Keeyask Generation Project

Environmental Overview

KEEYASK
Hydropower Limited Partnership

2014 - 2015

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Councilor Nathan Neckoway
Councilor Alwyn Keeper

War Lake First Nation

Councilor Thomas Nepitabo
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KEEYASK

Hydropower Limited Partnership

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Message from the Chair of the General Partner of KHLP

The Keeyask Hydropower Limited Partnership (KHLP) is pleased to present the Keeyask Generation Project (the Project) Environmental Overview. The KHLP is committed to constructing and operating the Project in a way that supports economic development, minimizes effects on the environment, and safeguards human health.

An Environmental Protection Program made up of three different types of plans – Protection Plans, Management Plans and Monitoring Plans – was developed by the KHLP to mitigate, manage and monitor environmental effects during construction and operation of the Project.

Manitoba Hydro and the partner First Nations worked together to plan and obtain regulatory approvals for the Project by using an assessment approach that placed equal value on information gained through technical science and Aboriginal Traditional Knowledge (ATK). The Environmental Protection Program is designed to continue this approach. Consistent with the Joint Keeyask Development Agreement (JKDA), Manitoba Hydro is undertaking the technical science monitoring program on behalf of the KHLP and each of the partner First Nations will implement its own monitoring program.

This Environmental Overview is a public document that summarizes the results of the Environmental Protection Program. Separate technical reports on the results are filed annually with regulators according to the terms and conditions of *The Environment Act* Licence issued for the Project. Both the Environmental Overview and regulatory reports are available on the KHLP website: www.Keeyask.com. The KHLP also produced *Monitoring Overview* summarizing the results of the Environmental Protection Program for the recently completed Keeyask Infrastructure Program, and a *Year in Review* document that outlines the major accomplishments related to construction of the Project.

The KHLP is committed to carefully mitigating and monitoring the anticipated environmental effects experienced during the construction and operation of the Project. The KHLP has also developed a flexible and robust adaptive management program that allows the partners to identify and address any unanticipated effects in a timely and comprehensive way.

Sincerely,

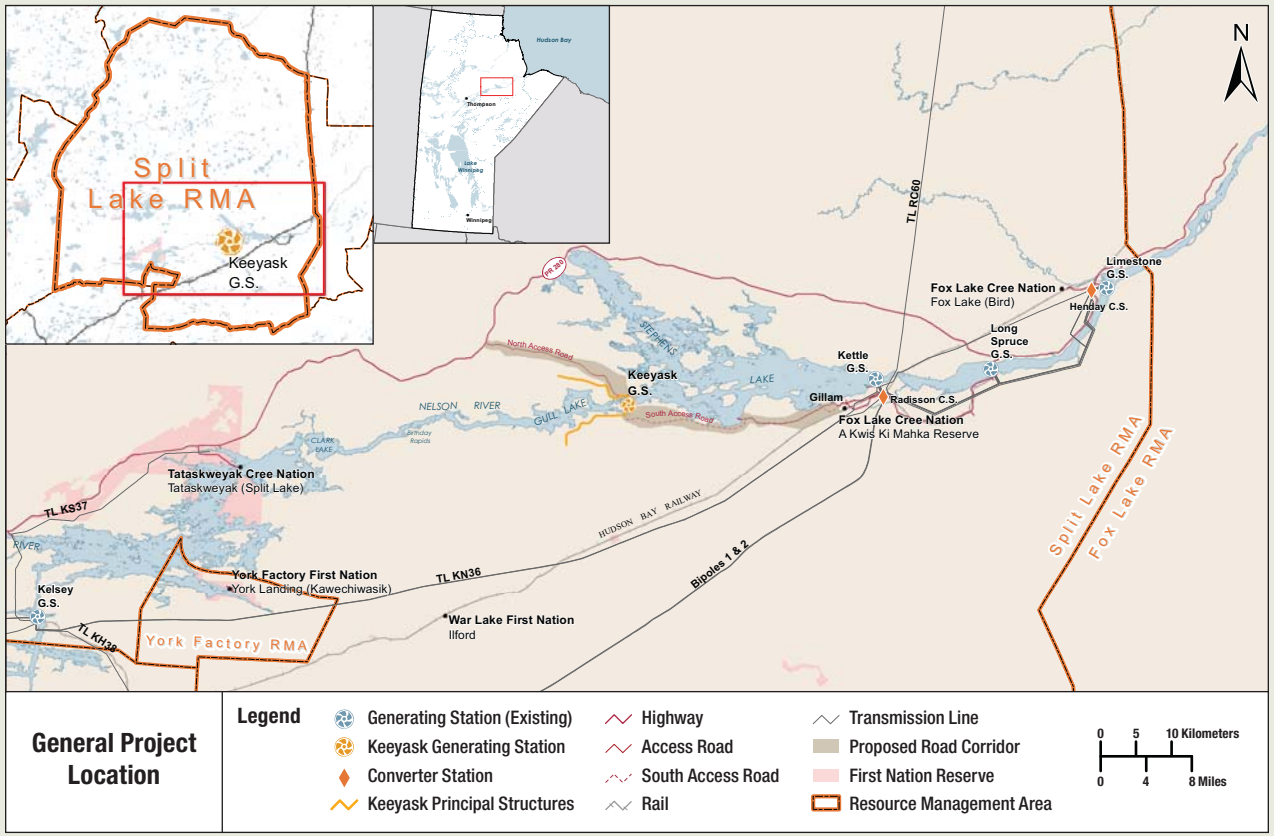
Ruth Kristjanson
Chair of the General Partner of Keeyask Hydropower Limited Partnership
(5900345 Manitoba Ltd.)

Introduction

For over a century, Manitobans have come to rely on hydroelectricity to power their homes, industries and businesses. With abundant water resources, Manitoba is well poised to take advantage of the public's growing demand for electrical energy – both within the province and in export markets. The 695-megawatt Keeyask Generation Project (the Project), now under construction on the Nelson River in northern Manitoba, is one project that will help meet that demand. Keeyask is located within the Split Lake Resource Management Area and will be the fourth largest generating station in Manitoba. It will take approximately eight-and-a-half years to build, with a first unit in-service date of 2019.

Manitoba Hydro and the four Cree Nations referred to collectively as the partner First Nations: Tataskweyak Cree Nation and War Lake Cree Nation (working together as the Cree Nation Partners); Fox Lake Cree Nation and York Factory First Nation, have formed the Keeyask Hydropower Limited Partnership (KHLP) to develop this Project in an environmentally and socially responsible manner. The ongoing development of the Project is guided by the Joint Keeyask Development Agreement (JKDA), which lays out the terms for partnership, ownership, construction, and operation of Keeyask.

Keeyask will be the fifth hydroelectric generating station constructed on the lower Nelson River, within the ancestral homeland of all four partner First Nations. These communities have and continue to be affected by past hydroelectric developments in northern Manitoba that were constructed over the last 50 years. In developing these earlier projects, efforts to inform, consult or involve local communities were much more limited than today and project planning was based on very different understandings of Aboriginal



rights and interests. These earlier projects had a severe impact on the Cree, reducing the capacity of their homeland to sustain them physically and culturally.

Keeyask represents a fundamental shift in how hydroelectric projects are developed in the province of Manitoba. Manitoba Hydro and the partner First Nations have worked together for well over a decade to develop the Keeyask Project and, for the first time in their history, the partner First Nations have had meaningful input into a project. Through various employment and business opportunities, as well as potential income opportunities, the partner First Nations are poised to benefit from a hydroelectric project in their homeland.

Manitoba Hydro and the partner First Nations (the Partners) worked together to plan and obtain regulatory approval for the Project using parallel approaches to environmental assessment that resulted in an Environmental Impact Statement (EIS) based on information gained through technical science and Aboriginal Traditional Knowledge (ATK). Each community prepared a separate Environmental Evaluation Report founded in their Cree worldview. These were submitted as an equal part of the Keeyask EIS.

During the Project planning and design process, the Partners identified mitigation to avoid or reduce the Project's environmental effects and determined what needed to be monitored to verify predicted effects. All of the mitigation and monitoring identified is included in a series of documents called the Keeyask Environmental Protection Program (the Program).

This Environmental Overview will describe the Program and give a summary of what has been undertaken and learned since the start of construction in July 2014 until March 31, 2015. This is the first edition of the Environmental Overview. Subsequent editions will be prepared annually during construction of the Project.

