement, the partners have worked through a formal regulatory and licensing protocol, and under this protocol a formal EIS coordination team and a partners regulatory and licensing commitment were established with representatives from all of the partners.

The partners also agreed to establish three topic specific working groups; one for mercury and human health, aquatic working group, and a mammals working group, to review and discuss issues of particular importance to the environmental assessment.

Manitoba Hydro and each of the Keeyask

Cree Nations have also met regularly since 2005 through environmental assessment working groups to review studies and study results as they became available. As I mentioned this morning, all of the partners had the opportunity to review and comment on the EIS documents. With the final review and approval for filing made by Manitoba Hydro and the Cree Nation partners, in the case of each community, this review was undertaken with the help of independently hired advisors with environmental expertise.

Through its public involvement program, or what we often refer to as the PIP, the Partnership has also sought comments and perspectives throughout the environmental assessment process from potentially affected or interested communities and organizations, as well as the general public and regulators. This was and continues to be an integral part of the environmental assessment and planning process for Keeyask. The overall purpose of this program has been to provide Aboriginal and other interested communities and groups with opportunities to share information and perspectives about the project, and its environmental effects. The public

involvement program has been extensive and thorough, providing opportunities throughout Manitoba to participate and provide input.

The map that's up at the moment shows locations in Northern Manitoba where people, community leaders, organizations and groups were invited to participate in the public involvement program between 2008 and 2013. In southern Manitoba open houses were held in Winnipeg and Brandon, and groups and organizations based in the south were also invited to participate in additional public involvement program activities. Public involvement activities have included meetings with chief and councils, municipal leaders and representatives, MKO, and the Keewatin Tribal Council, the KTC, as well as community meetings, workshops or open houses. Over the five years that the public involvement program ran, in excess of 100 groups, communities and organizations were invited to participate.

The public involvement program took place in three distinct stages or rounds that coincided with the timing of the following EIS milestones. Initial scoping and the identification of issues and concerns, then

initial findings of the assessment, and the final EIS document. The three rounds of formal public involvement activities took place between June of 2008 and July 2013 for a total of more than 70 events.

The Partnership also continues to maintain a project website with contact information that can be accessed if individuals wish to provide additional comment. Comments and concerns receive due consideration, and efforts are made to follow up with all participants with a response.

Concerns, comments and questions raised through the PIP process are documented in the EIS filing and subsequent supplemental filings, and a concordance table is provided with the main EIS filing which indicates where these comments have been addressed in the document.

Many key issues have been raised through the PIP process which have helped to shape the content of the EIS, and to inform and confirm what has been studied as part of the environmental assessment process. Among other things, questions and comments have focused on planning and partnership issues, employment training and

business opportunities, concerns about the physical environment, including erosion and sedimentation and changing water levels and flows, the need to protect lake sturgeon population, mercury in fish and the relationship to human health, and concerns about water quality along the entire Nelson River, and especially and drinking water quality.

These themes are very similar to those which have emerged over the past few weeks of the CEC hearings in Northern Manitoba. And over the next few weeks partnership representatives will make presentations that will address the issues and concerns raised, since all of them have been dealt with in some manner in the EIS filings.

At this point however, I do want to comment on the issue of potable water. We have heard from a number of presenters in Northern Manitoba that they believe that Manitoba Hydro is responsible for the issues they are facing with respect to their community's potable water supply. These perspectives are not new to Manitoba Hydro, and similar concerns about potable water have been raised during the Keeyask PIP process, and also by our partners in the Keeyask planning process. It

is important to note that the responsibility for potable water supply in each of the partner communities visited during the northern hearings and elsewhere does not lie with Manitoba Hydro or this partnership. Through Article 6.1 of the Northern Flood Agreement, Canada accepted responsibility to ensure the continuous availability of a potable water supply on each of the reserves that are signatories to the Northern Flood Agreement, and that the quality of the water shall meet the health and safety standards set by Canada to protect the public health. In Article 6.2 of the NFA, Manitoba Hydro agreed that they will provide reimbursement to Canada for up to 50 per cent of its reasonable expenditures to provide this potable water to the reserves, to the extent that such expenditures are attributable to the adverse effects, or the risk of such adverse effects of the project, as it was defined in the NFA. Disputes between Canada and Manitoba about what this means and the costs eligible for reimbursement were resolved almost ten years ago, and Manitoba Hydro has met and is meeting its reimbursement obligations to Canada.

Through the PIP and other existing

agreements, Manitoba Hydro, on behalf of the partnership, has made extra efforts to engage with the Manitoba Metis Federation and the Cross Lake First Nation, or Pimicikamak Okimawin. This has been done as part of ongoing efforts to strengthen our relationships with these groups.

The Manitoba Metis Federation and Manitoba Hydro continue to meet to explore the interests of its members in the project area. To respect protocols established by the MMF, Manitoba Hydro has worked directly with the MMF head office for formal PIP processes, rather than MMF locals in the Keeyask region. The organization participated in round one of the PIP, declined participation in round two, and never formally responded to invitations and special arrangements made for participation in round three. In 2009, Manitoba Hydro and the MMF signed a protocol agreement to create a forum for reviewing and discussing hydro-related issues, including future developments like Keeyask. As part of this process, the MMF was provided funding to develop a work plan and budget to undertake its own studies related to Keeyask. Despite the best efforts of both parties, it took more than 30 meetings over

several years before an agreement was reached in June of 2013, and a work plan to undertake a Metis specific traditional land use and knowledge study, a socio-economic impact assessment and historical narrative for the Keeyask region. These studies will build upon relevant information already collected and documented by the Partnership in the EIS, and in responses to information requests. The Partnership is committed to reviewing and discussing the outcomes of these studies with the MMF so it can determine how best to address any new information.

Manitoba Hydro has also worked with Pimicikamak since 2001, when it notified the First Nation of its intention to prepare plans for future development at Gull Rapids. Under article 9 of the Northern Flood Agreement engagement has included discussions on the general project description, a review of project effects, and a review of potential opportunities for training, employment and business.

The community has also received the PIP presentations developed for rounds one, two and three of the PIP, and efforts are under way to organize a site visit for Pimicikamak

representatives. Unfortunately we have had to postpone this twice; once last summer due to forest fires, and in September due to bad weather. We are still working on it, and plan for the spring.

Discussions have been ongoing with Pimicikamak since 2012 about a resource study. In January of 2012, Manitoba Hydro, on behalf of the partnership, proposed a resource use studies as part of its efforts to better understand potential effects of the project. Pimicikamak declined the proposed work plan initially put forward by Manitoba Hydro, and funding was provided to Pimicikamak to prepare its own detailed work plan and budget for consideration. In early September of 2013 Pimicikamak provided Manitoba Hydro with its study proposal. This proposal is currently being reviewed and discussed by Manitoba Hydro and Pimicikamak, and if it is undertaken, as with the MMF studies, the information generated will contribute to that already documented by the Partnership in its EIS filings.

As well, through its ongoing discussions with Pimicikamak about the project, Manitoba Hydro on behalf of the partnership is

committed to reviewing and discussing any new information that becomes available so it can determine how best it can be addressed as part of project planning and development.

We are very pleased to share the results of our assessment and look forward to engaging in meaningful discussion with the Commission and hearing participants and to explain our findings; the extensive mitigation works we have planned, the proposed environmental protection program; and how we will work together as partners to implement this project in a diligent and responsible manner.

I'm going to take some time now to describe and walk through the main methods used by all of the discipline areas in undertaking the regulatory environmental assessment. As I indicated earlier, each of the disciplines will indicate how they applied the methods, and talk about particular methodology as part of panel presentations in the traditional, terrestrial and socio-economic environments. This diagram represents the full environmental assessment process. It is an approach that provides a full cumulative effects assessment for the Keeyask

project. There are many important parts. So I would like to take some time to walk you through it sequentially.

But before I do this, I would like to address a comment raised by Mr. Williams on behalf of the Consumers Association in his introductory remarks yesterday. Mr. Williams questioned why the Partnership did not have a cumulative effects panel. Well, the answer is simple, cumulative effects assessment is woven throughout the Environmental Impact Statement. We do not view it as a stand alone topic.

The panel here today will discuss the methods used by the Partnership to consider cumulative effects through the regulatory assessment. Topic specialists in subsequent panels will tell you the results of their assessment based on these methods for each of the valued environmental components discussed in the EIS. Cumulative effects are also embedded in the Cree worldview, and you will hear directly from our partners about the results of their environmental evaluation processes.

So, back to the regulatory environmental assessment process, and the main

methods used to complete the regulatory assessment. The first step in this process is defining the project description, and you heard in an earlier panel a full description of the project and construction measures. We just finished talking about it.