Environmental Protection Program

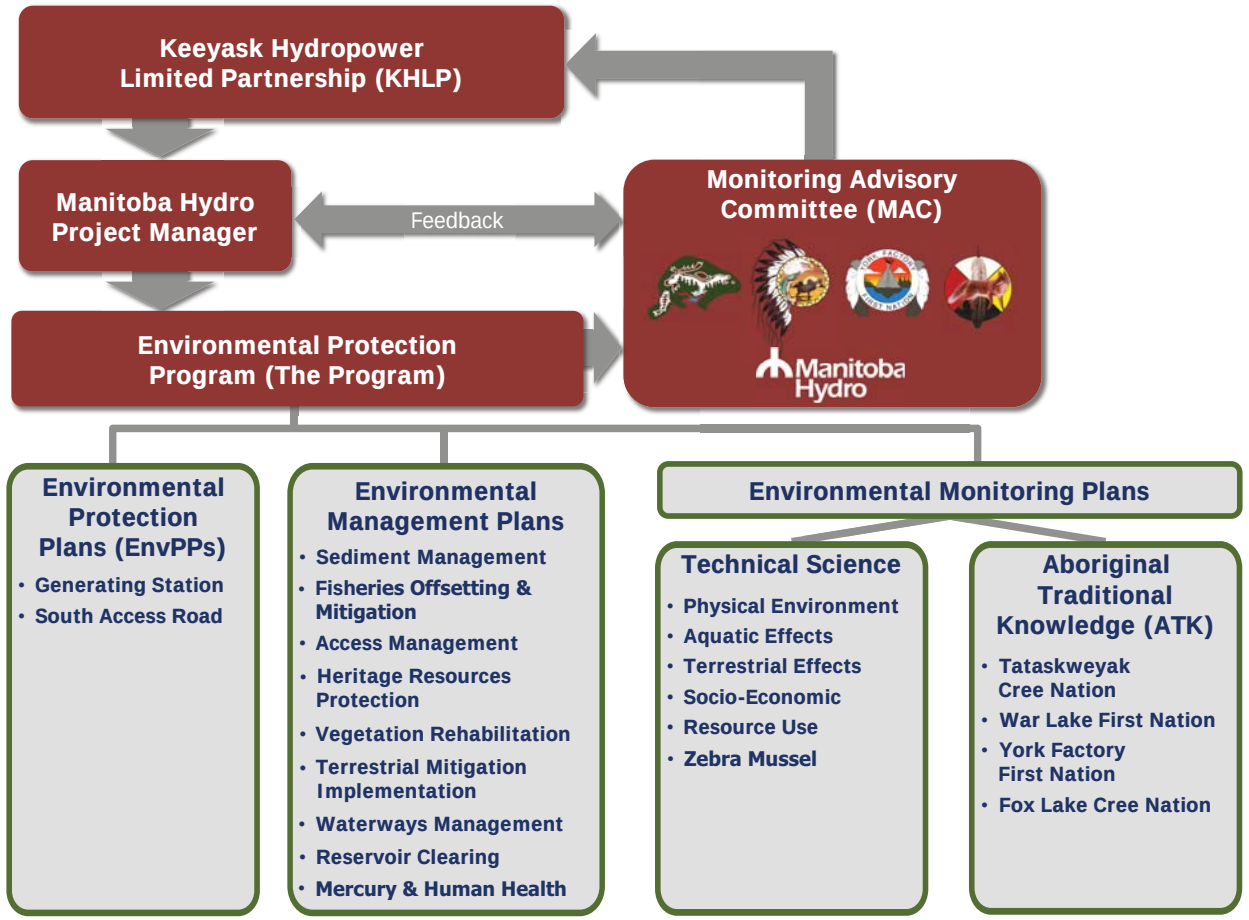
Environmental approvals, including a Manitoba *Environment Act* Licence and a federal *Fisheries Act* Authorization, were issued to the KHLP after a thorough regulatory and public review process. The process included environmental assessment studies, preparation of an Environmental Impact Statement (EIS), and technical reviews and assessments conducted by both the provincial and federal governments. *The Environment Act* Licence was issued on July 2, 2014 and the *Fisheries Act* Authorization was issued on July 15, 2014.

Keeyask's Environmental Protection Program was developed to mitigate, manage and monitor environmental effects, which were described in the EIS, during the construction and operation of the Project. The Program is made up of a number of plans grouped in the following categories:

Environmental Protection Plans – provide detailed, site-specific environmental protection measures to be followed by the contractors and construction staff to minimize environmental effects from construction of the generating station and the south access road;

Environmental Management Plans – focus on specific environmental issues such as sediment management, access management, fish habitat and heritage resources; and

Environmental Monitoring Plans – describe the activities to be undertaken for the monitoring of effects of construction and operational activities on the biological, physical and socio-economic environments.



The Environment Act Licence states that all the environmental plans that make up the Environmental Protection Program have to be approved by the regulator and executed during the Project. Manitoba Hydro is responsible for the environmental protection and management plans and is undertaking the technical science monitoring on behalf of the KHLP. Each of the partner First Nations will be implementing its own community-based monitoring programs.

There is a Monitoring Advisory Committee (MAC), made up of partner First Nations' Members and Manitoba Hydro staff, that is responsible for reviewing and discussing the implementation and outcomes of the Environmental Protection Program. The MAC meets every two months and advises the KHLP on environmental issues.

Generation Project Status

Construction of the Keeyask Generation Project began in July 2014, once *The Environment Act* Licence and the *Fisheries Act* Authorization and other permits were in place. The General Civil Contract, the largest contract on the Keeyask Project, was awarded to BBE Hydro Constructors Limited Partnership. The Keeyask General Civil Contract includes: rock excavation, concrete production for the powerhouse and spillway, earth structures, electrical and mechanical work, and the construction and removal of temporary cofferdams needed to manage river flows during construction.

Construction activities began in the Nelson River at Gull Rapids on July 16, 2014. Since beginning in-stream construction, the primary activity has been constructing the temporary river management structures that divert or redirect the river away from where the permanent structures will be built.

For example, the powerhouse is built in a dry area behind a temporary cofferdam, which holds back the water during construction and is later removed, once the powerhouse is fully constructed and ready for use. The river management structures constructed between the start of construction and March 31, 2015 include the Quarry cofferdam, North Channel rock groin, North Channel cofferdam, Powerhouse cofferdam, and the start of dual rock groins for the Spillway cofferdam.

The location of the Project on Gull Rapids can be affected by ice processes during freeze up. If the ice sheet upstream does not form, chunks of ice begin to pile up at the base of Gull Rapids, which causes the water behind the ice jam to back up into the rapids. This phenomenon could result in the overtopping of cofferdams if water levels get too high. In order to protect against this, an ice boom was designed and installed upstream of the Project site to assist in forming an ice sheet. The structure was anchored to the bottom of the river and consisted of a long line of floats that connected to one another and spanned a large portion of the river. Unfortunately the ice boom was destroyed by the ice during the winter of 2014-2015 and the ice cover did not form upstream from the project site, as planned.

Hauling material for cofferdam construction


Construction of rock groin

Lack of a stable ice cover upstream and unusually high river flows during the winter of 2014-2015 caused ice to build up at Gull Rapids such that water began to back up towards the worksite. The Powerhouse and Quarry cofferdams had to be raised and extended to prevent the backed-up water from overtopping them and flooding the dry work areas. The North Channel rock groin was extended into the south channel of Gull Rapids to promote formation of an ice cover upstream of the site, which would prevent additional ice build up at Gull Rapids and mitigate the high water levels at the construction site.

Upstream ice cover formed in late January and excavation work to construct the powerhouse began. By March 31, 2015, 1.25 million cubic metres of rock had been excavated and hauled from the quarries, intake channel and location of the powerhouse.

The majority of the infrastructure to support the construction of the generating station was completed as part of the Keeyask Infrastructure Project, which began in 2012 and concluded in 2014. The main construction camp houses the majority of the Project's workforce and includes accommodations for 500+ people, a kitchen complex, a gym and recreation centre and an entertainment centre which are all connected by a corridor. Work is still underway to expand the camp by 1,500+ rooms to meet the Project's peak workforce requirements in 2016.

Members of the partner First Nations are currently employed in a variety of construction related positions. As was the case for the Infrastructure Project, partner First Nations' businesses continue to provide important site services including security, employee retention and support, emergency medical services, catering, janitorial, and camp maintenance for the Keeyask Generation Project.

Environmental Protection Plan

Two Environmental Protection Plans, one for construction of the generating station and one for the construction of the South Access Road, were developed to provide detailed environmental protection measures to be followed by contractors and construction staff to minimize environmental impacts during the construction. There is a Site Environmental Lead and six environmental inspectors who conduct compliance monitoring daily to confirm the measures outlined in the Environmental Protection Plans and all regulatory requirements are followed.

Instream Construction

At Keeyask, cofferdams were constructed to cut off the flow of the Nelson River both upstream and downstream of areas where the major components (powerhouse, spillway, central dam and south dam) need to be built. Rock groins have also been installed upstream of where the main components will be built to slow and redirect water flow.