Next in the process is scoping and the selection of valued environmental components, or VECs. And I will slip between VECs and VECs, and it is the same thing and I apologize if I use both. Consistent with the EIS guidelines and standard environmental assessment practice, VECs and related study regions were collected to focus the assessment and to assist both the Partnership and decision makers in determining key project effects. In total, 38 VECs were selected for the Keeyask environmental assessment. And I will provide more details on scoping and VEC selection after we sort of walk through the EA process.

In the effects assessment stage, the historic context of the VEC and its current state is described, along with changes to the VEC resulting from the Keeyask project. Proposed mitigation measures were developed to address the anticipated effects from the Keeyask project. We

are showing the mitigation phase as one step here in the process, but it was actually a very iterative process, where the project design was continuously being refined as new information was obtained. After all the mitigation had been developed to offset anticipated effects, the remaining or residual effects of Keeyask were identified and characterized.

The residual effects of Keeyask were then carried through to the significance assessment. The EIS guidelines require that the regulatory assessment make a determination regarding the significance of the project's residual adverse environmental effects. The process to evaluate significance involved an initial evaluation of the direction of the effects, that is whether the effect was adverse, positive or neutral, along with magnitude, duration and geographic extent of the effect. For some effects, additional significance criteria were also applied. These were frequency, reversibility and social and ecological context to provide more certainty in the significance determination. And I will elaborate more on the details for the process of determining

significance later in this presentation.

Residual effects were also evaluated with respect to sensitivity to climate change. Essentially each discipline looked at their specific effects assessment to determine if the conclusion would change in light of potential future climate conditions. And we will also discuss climate change in more detail as we work through the presentation.

So if the residual effects were neutral or positive, a final conclusion was made on the expected effect on a VEC and monitoring and follow-up were proposed related to those effects. If, however, the significance evaluation found that a residual effect of Keeyask was adverse, it was carried through to the second stage of the effects assessment, that is the future activities portion of the cumulative effects assessment. In total 28 of the 38 VECs were deemed to be adversely affected by the Keeyask project and were subject to this additional analysis.

Essentially the same assessment process was applied again, but taking into account the possible effects of potential future activities in combination with Keeyask, expected

residual adverse effects, mitigation measures were reviewed again and in some cases additional mitigation was proposed. The significance determination for that effect on the VEC was re-evaluated to come up with a final conclusion.

The Partnership worked very hard to develop mitigation measures to avoid significant adverse effects that could potentially result from Keeyask.

That takes us through the general process for evaluating environmental effects, but I would like to provide you with some more detail on the various steps that made up the process. I would like to begin with scoping and the selection of valued environmental components. As I noted earlier, VEC selection was required in the EIS guidelines to focus the assessment and to assist the Partnership and decision-makers in determining key project effects. The selection of VECs was an iterative process that involved a lot of communication and research to identify the appropriate key components for refining the assessment. For Keeyask, VECs were selected based on input from a variety of sources, including our partners, experts, concerns and comments raised in

the first round of the public involvement program, and regulators.

An initial list of potential valued environmental components was created and considered by the Partnership. From these, VECs were collected based on a typical list of collection criteria that focuses on things that are important to people and to the environment. The selection criteria included overall importance or value to people, and this was determined through consultations with our partners, local communities and the public. Whether a component was key for ecosystem function or umbrella indicator, and these two criteria identified components that are important ecologically. Whether or not a component is amenable to scientific study was also considered, especially whether change can be measured for the pre and post project environments. Some components of the environments are simply easier to quantify and monitor, and more amenable to indicating change in the future. For the purpose of assessing the project and for long term monitoring, it is appropriate to place an emphasis on those VECs that can be studied and measured in both the

current and future environment.

We also considered whether there was a potential for project effects on a component as part of determining whether it should be a valued environmental component. This basically makes the link between the possible VEC and the project, and to keep the scope focused on things that could actually change as a result of constructing and operating Keeyask.

And finally we considered regulatory requirements. This looked at whether a component should be considered a VEC because of a legal designation, guideline, or authorization requirement. For example, some species that are listed under the Species at Risk Act, like common night hawk, provide an example of environmental components that became VECs in part through this criterion.

The final VEC list was shared with regulators and other interested parties for their comment, and some adjustments were made based on this review process. In total 38 VECs were selected for study as part of the Keeyask environmental assessment. Five aquatic, 13 terrestrial, and 20 socio-economic. Supporting

topics were also developed, which I will discuss shortly.