Building cofferdams and rock groins involves placing rock and clay in the water. Construction activities that occur in the water are restricted to specific times of the year to protect fish during spawning and must be approved by Fisheries and Oceans Canada (DFO). All in-water construction activities at Keeyask were approved by DFO before the work started.

Spillway cofferdam construction

Dewatering bag used to slow water down that was being pumped to vegetation

Dewatering of Construction Areas

Dewatering the North Channel of Gull Rapids after the cofferdam was built allowed for the blasting and excavation of rock. The water from the channel was pumped through a dewatering bag to a vegetated area and not directly to the river. This is because the slow release of water from the dewatering bag over vegetation gives it time to trickle into the soil and through the vegetation which filters out the dirt before the water enters the Nelson River. Water from construction cannot be released into the river if it has more than 25 mg/L total suspended solids (dirt) in it. This target was met by using the dewatering bag.

Water levels were very high in the fall of 2014 and winter of 2015. Water from the Nelson River outside the Powerhouse cofferdam, which was built to allow excavation and construction of the powerhouse and tailrace, seeped into the dewatered area behind the cofferdam. This seepage water within the dewatered area could be pumped directly back to the Nelson River if it had less than 25 mg/L of total suspended solids in it. Water with a concentration higher than 25 mg/L was released to the river between December 31, 2014 and January 17, 2015. This was reported to Manitoba Conservation and Water Stewardship and DFO. Modifications were made to the cofferdam to reduce future seepage.

De-watered area behind cofferdam

Using a dip net for fish salvage

Catfish caught and released during the fish salvage of the North Channel

Fish Salvage

Before areas can be completely dewatered, the fish that remain in the pools of water need to be captured and released to the Nelson River. Three areas were fished, the area downstream of the Quarry cofferdam, the North Channel cofferdam (the north and central channels of Gull Rapids), and the area behind the Powerhouse cofferdam.

Fish salvage took place between July 20 and October 26, 2014. It was conducted using a variety of techniques. Fish were released to the river downstream and observed to see if they survived. The total catch during the fish salvage was 57,432 fish. Survival observed following release was greater than 99%.

There were a variety of species caught but the majority were small bodied Longnose Sucker, Emerald Shiner, White Sucker, Longnose Dace, sculpin, Troutperch and Rainbow Smelt. No Lake Sturgeon were caught during the salvage. In addition to the species expected to be found in this area of the Nelson River, five adult Channel Catfish were caught in the Quarry cofferdam area.

Fish Salvage Activities in the Dewatered Area

Legend

Approximate location of fish salvage activities in the dewatered area

0 0.15 0.3 Kilometers

0 0.15 0.3 Miles

Ice Cutting and Blasting

As Nelson River flows and winter water levels were very high last year, open water was still present upstream of the construction site in January 2015. Managing water levels around the construction site was necessary to allow for construction to continue through the winter. A plan was developed to create stable ice cover by cutting and blasting a large chunk of ice upstream of the site and having it float across the open water to close the gap and promote ice formation in the remaining open water area.

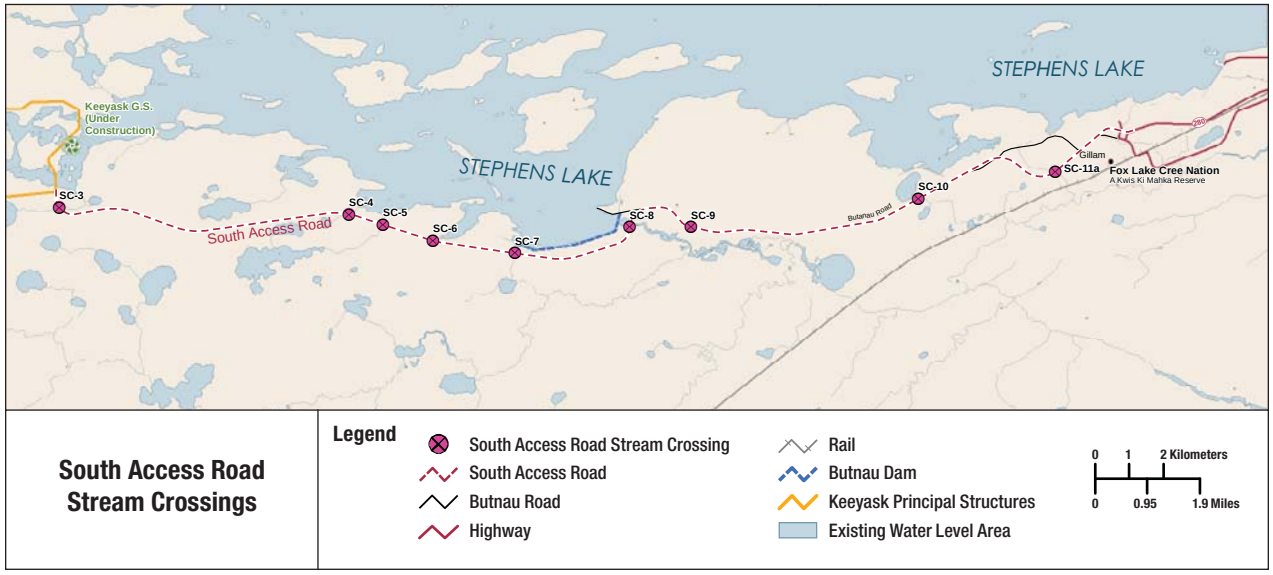
Lake Sturgeon are known to spend the winter in the area where the cutting and blasting was planned. Monitoring prior to blasting confirmed that the Lake Sturgeon were situated far enough away and in much deeper water such that they would not be affected by the blasting. After the blast, Lake Sturgeon monitoring was repeated and the results showed it was unlikely any were harmed by the blast.

The blast successfully cut through the large piece of ice, but it did not move into the channel as planned. Eventually the open water upstream froze over naturally.

South Access Road Culvert Installation

Construction of the South Access Road (SAR) started in January 2015. Nine stream crossings are located along the alignment of the SAR. During January, snow/ice bridges were constructed at the stream crossings to allow access for tree clearing activities.

Design and biological assessments for six crossings on the west portion of the SAR (stream crossings 3 – 8) were provided to DFO for review. DFO responded on March 3, 2015, after which the culverts could be installed.



Erosion and Sediment Control

Various types of erosion control measures installed onsite helped reduce erosion and protect surrounding water quality, such as silt-fence, straw bales, rip-rap and wood mulch. Manitoba Hydro site environmental personnel regularly monitored the erosion and sediment control measures installed to ensure they were functioning correctly and were being maintained.

Silt fence erosion control measure

Spills and Spill Response

A Hazardous Materials Spill Response Plan was developed, which sets the standard for spill prevention planning, responding to hazardous materials spills, reporting requirements and clean-up of spills. All spills, regardless of the amount, were cleaned up immediately.

Between July 2014 and March 2015, there were eight hazardous material spills that had reportable quantities according to legislation. Manitoba Hydro notified Environment Canada and Manitoba Conservation and Water Stewardship about all eight releases.

Of the eight releases, two were releases to water. The first consisted of 2 L of biodegradable vegetable oil being released from an ice cutting machine to the Nelson River, upstream of Gull Rapids. The second release to water consisted of drops of diesel entering an unnamed tributary along the South Access Road.

Of the remaining six spills, five were antifreeze released in volumes ranging from 7 L to 50 L. These spills were caused by equipment failure. The remaining release was caused by a refueling error, where 105 L of diesel fuel was spilled on the ground.

To clean-up these spills contaminated soil was dug up and removed from the area. To confirm the spill locations were cleaned-up properly, soil and water samples were collected from around each spill site. All incident reports, including the results of samples analysed at an independent laboratory, were submitted to regulators.

Clearing and Sensitive Sites

Environmentally sensitive sites, which include the locations of rare plants, priority habitat types, heritage resources and areas close to surface water, are shown on maps in the Environmental Protection Plans. To make sure these sites were not disturbed during clearing activities, a walk-through with the contractor occurred prior to any construction. Purple flagging tape was put up to clearly mark the areas that were not to be disturbed.

Breeding Bird Surveys

Clearing activities were required to access work locations and create haul roads in July and August 2014, which coincides with the breeding bird nesting season. For this reason, clearing could not be undertaken until it was confirmed that it would not disturb active nests and eggs. Surveys for nests took place in 20 different generating station construction areas prior to clearing them. Six nests were found and of those, some were inactive. One nest found had a young bird in it, so a buffer was put around it to prevent disturbance. Where other active nests were found, clearing did not take place until chicks had left the nests. All clearing along the route of the South Access Road occurred during winter, outside of the nesting period, and therefore did not need to be surveyed for nests.

White-throated sparrow nest discovered during breeding bird survey

Bald eaglet in nest on William Smith Island

Eagle Nests

Two bald eagles nests were observed within the construction area in 2014. The first nest was located within the proposed Powerhouse Intake area and was inactive when construction started. A second bald eagle nest was observed on William Smith Island (west) and contained one visible eaglet. A 200 metre buffer was established around each of the nest locations to confirm no construction activities took place in the areas. During a follow-up survey in August, the nest containing the eaglet was no longer in the tree, but the 200-metre buffer remained in case the eaglet was still within the vicinity. Manitoba Conservation and Water Stewardship approved the removal of the inactive nest and tree, which was carried out in October 2014.

Gull and tern islands

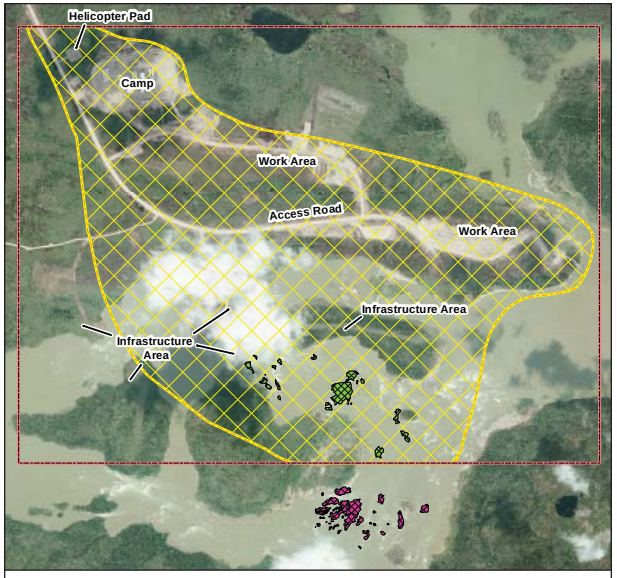
Gulls and Terns

Thousands of gulls and hundreds of terns nest on the rock islands in Gull Rapids each year. In-stream construction, blasting and rock stockpiling in Quarry 7 (the former North Channel) was scheduled to begin in mid-July 2014, which coincided with the nesting period for gulls and terns.

Both the safety of workers, who could be mobbed or distracted by large numbers of gulls/terns, and the protection of the gull and tern colonies were of concern during this time. To address these concerns, a gull and tern control program with a focus on falconry (using predatory birds also known as raptors) was put in place under an Environment Canada permit. The goal of the program was to discourage the use of the construction area by gulls and terns. Nearby habitat was available as an alternate, suitable area for nesting.

When the raptors' handlers arrived at Keeyask in late May 2014, it was estimated there were already around 1300 ring-billed gulls trying to nest in the area that would soon become a construction zone (and also within 1 kilometre of planned blasting). Approximately 1000 additional gulls were settling in on southern islands that were outside of the 1 kilometre blasting zone. Nesting activity was in the early stages and in many cases nesting was occurring on ice as the Nelson River at Gull Rapids still had ice cover. To encourage the gulls to nest away from the construction area, nests and eggs were cleared by the handlers.

In total, 3686 nests and 6446 eggs were cleared from the ice and islands within the 1 kilometre zone to prevent adults and young from being in the dangerous construction area. Many of these nests and eggs would have naturally been destroyed when the ice around the islands melted.



Falconry Flying Area

Legend

- Nesting Islands Outside the Bird Deterrent Area
- Nesting Islands Inside the Bird Deterrent Area
- Permitted Bird Deterrent Area
- Falconry Flying Area

0 0.2 0.4 Kilometers

0 0.15 0.3 Miles

Dash, the peregrine falcon; Duck, the Harris's hawk; Fraction, the gyrfalcon; and Kyd the red-tailed hawk arrived in early June to be the primary force to keep the construction area clear of further nesting activity and to prevent harm to the gulls and terns. The raptors were raised in captivity and each had received training in using their instinctive flying and chasing skills to tackle tasks in areas too dangerous for people, such as the small, slippery rock islands at Gull Rapids. These birds are natural predators of gulls and terns, which instinctively try to avoid them.

Two days before the gull and tern control program ended, one of the raptors with many years of bird control experience was lost to the river. Under some intense mobbing by terns, he appeared to make a momentary misjudgment, and dropped lower rather than climbing above them. He was flying over rushing rapids, and was unable to get himself up in time to clear the turbulent water.

Monitoring indicated the use of falconry was successful in moving the gulls and terns away from the construction area and onto nearby suitable habitat where they were safe and no longer a concern for construction.

Duck (Harris's hawk), 1 of 4 raptors used during the 2014 deterrent program

Wildlife

Wildlife interactions within the Project area were monitored on a daily basis. Wildlife observed included moose, caribou, river otters, martin, Arctic and red fox, lynx, wolves, snow geese and bald eagles. One wolf that was lingering around the construction site had to be destroyed after various trapping efforts failed. Site workers and staff were reminded not to feed or harass wildlife during the camp orientation and at daily morning safety meetings.

Bear Dens

Black bear den surveys were conducted to confirm construction activities did not affect any dens located within the Project area. From late October to early November, any areas scheduled to be cleared in the winter were surveyed. During the surveys, two black bear dens were located. The first was an active den located within the G-3 Borrow Pit and the second was an inactive den located within the N-5 Borrow Pit. A 100 m buffer was installed around each den to ensure no construction activities took place within the area that could disturb the den inhabitants.

Bear den located just outside the Project area at N-5 Borrow Pit

Aboriginal Traditional Knowledge

Each of the partner First Nations is working with Manitoba Hydro (on behalf of the KHLP) to develop community- specific Aboriginal Traditional Knowledge (ATK) monitoring programs for the Project. These monitoring programs will be based on Cree perspectives and understandings about the potential effects of the Project. The following summarizes the work being undertaken by each community with respect to the monitoring programs.

Cree Nation Partners – An Overview of the ATK Monitoring Program

Tataskweyak Cree Nation (TCN) and War Lake First Nation (WLFN), operating together as the Cree Nation Partners (CNP), have occupied the lands and waters of northern Manitoba since time immemorial. Over the centuries, CNP Members have accumulated (and continue to accumulate) invaluable traditional knowledge about their homeland ecosystem, including its many components and their relationships to each other and to themselves. CNP Members have also accumulated unique knowledge related to the effects of hydroelectric development, having lived in the midst of major developments for over five decades.

A morel growing in a newly burnt area around Keeyask

As expressed in the Cree Nation Partners' Environmental Evaluation Report for the Keeyask Generation Project, ATK is "knowledge that reflects our experience, understanding, wisdom, values, beliefs, norms and priorities governing our relationships with Mother Earth and all her beings, derived and developed through living in our homeland ecosystem since time immemorial. ATK is inextricably linked to our culture and our worldview."

CNP are in the process of developing a Keeyask ATK Monitoring Program. This program is intended to contribute to an ongoing assessment of the monitoring and mitigation measures for Keeyask.

CNP intend to engage their Members in a variety of activities to elicit meaningful discussion and action regarding the effects of Keeyask. These include:

- "On the land" monitoring activities, including the development of extensive photographic records of important cultural and spiritual locations;
- Including Elders and youth in on-site monitoring to facilitate the transmittal of ATK to young people;
- Key Person Interviews to determine the direct and indirect effects of Keeyask on all Members;
- Open Houses/Information Sessions for Members to ask questions and provide information;
- Identifying unanticipated effects;
- Monitoring the Adverse Effects Agreements programs to ensure they are working as intended;
- Contributing to the development of mitigation measures for unanticipated effects; and
- Documenting the effects of Keeyask on resource users (hunting, fishing, and trapping).

CNP's participation in the monitoring programs will be essential to recording and interpreting ATK required for the KHLP's monitoring reports and will be an invaluable asset for identifying long-term environmental changes or unique environmental events that may otherwise be overlooked. CNP continue to consult their Members to develop an ATK Monitoring Program which will meaningfully contribute to the mitigation of Keeyask adverse effects on the environment and on their Members.

York Factory First Nation - *Askiy Nanakacihtakewin* Stewardship Program

"We must somehow continuously reconcile our participation in this partnership with our relationships and obligations to the natural and spiritual world – and to our future generations. If we do not, our Elders and their teachings tell us we will not survive as a people." (YFFN in Kipekiskwaywinan: Our Voices, p.27)

York Factory First Nation's (YFFN) community monitoring program will be called the Askiy Nanakacihtakewin Stewardship Program.

Askiy Nanakacihtakewin means, "to watch out for and take care of the lands, waters, wildlife, plants and people of the land". YFFN has chosen the term "stewardship" for its' "monitoring" program, as this word is better aligned with Cree teachings about caring for Askiy as part of the Ininiwak way of life.

For YFFN, stewardship (or caring for Askiy) goes beyond a technical monitoring exercise. The Askiy Nankacihtakewin program will incorporate traditional science and Ininiw kiskenihtamowin (Cree traditional knowledge), with cultural, educational, and traditional elements. Program staff will lead inspections of the Keeyask project site, trips on the land, interviews, workshops, ceremonies, and discussions with local knowledge holders, elders, and youth.