You will notice that I did not mention any physical environment VECs. The Partnership considered changes in the physical environment due to the Keeyask project to be reflected in the resulting effects to the aquatic, terrestrial and socio-economic VECs. Since without a change in the physical environments, things like erosion and water levels and flows, there would be no changes in other aspects of the environment. So for this reason changes to the physical environments are intermediary effects that eventually and ultimately affected other environmental components, and this will be discussed in more detail as part of the physical environment panel.

Throughout the EIS the partners have adopted a VEC based approach that focuses on VECs as indicators for the overall state of the aquatic, terrestrial and socio-economic environments. In order to do this, it was also important to have a full understanding of the environment that supports each VEC. So while the assessment focused on VECs, components of the

environment that support these VECs, for example, aquatic habitat that supports fish populations were also studied, as were other important components of the environment that had the potential to be affected by the project, like amphibians. These additional components called supporting topics were studied to provide greater insight into the nature of potential effects on VECs and to improve the reliability and completeness of the assessment.

Throughout, efforts were consistently made to review and assess these VECs individually and as part of the eco-system in which they are found. In short, the VEC approach required by the EIS guidelines and provided in the EIS, examined how everything is connected, how environmental components are linked together and how effects of the Keeyask project can flow through these links to impact several different VECs.

Study areas were also collected for analysis for individual VECs to reflect differences inherent to each of the VECs, and potential pathway effects from the project. Local study areas were designed to capture the direct effects of the project during construction and

operation, and a larger regional study area was designed to capture broader regional effects. Each of the disciplines will discuss the selection of each of the study areas for their VECs as part of their presentations.

I would now like to describe how the regulatory assessment and the work undertaken by the Partnership reflects the best practices for cumulative effects assessment outlined in the Cumulative Effects Assessment Practitioners Guide published by the Canadian Environmental Assessment Agency, and in comments provided by the Commission in its report on the Wuskwatim generation project, and again in the Commission's most recent report on the Bipole III project.

In the EIS guidelines issued for the Keeyask project, the Partnership was encouraged to use the Cumulative Effects Assessment Practitioners Guide for guidance for undertaking its cumulative effects assessment. This guide notes, and the Partnership agrees, that cumulative effects assessment is environmental assessment as it should always have been; an environmental impact assessment done well. The guide goes on to note that in practice the assessment of cumulative

effects requires consideration of some concepts that are not always found in conventional environmental assessment approaches.

In this regard the guide notes on page 3 that cumulative effects assessments are typically expected to assess effects over a larger area that may cross jurisdictional boundaries. Assess effects over a longer period of time into both the past and the future. Consider effects on Valued Environmental Components due to interactions with other actions, and not just the effects of a single action under review. Include other past, existing and future actions, and evaluate significance in consideration of other than just local, direct effects.

In its report on the Wuskwatim generation project the Commission echoed the comments made in the Practitioners Guide, noting that a high quality Cumulative Effects Assessment would assess effects over a larger or regional area that may cross jurisdictional boundaries, assess effects during a longer period of time into the past and future, consider effects on VECs due to interactions with other actions and not just the effects of the single action under review,

include other past existing and future reasonably foreseeable actions, and evaluate significance in consideration of other than just local direct effects.

A very similar set of recommendations on Cumulative Effects Assessment is made in the Commission's Bipole III report, which was completed after the Keeyask EIS had been filed. In this report, the Commission outlines a set of acceptable practices for Cumulative Effects Assessment as follows: Assess effects in close vicinity to the project as well as in the regional context; assess effects during a longer period of time into the past and future; consider effects on VECs due to interactions with other actions, and not just the effects of the single action under review. In evaluating significance, consider other than just local direct effects, and include all past, current and reasonably foreseeable actions.

The Partnership did take note of the Commission's Wuskwatim comments on the requirements for a high quality Cumulative Effects Assessment. These were available at the time of developing the Keeyask EIS methods and writing the

assessment, as well as the steps outlined in the Cumulative Effects Assessment Practitioners Guide recommended for use in the EIS guidelines. We will now indicate how the Partnership has met these requirements through its overall environmental assessment approach.

Understanding the current state of each VEC is based on the understanding of how it has been affected by past and current projects and activities. This starts with the historical context. For each VEC the EIS provides a historical context and describes the effects of past projects and activities. How far into the past this assessment goes depends on the VEC and what is considered to be most appropriate to understand how a VEC has changed over time, and the fact contributing most to the current state of that VEC. For the most part this description of context extends back at least as far as the start of hydroelectric development in the Lower Nelson region, and in some cases even further back in time. For example, the ecosystem diversity assessment extends as far back as pre-industrial development. Terrestrial losses from roads, settlements and permanent infrastructure were

quantified from historical photos and other available information. The projects and activities considered as part of understanding the past are documented in the EIS, and in the cumulative effects summary filed by the Partnership. They generally include three categories of activities, Manitoba Hydro generation related developments, linear development in the region, for example, roads and transmission lines, and other development like mining, forestry, commercial resource use and government policy.