YFFN plan to launch the Askiy Nanakacihtakewin Stewardship Program in the summer or fall of 2015.

Wisakimina, dry ground cranberry

Elder reflecting during Keeyask Aboriginal Traditional Knowledge study

Fox Lake Cree Nation – *Aski Keskentamowin* Monitoring

Fox Lake Cree Nation (FLCN) worked with Manitoba Hydro to collect information that contributed to the Keeyask Generation Project's Environmental Impact Assessment. Studies of the existing environment were considered, such as: the physical environment, terrestrial and aquatic environments, heritage resources, resource use and socio-economic impacts.

An Aboriginal Traditional Knowledge Study was also conducted for the Project. The study helped FLCN gather and share their elders', resource users' and youth experiences and knowledge of the land within the Project area.

This new relationship promises hope and mutual benefit for FLCN to recover, prosper and rebuild from the social, cultural, economic and human impacts of this hydro-electric development project. FLCN is currently in the process of developing a comprehensive Aski Keskentamowin Monitoring Plan from the information previously collected. FLCN will begin conducting local workshops, fieldwork, and continue meeting with other partner First Nations to ensure the Project impacts are monitored, and a healthy working relationship is maintained between our partners and communities.

Elders sharing Aboriginal Traditional Knowledge

Physical Environment Monitoring

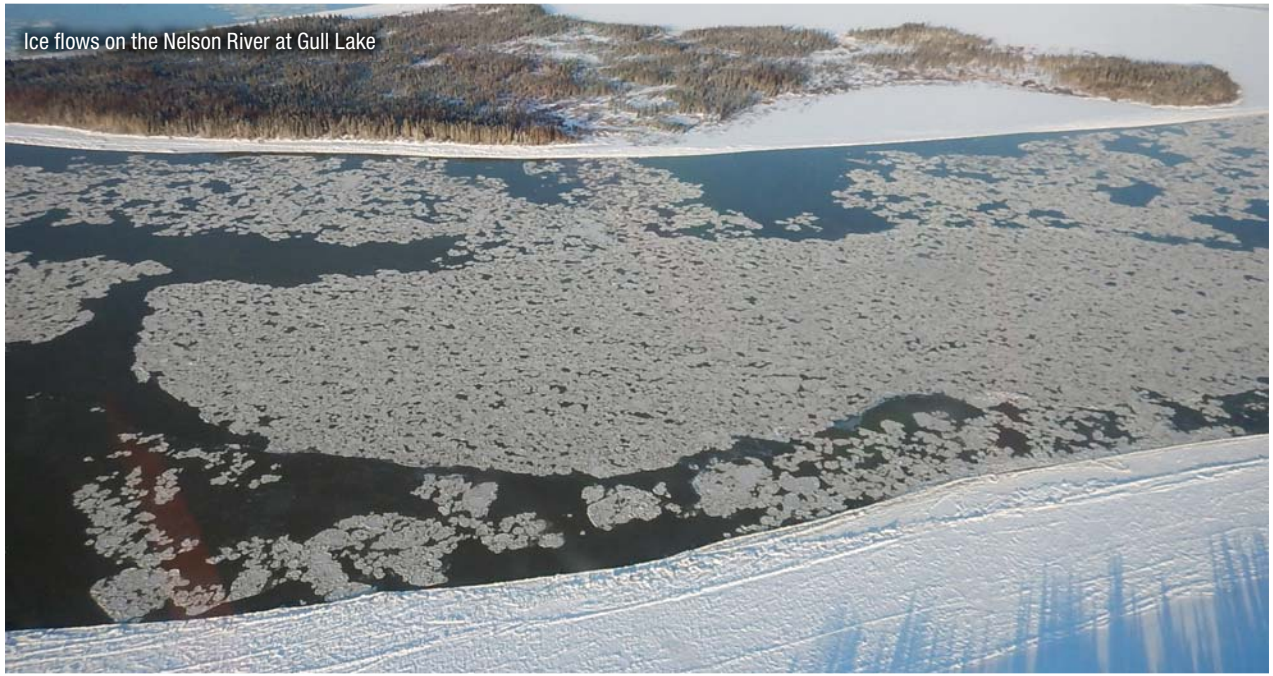
The physical environment includes the physical and chemical components that make up an area including the air, water and land. Construction of Keeyask will change the physical environment by replacing Gull Rapids and Gull Lake with a dam and a reservoir. Monitoring of the physical environment is being undertaken to provide information which may help provide a greater understanding of the cause of a change to a biological and/or socio-economic effect of the Project.

Water and Ice Regime

In the summer of 2014, six water level gauges were installed on the Nelson River between Clark Lake and Gull Rapids to monitor water levels during construction of Keeyask.

Water levels in Gull Lake increased in August by approximately 1.5 metres, due to the construction of the North Channel rock groin, which diverted the river's flow to the channel south of Gull Rapids. In winter, water levels rose by approximately 3 to 4 metres at the upstream end of Gull Lake and at Birthday Rapids and approximately 1 metre downstream of Clark Lake because of an ice dam (chunks of loose ice that get caught and pile up) that formed in late January near the entrance to Gull Lake. Ice dams form most years in this area and the water level increase was similar to what would have happened without the Project. Satellite photos taken throughout the winter were used to monitor how much ice cover there was in the area.

As part of the Keeyask Waterways Management Program, approximately 88 kilometres of new safe ice trails were implemented between February and April 2015; consisting of 51 kilometres on Stephens Lake (downstream side of Keeyask) and 37 kilometres on Gull Lake (forebay side of Keeyask).



Ice flows on the Nelson River at Gull Lake

Preparing to install equipment on Gull Lake

Water flowing past the cofferdam in the South Channel of Gull Rapids

Greenhouse Gas

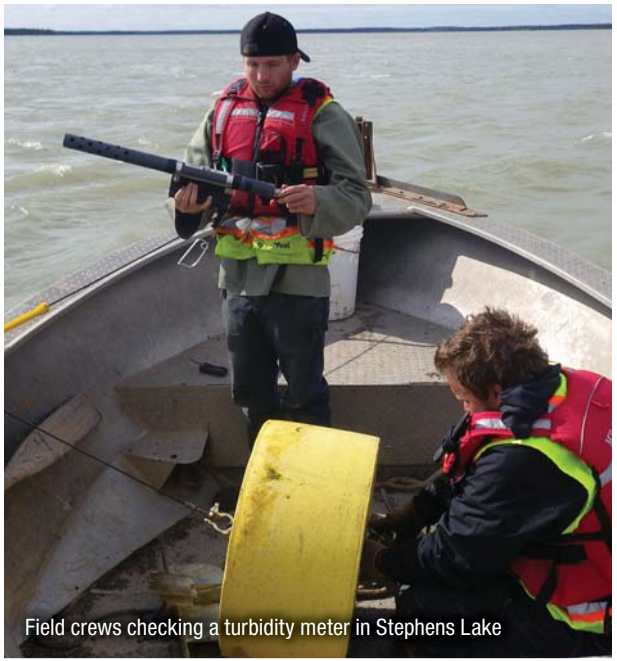
Northern Manitoba reservoirs are not believed to be major contributors of greenhouse gas emissions as compared with electrical generating stations operating on fossil fuels. Greenhouse gas, primarily carbon dioxide and methane, monitoring in the waterway was done to determine the amount of greenhouse gas emissions from the water before reservoir flooding occurs. Monitoring showed that greenhouse gas emissions in 2014-15 were similar to the emissions in previous years when monitoring took place. The monitoring information will be used to determine the change in greenhouse gas emissions once the reservoir is filled.

Debris

Debris, such as floating logs and branches, was monitored and removed where it posed a safety hazard for boats. This activity is being carried out as a part of Manitoba Hydro's broader Waterways Management Program in northern Manitoba. With the start of the Project, there is an increased focus on managing debris in the Project area between Clark Lake and Stephens Lake. Project related debris effects are not expected until the reservoir is filled in 2018/2019.

Shoreline Erosion and Reservoir Expansion

Satellite photos were collected to determine the current state of the shoreline The same type of photos will be collected before and after the reservoir is filled with water to monitor shoreline erosion and reservoir expansion.



Field crews checking a turbidity meter in Stephens Lake

Maintenance check at a turbidity monitoring station

Sedimentation

Monitoring sediment (materials such as clay and sand) in the Nelson River is being undertaken for the Project under two different monitoring programs, for two different purposes.

Sedimentation is being studied as part of the Physical Environment Monitoring Plan to determine the change over time in sediment concentration in the water and to determine where sediment is being carried during construction and particularly during operation of the generating station. Various methods are used for this program to monitor sediment between Clark Lake and the Kettle Generating Station. The majority of the monitoring is upstream of the construction site and the information produced will add to baseline information collected prior to construction. This information will be compared with monitoring information that is produced after impoundment of the reservoir to understand how sediment levels change.