An understanding of these effects is the beginning of the partnership cumulative effects assessment. Wherever feasible, the changes that have occurred over time are presented quantitatively. However, this is not always feasible because earlier developments were built at a time when rigorous environmental assessments were not yet required in Manitoba. This means comparable pre-development data, for example, prior to the construction of Kelsey or the implementation of the Lake Winnipeg Regulation project and the Churchill River Diversion project are simply not available for many VECs. In such

cases, where it is not possible to quantitatively describe the historical changes that have occurred, a detailed qualitative description has been provided based on historical records, previous studies, and most importantly Aboriginal traditional knowledge. This is the case, for example, for lake sturgeon, where it is well known that stocks have declined dramatically as a result of commercial overharvest and hydroelectric development. Population estimates for the Lower Nelson around the early 1900s and later are not known exactly, but the general size and character of this population can be described based on catch data evidence in the historical record and the traditional knowledge of those who live in the area.

Historical data have also been used in this regard to understand how each VEC has responded to previous developments, and the success or not of previous mitigation measures, including mitigation in other regions. For example, the Nelson River Sturgeon Board has undertaken lake sturgeon stocking efforts in the upper Nelson River since the 1990s, when the species was thought to be completely gone from the

area. Subsequent studies to assess the outcomes of the stocking indicates it is having a positive effect on the lake sturgeon in this area, and that stocking can be a valuable mitigation tool in the Nelson River.

Similarly an analysis of the Stephens Lake reservoir following the development of Kettle has indicated that caribou calving islands have been created in this reservoir, and given the similarity of the terrestrial environment at Keeyask, it is considered feasible that these types of calving islands will be created once Keeyask is developed.

Having established historical context, the EIS goes on to describe the current state of each VEC and anticipated future trends. The current state of each VEC represents the environment in which the project is being developed. Understanding the current state of the environment in detail is critical to understanding the incremental cumulative effect of developing Keeyask.

Ultimately the role of environmental assessment is to understand the difference between what the local and regional environments would be

like with and without the project in place.

An understanding of historic and current conditions and any trends that may be occurring is then used as a basis for assessing the effects of Keeyask on each VEC and for related supporting topics.

The effects assessment is based on the past and current projects and activities. The incremental effect in combination with past and current projects and activities; this component of the assessment provides an indication of the incremental effects of Keeyask on each VEC acting in combination with past and current projects and activities. Consideration has been given to effects during both the construction and operation phases, and in most cases analysis during operations extends at least 30 years in the future, and in some cases qualitative assessment extends up to 100 years. So for each VEC this means that the assessment considers a time frame extending from pre-hydroelectric development in the region to a period 30 to 100 years in to the future. Science provides a snapshot in time, while Aboriginal traditional knowledge provides the long time view. This time frame is a

considerable amount of time, and it is consistent with the Commission's recommended best practice.

There is certainly no doubt that a project of this size has the potential to create significant adverse effects. The Partnership has worked very hard to address this possibility. As the potential effects of Keeyask were identified for each VEC, efforts have been made to determine whether mitigation is possible to avoid or minimize adverse effects and whether enhancements are available to improve project benefits. Sometimes this has meant changes to the overall project description. In other cases it has meant the implementation of additional project specific mitigation on enhancement.

Now, as we have heard through several presentations in many cases earlier, decisions about the project contributed substantially to these improvements. For example, the decision to proceed with the low head design that considerably reduced environmental effects; the decision to involve the Keeyask Cree Nations as partners in the development and negotiated employment preference agreements, in the Burntwood development agreement. The process has been

iterative throughout. The process has become more defined, and result of studies has clear indication about possible effects. For example, and Marc touched on this briefly, processes were undertaken by the Partnership to assess alternative ways of developing project components like access roads, with a focus on selecting options with the fewest adverse environmental effects.

Detailed work has also been undertaken to minimize unavoidable adverse effects as much as feasible through mitigation measures such as sturgeon stocking, the development of fish habitat, and the creation of new wetlands. Our partners have also identified and negotiated numerous offsetting measures through the Cree worldview and experience with past developments. All of this is captured in the mitigation step of the assessment.