Continuous turbidity meters (measuring the murkiness of water) are automated, electronic devices. They were installed at five locations in the summer and three locations in the winter (see monitoring location map on page 52). Water samples were also collected periodically at the same locations as the meters, as well as another 21 locations, to monitor how much sediment is suspended in the water. Two sediment traps, which are tubes installed on the bottom of the waterway to collect sediment that settles out of the water, were set up. In addition, samples were taken from two locations to measure sediment moving along the bottom of the river.

Collecting turbidity data in winter through the ice on Gull Lake

Automated probe that measures turbidity in real time

Sediment Management

The second monitoring program is described in the Sediment Management Plan for In-stream Construction (SMP). It is being carried out to monitor suspended sediment in the river that originated from constructing structures, such as the cofferdams, which involves putting rock, clay and sand in the river. The SMP requires construction personnel to review suspended sediment data collected every 15 minutes, 24 hours a day, whenever in-stream construction is taking place. Three stations are used to monitor the change in suspended sediment under the SMP. One monitoring site is located upstream of the construction area and measures the background suspended sediment. There is another site just downstream of Gull Rapids, below the in-stream work area, and a third monitoring site is located about 9 km downstream from the rapids. The data from these locations is graphed and measured against a set target level which was acceptable to the regulators. If there is a measured increase in suspended sediment above the target level, the source of the extra sediment must be identified and action must be taken to reduce sediment inputs caused by the construction activity.

SMP monitoring began in July 2014, when in-stream construction started and carried on through the summer and for most of the in-stream work performed during the winter. During this time, various cofferdams and rock groins were built. There has been no observed change to suspended sediment in the Nelson River caused by construction.

Solar-powered turbidity monitoring station downstream of Gull Rapids

Aquatic Effects Monitoring

Aquatic effects monitoring activities will take place during construction and operation to determine the effects the Project is having on the aquatic environment, including water quality, benthic invertebrates, and fish. Monitoring will also determine if fish are using the mitigation measures that will be constructed, such as the constructed rock reefs to promote Lake Whitefish spawning , and to determine if Lake Sturgeon populations are stable as a result of annual stocking.

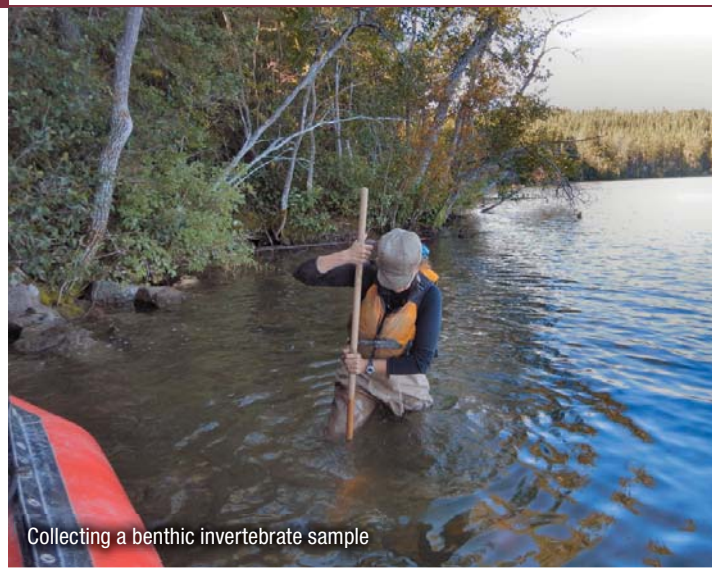

Benthic invertebrate sample collection

Water Quality

Water quality is an important part of the aquatic environment as it affects the health of plants and animals that use it. The greatest effect of construction on water quality relates to increasing the amount of sediment in the Nelson River. This can be caused by building structures such as cofferdams in the river, changes to water levels or flows that increase shoreline erosion, and various on-land activities such as clearing, where a site is stripped of vegetation and the bare soil can wash into the river. A water quality study conducted during the first few months of construction showed no difference between the water quality upstream and downstream of the construction site. This means that so far, construction activities do not appear to be changing water quality in the river.

Benthic Invertebrates

Benthic invertebrates are young insects, clams and worms that live on the bottom of rivers and lakes and are an important source of food for fish. The benthic invertebrate community is monitored because these animals give a good indication of the health of a waterbody and respond quite quickly to changes


Collecting a benthic invertebrate sample

in the environment. When the numbers and kinds of invertebrates change, it may be an early warning signal that something is harming the aquatic environment.

Sampling for benthic invertebrates was done downstream of the construction site at three locations in Stephens Lake, as well as in the Burntwood River just upstream of Split Lake and in Split Lake to indicate "natural" conditions. The samples collected downstream of the construction site did not show the kinds of negative changes that occur when benthic invertebrates are exposed to too much sediment in the water. This means that the sediment inputs from the construction site were likely low enough to not have a negative effect on the aquatic environment.

Lake Sturgeon

Lake Sturgeon (*Namao* in Cree) is a key species for monitoring for several reasons: they are important to the partner First Nations; the population is already not doing well; and the generating station will change or destroy important habitat including the loss of Gull Rapids and creation of the reservoir, which will change water level upstream to Birthday Rapids.

Lake Sturgeon are being studied to understand how the population is affected by construction, if there are changes after the station is built and operating and how the stocking of Lake Sturgeon is helping the population (see Fisheries Mitigation section on page 29). Both adult and juvenile sturgeon are being studied to see how many adults are spawning and how many young born in the wild are surviving as well as to see how the fish that are stocked are surviving. The goal of the Partnership is to have self-sustaining populations of Lake Sturgeon in this region in the future.

Population monitoring of adult Lake Sturgeon was done in the Nelson River between Clark Lake and the Kettle Generating Station during spring of 2014. This was prior to the start of construction so it is the last year of estimating the population without the effects of the Project. During the study 239 Lake Sturgeon were caught in the Keeyask area, of which 131 were determined to be adults as they were more than 10 years old and 800 mm long. From this study, it is estimated that in 2014 there were 596 adult Lake Sturgeon in the area which is similar to the past four population estimates done since 2006. Very few Lake Sturgeon were caught in Stephens Lake. The population there is, and has been, very low for some time.

Juvenile Lake Sturgeon population monitoring took place in fall of 2014 in three locations: the Burntwood River, Gull Lake, and Stephens Lake. In the Burntwood River, many different sizes of Lake Sturgeon were caught which probably means that Lake Sturgeon have been reproducing every year. With construction now underway, this is the first year where effects on juvenile Lake Sturgeon occur, but because it is so early in the construction phase, no effects could be determined.

Fish collection for population studies

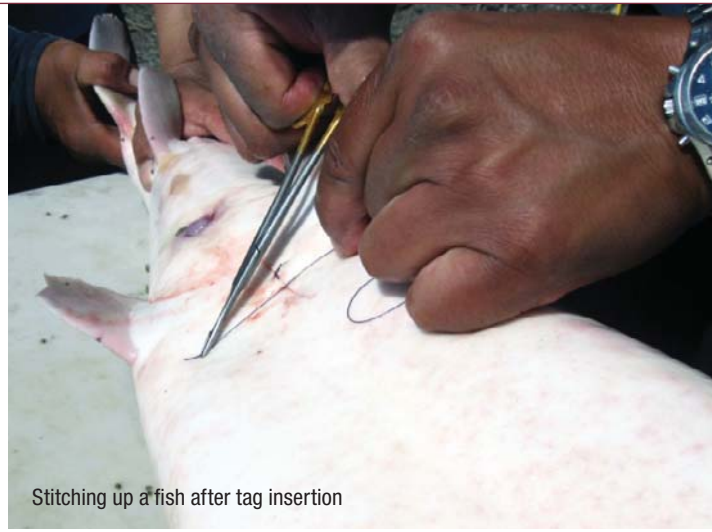
Fish Movement

In-stream construction activities create a disturbance and changes where the water flows in the Nelson River around Gull Rapids. When construction of the generating station is complete it will create a barrier for fish movement. Fish will only be able to move downstream through the generating station or through the spillway when it is operating. There will be no means to move upstream from Stephens Lake into Gull Lake unless a means of fish passage is put into place. For these reasons, the movements of fish are being studied to find out if fish are avoiding the Project construction area and if fish need to move over Gull Rapids to fulfill their life. If studies indicate that movement upstream to Gull Lake is necessary, a means of passage will be created. Adult and juvenile Lake Sturgeon as well as Walleye (commonly known as pickerel) and Lake Whitefish are included in the movement studies.

Fish have tags implanted inside them that send out a unique sound called a ping. Devices, called acoustic receivers, are placed in the Nelson River between Clark Lake and Gull Rapids, and in Stephens Lake. These receivers can detect and record the "pings" up to 1 km away. By looking at the pings that were recorded by receivers in different places, the movement of each fish can be followed.