In a few cases, and most notably for sturgeon, mitigation measures go beyond simply addressing the adverse effects of Keeyask and have been designed to also enhance the current state of the VEC. Sturgeon populations in the Kelsey to Kettle reach of the river are very low, and the

current low numbers are limiting the potential for recovery, and in some areas, notably Stephens Lake, it is unlikely that the population is presently self-sustaining. To address this existing condition and the incremental effects of Keeyask, the Partnership has committed to a large scale stocking program to bring back a self-sustaining population of sturgeon in this reach of the river.

So all of this is to say that while the four residual effects and significance are determined, the Partnership went through an iterative process of identifying and developing measures to avoid or reduce adverse effects and enhance positive effects. For many environmental parameters like wetlands, this lead to large reductions in potential adverse effects of the project.

Having identified avoidance mitigation and enhancement measures, the next step is to determine residual effects and undertake an assessment of their significance. Residual effects are those effects expected to remain after mitigation enhancement have been applied. Residual effects at this step reflect the

incremental cumulative effect of Keeyask on each VEC acting in combination with past and current projects and activities. Under the EIS guidelines provided by regulators, the Partnership was asked to assess the significance of adverse effects on VECs consistent with criteria outlined in the guidelines. The conclusion of the residual effects assessment and findings of significance were also assessed to determine their sensitivity to climate change. In a moment I will explain the approach used by the Partnership specifically related to these two components.

The determination of regulatory significance and a consideration of climate change. Before I do this, I wanted to note that all the VECs expected to experience residual adverse effects from Keeyask, acting in combination with past projects and activities, regardless of the findings of significance, were assessed further to determine if there are likely to be additional cumulative effects due to overlaps of Keeyask effects with the effects of other potential future projects and activities. In other words, we also looked at potential future cumulative effects. Consistent with the EIS

guidelines, only residual adverse effects were assessed in this manner. Residual positive effects did not undergo further analysis. In total 28 of the 38 VECs received this additional cumulative effects treatment. The future projects considered focused on certain and reasonably foreseeable projects and activities. This is consistent with the EIS guidelines, the Canadian Environmental Assessment Agency Operational Policy Statement on Assessing Cumulative Effects, and the Federal Guidance Document for Assessing Cumulative Effects. The Partnership considered certain projects to include those already well advanced in the planning process at the time the EIS was written, for instance the Bipole III project.

Reasonably foreseeable projects were considered to be those projects likely to proceed, even though formal regulatory applications where relevant may not yet have been made, so for example, the proposed Conawapa generation project. These definitions for certain and reasonably foreseeable projects are consistent with those provided in the Practitioners Guide issued by the Canadian Environmental Assessment Agency and other guidance documents.

Following consideration of possible cumulative effects of Keeyask with future projects, a review of mitigation was undertaken to determine if it continued to be appropriate. In most cases the mitigation was considered to be sufficiently robust, but in a few cases additional measures were implemented. For example, in the case of worker interaction and public safety, it became very clear that with the number of projects to be undertaken in the Gillam area over the next 20 years, and especially the next 10 years, that a more comprehensive approach to addressing possible cumulative effects was required. This lead to a creation of a worker interaction committee in Gillam, with representatives of the town, Fox Lake, Manitoba Hydro and relevant service providers to work together to determine the best response to these possible effects and how best to monitor potential outcomes.

Following the cumulative effects assessment, the significance of the residual adverse effects of Keeyask were also re-evaluated and a final conclusion about the effects to that VEC was determined. Following completion of the environmental assessment, the Partnership

developed a comprehensive monitoring and follow-up program to identify actual effects of the project and to determine the effectiveness of mitigation measures. This is shown in the diagram up at the moment, at the very end by the monitoring and follow-up box. This monitoring and follow-up program focuses on the state of individual VECs, and if required, allows for adaptive management measures to be implemented. So it is also an iterative process where the monitoring are constantly being valued and reviewed, mitigation and management measures applied as required. The specific monitoring programs for each discipline will be discussed by the specialists as they present the results of their components of the assessment.

The final partnership panel will outline how the partners will work together on these environmental matters during the course of project construction and throughout the life of project operation. So this VEC based approach appropriately took into account the effects of past, present and where required, future projects, in determining the incremental cumulative effects of Keeyask.

The Partnership also looked as far back into the past as appropriate for each individual VEC for past effects and the current state of VECs. It assessed up to 30 years in the future, and in some cases qualitative assessment extends up to 100 years in the future. Looking forward, the cumulative effects assessment also considered certain and reasonably foreseeable projects, with consideration given to both the construction and operating period of these future projects.

This VEC based approach has also meant that the study area selected for analysis are based on each individual VEC, with consideration given to both local direct effects of the project and lists potential regional effects, another of the best practices noted by the Commission. For example, each terrestrial VEC is assessed based on effects in a local study area designed to capture the direct effects of the project during construction and operation, and then within a larger regional study area to capture larger regional effects at a population and regional eco-system level. A similar approach has been taken for the aquatic effects, specific

characteristics relevant to each VEC.

Significance has also been determined for the cumulative incremental effect of Keeyask, first in combination with past and current projects and activities, and then again based on the potential for Keeyask effects to overlap with those of future projects. It has been done for each VEC that is impacted by Keeyask based on a consideration of all potential factors affecting a VEC at a regional level, and not just those factors resulting from the project. This complies with the CEC comment in the Wuskwatim report for a high quality cumulative effects assessment. That is evaluate significance in consideration of other than just local direct effects.

I would now like to turn to the significance methodology and elaborate on the process undertaken by the Partnership to evaluate what we decided to call regulatory significance. The term regulatory significance was developed in discussion with our partners. And it simply refers to the analysis of significance based on the requirements set out in the Canadian Environmental Assessment Act, and in the EIS guidelines. It is intended to distinguish

regulatory significance as specifically required by the EIS guidelines, from the every day common use of the term. The EIS discusses significance methodology in terms of a two step approach. Based on the information requests from participants, it is clear that this description has created some confusion, and so I would like to take a few minutes to better explain this approach. So another flow chart to explain it. For each VEC an initial assessment of significance has been undertaken by considering the four criteria of direction, magnitude, duration and geographic extent. So is the effect positive, adverse, how big is the effect, how long is it expected to last and how large an area will be affected?

An understanding of these criteria for each VEC provides a strong indication of the potential for their to be a residual adverse effect that is significant. If the initial analysis indicates that an effect is positive or neutral, no further analysis was undertaken. If it is determined that there is no real potential for residual adverse effects on a VEC to be significant, then the effects are deemed not

significant with a few exceptions discussed momentarily, and no further analysis is undertaken. If there was any potential for there to be a significant residual adverse effect, then the additional criteria of frequency, reversibility and ecological social context were also examined. These criterias look at how often an effect on a VEC is expected to occur, the reversibility of a VEC and the sensitivity of a VEC to change, and whether it has the capacity to adapt to change. There are also certain circumstances where even though the initial assessment suggested little potential for a significant adverse effect because of the nature of the VEC or the level of uncertainty associated with the analysis, the additional three criteria are examined any way to improve confidence in the findings.

A good example are species listed as species in danger at the time that the EIS was written. In all such cases, a full set of criteria were examined because the already vulnerable state of these VECs means that even small changes could be significant. Once all of the parameters were considered, a determination

was made regarding the significance of adverse effects. This process was iterative and additional mitigation was applied as needed. The end result is that Keeyask is not expected to have significant adverse effects.

Where available, the EIS committed to the use of an established national and provincial threshold and guidelines to evaluate significance. A threshold is typically defined as a limit of tolerance of a VEC to an effect that, if exceeded, results in adverse response by that VEC. The EIS assumed that established thresholds or guidelines would be specific levels defined by governments or planning authorities established by governments, or generally accepted scientific threshold. Based on this criteria, the EIS was not able to identify any specific established thresholds for any VECs, although government guidelines were identified and used where applicable. For example, Manitoba surface water quality guidelines, as well as various government guidelines related to allowed mercury concentrations for fish used in human consumption.

Assessment of project effects on socio-economic VECs takes into account any

available planning or established guidelines or requirements that may apply. For some VECs, however, like worker interaction or human health, the assessment focuses on ensuring that all reasonable mitigation and adaptive management measures are considered and adopted where feasible, and no attempt is made to suggest that the EIS can or should identify an acceptable level of an adverse effect or risk.

In the absence of established thresholds and where guidelines were not available for a VEC, and it was possible or reasonable to do so, the Partnership used benchmarks against which to measure projects effects and to assess significance. As used in the EIS, benchmarks are values set below the range of what a specialist or government regulator believes are the thresholds for significant change in a VEC. In such cases there may be insufficient information to define a specific threshold, but the information that is available is considered to be sufficient to set out a benchmark level which is considered to be well below any likely threshold. Benchmarks are particularly relevant in the assessment of terrestrial VECs. Benchmarks are intended to be

precautionary and represent a level of disturbance where additional mitigation and care is likely warranted.