Adult Lake Sturgeon

Fifty-nine adult Lake Sturgeon, about half in Gull Lake and half in Stephens Lake, were tagged in 2011. The tags are expected to continue to function for about 10 years. Monitoring in 2014 builds on the previous three years of learning about these fish. The majority of the adult Lake Sturgeon tagged in Gull Lake remained in the same general area most of the time except in the spring when some of the Lake Sturgeon from Gull Lake moved to Birthday Rapids, probably to spawn. The Lake Sturgeon tagged in Stephens Lake mostly stayed in the former river channel in Stephens Lake. Since 2011, six adult Lake Sturgeon moved upstream through Gull Rapids and in 2014 two fish moved downstream. These movements all happened in the fall.



Stitching up a fish after tag insertion

For each year of the study, from May to September, one group of Lake Sturgeon spent most of their time along the north shore of the Nelson River, just downstream of the north channel of Gull Rapids. In 2014, however, the quarry cofferdam cut off flow to the north channel and the Powerhouse cofferdam was built in the fall. This group remained near the construction area before moving further downstream, like they had in previous years.

Juvenile Lake Sturgeon

Forty juvenile Lake Sturgeon were tagged in the fall of 2013, 20 in Stephens Lake and 20 in Gull Lake. These tags are expected to continue to work until 2017. Juvenile Lake Sturgeon in Stephens Lake moved around more during the year than those in Gull Lake. This may be because there is more deep water there for them to live in. Unlike in the summer, in the winter these fish appear to move very little and stay in deeper areas with little current. A few juvenile Lake Sturgeon were detected near Gull Rapids on the downstream side but none spent very much time there.

This study showed that juvenile Lake Sturgeon were not using the area around the construction site very much. Monitoring juvenile Lake Sturgeon movement showed that juveniles tagged in Gull Lake stayed in Gull Lake and juveniles tagged in Stephens Lake mostly stayed in Stephens Lake, except for one tagged fish that moved through the Kettle Generating Station and into the Long Spruce Reservoir. This fish was later detected which indicates it survived passing through the generating station. It is not known if it went through the powerhouse or the spillway.

Walleye

The Walleye movement study involved tagging 80 walleye in fall 2013. Of the 80 tagged, 40 were upstream and 40 were downstream of Gull Rapids. The Walleye tagged upstream of Gull Rapids usually stayed in wider lake areas with low flow. Most of the Walleye stayed close to the area where they were tagged and a small number moved upstream through Birthday Rapids into Clark Lake. One of these fish was recaptured as far upstream as the Odei River, 100 km from where it was tagged. Two of the fish moved downstream through Gull Rapids.

Most of the Walleye tagged downstream of Gull Rapids stayed in Stephens Lake. One fish moved upstream over Gull Rapids in late August/early September and continued upstream through Gull Lake into Clark Lake. Another fish moved downstream through the Kettle Generating Station and is known to have survived passing through it. Walleye were often detected immediately downstream of Gull Rapids and in the upper 6 km of Stephens Lake.

Lake Whitefish

Lake Whitefish movement was monitored only in the fall of 2014. Sixty Lake Whitefish were tagged in late September/early October 2014. Twenty were tagged upstream and 40 were tagged downstream of Gull Rapids. Of the 60 fish tagged, 50 of them were detected after tagging; 15 of those tagged upstream and 35 of those tagged downstream. The upstream fish travelled further upstream to near Birthday Rapids and the downstream fish remained within the upper area of Stephens Lake.

Whitefish monitoring

Fisheries Mitigation

The Fisheries Offsetting and Mitigation Plan provides descriptions of the mitigation and offsetting measures developed to ensure that habitat to support all life stages of local fish species continues to be available upstream and downstream of the generating station after it is constructed and operating. Measures will be implemented to reduce the impacts of the Project on the aquatic environment and offset the loss of fish habitat. Habitat, such as spawning shoals, will be constructed over the next few years. In addition to habitat creation, stocking will be used as an additional offsetting measure for Lake Sturgeon to address the current low population numbers and loss of spawning habitat during construction prior to constructed habitat being available.

Sturgeon Stocking

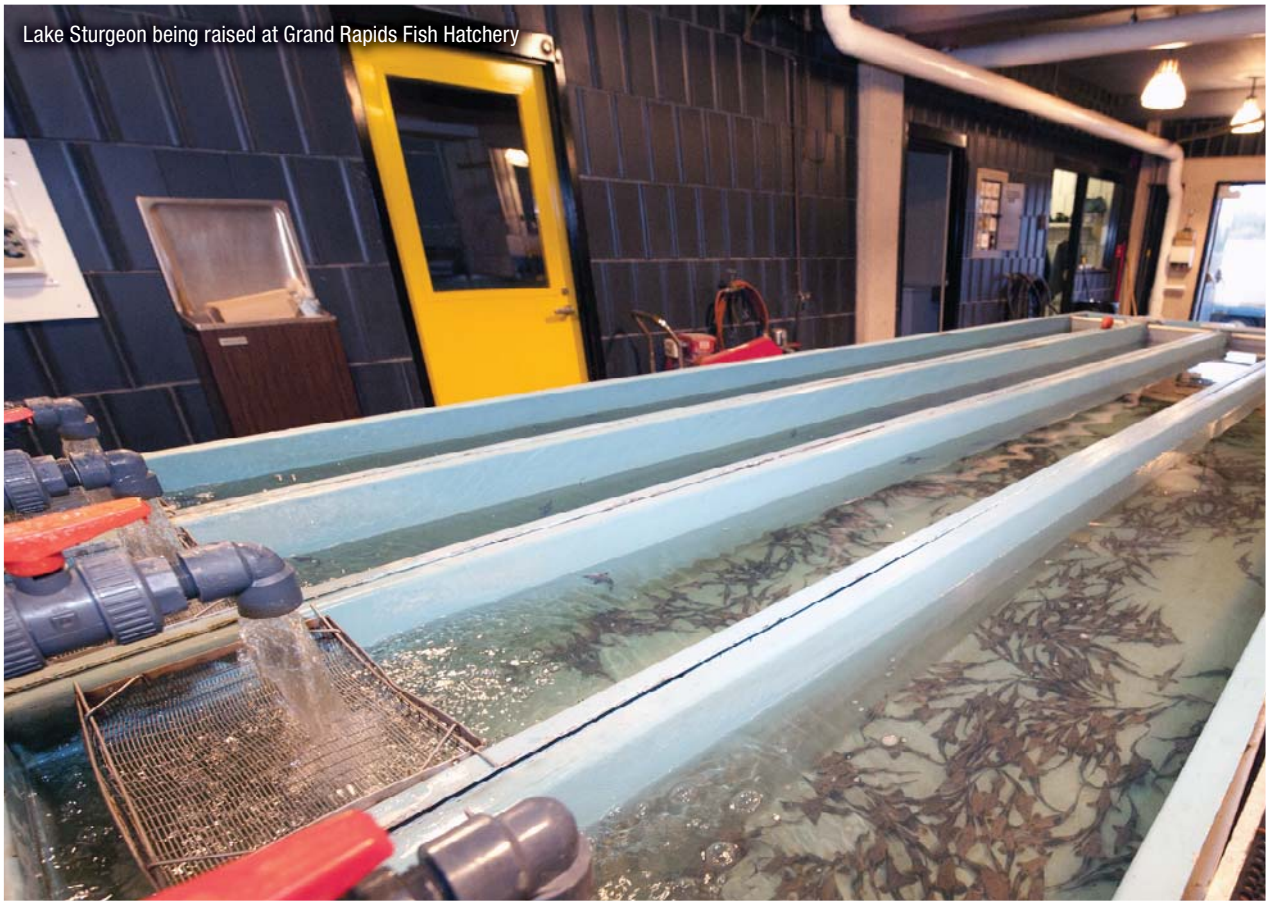
Stocking has been identified as being critically important to the overall offsetting plan due to concerns that the current Lake Sturgeon populations may be too low to recover unaided, even if the generating station was not being constructed. To increase Lake Sturgeon populations, the KHLP committed to produce and release hatchery reared Lake Sturgeon into the Burntwood River, the future Keeyask reservoir and downstream in Stephens Lake until a self-sustaining population was achieved. The stocking activities will alternate between the Burntwood River and the lower Nelson River annually.

Grand Rapids Fish Hatchery staff releasing Lake Sturgeon into Gull Lake, September 2014

Monitoring a wild adult Lake Sturgeon at the Burntwood River spawn camp, June 2013

A total of 295, one-year-old Lake Sturgeon (28 cm), raised at the Grand Rapids Fish Hatchery since they hatched, were stocked (released) into the Burntwood River on October 2, 2014. These stocked fish were the offspring of wild Lake Sturgeon (1 female and 3 males) captured from the Burntwood River in June 2013. Students and community members from York Factory First Nation assisted hatchery staff during the fall stocking event.