Some of the benchmarks in the EIS have already been established by regulators, for example, Environment Canada has indicated that undisturbed regional habitat for a boreal Woodland caribou should not fall below 65 per cent of a regional area. This value has been used in assessing significance of effects on caribou herds using the Keeyask region.

Other benchmarks have been set by the terrestrial study team based on what the specialist believes represents a reasonable level of caution. For example, the benchmark for disturbance of priority plants, those plants that are rare or a particular interest in the region, has been set at 10 per cent of the regional study area.

As effects approach the benchmark value, additional mitigation and management levels are considered and careful attention is paid to develop monitoring programs that are able to detect change.

Climate change is a topic of interest

for Manitoba Hydro, our partners, regulatory agencies, and based on the information requests, hearing participants. In undertaking its analysis with respect to climate change, the Partnership considered CEA guidance in how to incorporate climate change considerations into an environmental assessment. In general, the EIS considered three aspects of climate change; the first was the effect of the environment, including climate on the project. This was a requirement of the guidelines. In essence this involved assessing the robustness of the process design and operations to possible climate change. The next aspect was the effect of the project on the environment. This was also a guideline requirement. For this a detailed life cycle analysis was undertaken for the Partnership by the Pembina institute that considered construction, land use changes, operation and decommissioning. Details of the life cycle analysis will be discussed as part of the physical environment panel.

The last aspect which I did reference previously, was a sensitivity of the effects assessment to climate change. This was not a

requirement of the guidelines but was done by the Partnership as a matter of due diligence. For this sensitivity analysis, future climate change scenarios for the Keeyask region were developed based on international guidelines and modeling practices for each aspect of the assessment. The sensitivity of assessment based on climate change based on these climate change scenarios is analyzed and discussed. Specific details of these scenarios and their development will be discussed as a part of the physical environment panel.

So how is all of this captured in the EIS? Well, chapter 5 of the response to EIS guidelines describes the overarching methodology for the environmental assessment. Chapter 6 provides information on historical and current context, and the incremental cumulative effects of the Keeyask project for each VEC. It also documents mitigation measures and outlines residual effects and the significance of residual adverse effects for these VECs. It documents the sensitivity of effects to climate change. Chapter 7 considers the incremental cumulative effects of Keeyask, acting in combination with planned and reasonably foreseeable future projects, and

determines whether the assessment of significance made in chapter 6 changes due to the potential effects of future projects. Chapter 8 presents details of the proposed monitoring and follow-up program, and this has been enhanced considerably through the filing of the partnership through an environmental protection program. And chapter 3 of the filing presents the processes and outcomes of the partnership's public involvement program. Additional information to support these is provided in the supporting volumes.

Mr. Chair, I know you were sensitive to time. I have no idea what time we are at, but if you would like to break, this is a spot where it probably would be reasonable to break for the day.

THE CHAIRMAN: It is 4:45, so perhaps we should, if this is -- we are changing direction a fair bit here, so perhaps we should take a break at this point. Before we do break, though, I have a couple of questions of you Ms. Cole. Is this the only presentation that we will be receiving from the Partnership on both PIP and cumulative effects?

MS. COLE: This is certainly the only

presentation that you will be receiving on the PIP, and this is certainly the panel where I recommend that you ask any questions you may have on the public involvement program. In terms of the methodology for cumulative effects assessment, yes, this is the panel where it will be presented. Other panels will present the findings of implementing that approach.

THE CHAIRMAN: Okay. Thank you. Then before we adjourn, Madam secretary, you have some exhibits to file.

MS. JOHNSON: I certainly do. KHLP number 35 is the IHA audit draft. And number 36 is the two track assessment approach presentation. Number 37 is the project description presentation. 38 is the map book that goes along with that presentation, and 39 will be this presentation.

(EXHIBIT KHLP35: The IHA audit draft)

(EXHIBIT KHLP36: two track assessment approach presentation)

(EXHIBIT KHLP37: The project description presentation)

(EXHIBIT KHLP38: Map book)

(EXHIBIT KHLP39: Approach, methods

and processes presentation)

THE CHAIRMAN: Thank you. I don't believe that we have any other business, so I will resume tomorrow morning at 9:30 with the same panel in the hot seat.

(Adjourned at 4:45 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.