In the spring of 2014, wild Lake Sturgeon were captured below Birthday Rapids and the milt (sperm) of two males was mixed with the eggs of one female providing an estimated 250,450 eggs. Fertilized eggs were flown from the spawn camp (collection location) to the hatchery. Approximately 184,500 Lake Sturgeon hatched from these eggs between June 21 to 24, which meant that 74% of the eggs collected, hatched. In July 2014, over 153,000 one-month old Lake Sturgeon (3 cm) were flown to a location just downstream of Birthday Rapids, where they were released into the wild. Roughly, 8,300 Lake Sturgeon were kept at the hatchery to continue growing for future stocking. At the end of September, 4,656 three-month old (10 cm) Lake Sturgeon were released into Gull Lake. Another 896 Lake Sturgeon were held at the hatchery over the winter for future stocking. On March 31, 2015, over winter survival of these Lake Sturgeon at the hatchery was 97% and the average fish length was greater than 23 cm.



Lake Sturgeon being raised at Grand Rapids Fish Hatchery

Zebra Mussel Monitoring

The Zebra Mussel is a small, clam-like aquatic animal. They are considered an aquatic invasive species in North America due to their ability to aggressively invade new areas and reproduce quickly. They also lack natural predators. Zebra Mussels are known to negatively affect native fish and wildlife and obstruct water-based infrastructure, including hydroelectric generating stations, such as the Keeyask Generating Station.

Introduction of Zebra Mussels into non-infested waterbodies may result from transportation of Zebra Mussels by overland movement of boats and other water-based equipment. Zebra Mussels have been found in Lake Winnipeg, but are not present in the Nelson River at this time. The intent of the Zebra Mussel Monitoring Plan is to monitor to see if they appear and to mitigate and adaptively manage Zebra Mussel impacts if they occur.

Zebra mussels can clog pipes


Zebra mussels are tiny - less than half an inch long

Terrestrial Effects Monitoring

Terrestrial effects monitoring activities will take place during construction and operation to determine effects of the Project on key components of the terrestrial environment, including ecosystems, habitat, plants, amphibians, birds, and mammals. The terrestrial monitoring will also determine the effectiveness of terrestrial mitigation measures. The following terrestrial studies were conducted from July 2014 to March 2015.

Rare Plants

Rare plants are plants that are not commonly found in the Keeyask area. Some rare plants are also protected by federal or provincial regulations. Surveys for rare plants and plants of particular importance to the partner First Nations are conducted before clearing Project areas to prevent disturbing them. If rare plants are found during the pre-clearing surveys, possible mitigation includes avoiding these plants or transplanting into other areas not being affected by the Project. In the summer and early fall of 2014, a pre-clearing search for rare plants took place in the Project area. One species of a provincially-listed rare plant (muskeg lousewort) was found at multiple locations during the survey. Additional rare plant surveys will be conducted in the summer of 2015, to look for more rare plants and to see if potential suitable locations to transplant muskeg lousewort can be found.

Muskeg lousewort, a rare plant found during surveys

Moose Survey

Moose are important to resource users, as they are harvested by residents and non-residents of the Keeyask area. During construction, it is predicted there will be small changes to where moose are found around Keeyask due to noise and changes to the land. The partner First Nations expressed concern about effects of the Project on moose habitat and populations. Monitoring is being undertaken to confirm predictions and address these concerns.

In January 2015, an aerial survey covering 1700 km^2 was flown to determine the distribution and number of moose in the Keeyask area. Moose aerial surveys are conducted in winter when moose are easiest to spot. The number of moose observed in the study area during the aerial survey shows that the population is stable. A slightly higher number of moose were observed than were observed in the survey conducted in 2010. It was also observed that one of every two cows had a calf in the 2015 survey.

Moose observed during aerial survey

Terrestrial Mitigation

The Terrestrial Mitigation Implementation Plan outlines a number of planned terrestrial mitigation measures that will take place during the construction of the Project. The measures include the development of a wetland, retaining woody debris for amphibians, replacement of habitat for gulls and terns, and habitat replacement for other birds.

Project construction has resulted in the removal and/or change in quality of some gull and tern breeding habitat. In early 2015, an area on the south side of William Smith Island (west) was cleared to create a new gull nesting habitat area. In early 2015, two floating nesting platforms were constructed for terns, to be installed in the spring, to offset the loss tern nesting habitat.

Tern nesting platforms being constructed

Gull and Tern Habitat Replacement

Three species of colonial waterbirds nest near the Project site on rocky islands and reefs in Gull Rapids: ring-billed gull, herring gull and common tern. Their breeding habitat is considered rare as only a small number of the reefs and islands that occur near the Project site are considered ideal for nesting. Nesting islands used by these birds are typically rocky, support little to no vegetation, have stable banks and have limited access by land predators.


Preparation of gull nesting habitat area on William Smith Island (west)

Caribou

Although not included in the Terrestrial Mitigation Implementation Plan, a number of mitigation measures were developed to address potential Project effects to caribou, including loss of caribou habitat and sensory disturbance due to Project development. Mitigation measures included changes to the placement of Project features (adjusting access roads, borrow areas, and excavated material placement areas to avoid known caribou calving habitat), minimizing blasting during the caribou calving period, and the creation of a Keeyask Caribou Coordination Committee (KCCC). The KCCC includes members from TCN, WLFN, FLCN, YFFN, and Manitoba Hydro and is a sub-committee of the Monitoring Advisory Committee. The KCCC met in January and March of 2015 to discuss past and future planned monitoring of caribou for the Project.

Moose

The Cree Nation Partners developed the Moose Harvest Sustainability Plan to ensure that their Access Programs, which provide Tataskweyak and War Lake Members with replacement hunting opportunities for those lost due to the construction and operation of the Project, will enable the communities' traditional relationship with moose to continue forever by ensuring a sustainable harvest. The 2015 population estimate for part of the Split Lake Resource Management Area indicated that the Plan is working as intended.

Vegetation Rehabilitation

The KHLP is committed to rehabilitating areas disturbed by construction and not needed for generating station operation. The Keeyask Vegetation Rehabilitation Plan describes the areas to be rehabilitated, which include roadside ditches, borrow areas, areas where excavated material is placed, and haul roads. The proposed methods for rehabilitation include planting trees, grass and traditional plants, as well as facilitating natural regeneration. All the plant species used during site rehabilitation will be native to the area and seedlings will be grown from seed collected from locations near the Keeyask site. Members of partner First Nations will be involved in rehabilitation planning and planting activities.

In February 2015, a cone harvest program was carried out to gather native black spruce and jack pine cones from northern Manitoba for the purpose of growing tree seedlings. Eight community members worked with Manitoba Hydro personnel for approximately two weeks to collect black spruce and jack pine cones. These cones were processed, which includes extracting the seeds, and tested for viability in preparation for planting.

Bucket of black spruce cones

Picking spruce and pine cones from tree tops and limbs at the Keeyask Start-up Camp

Black spruce cone and seed

Resource Use Monitoring

Resource use is monitored to understand Project effects on traditional harvest by local First Nations' people. If not controlled, increased harvest associated with an increase in people coming to the Keeyask area to work could have detrimental effects on local fish and wildlife. Onsite harvest by the Project workforce is not expected because hunting and fishing are prohibited at the project site. However, if the workforce harvests resources in off-site areas, this may affect the success of local First Nation peoples' resource use. The Project may also draw other resource harvesters, such as licensed hunters and fishers, to the area. Use of the site by local authorized resource users is also important to monitor, in order to understand the levels of harvests occurring on the Project site.

In November 2014, a workforce harvest survey was conducted. One hundred and forty-six, in-person surveys of Keeyask personnel took place. The survey included questions such as whether or not the workforce participated in fishing, hunting and gathering activities. The workforce survey indicated no increase in the amount of resource harvest in the local area.

As of March 31, 2015, there were no requests for gate access by authorized resource harvesters. While access to the site is still possible by using local trails, information on site harvests was not found.

Interviews with Manitoba Conservation staff regarding changes in licensed fish, moose and caribou harvest in Game Hunting Areas 1, 2, 3 and 9 (the majority of northern Manitoba, including the area surrounding Keeyask) occurred in March 2015. As such large areas were being discussed, information gathered from these interviews is very general; however they indicated that in this monitoring year there has been an increase in recreational fishing. This is primarily catch and release and can be linked to the Project workforce. Moose harvest by southern hunters has increased (there is no indication that this is Project workers), and licensed caribou harvest has remained the same.

Assean River at PR 280 looking south

Socio-Economic Monitoring

Socio-economic monitoring for the Keeyask Generation Project allows the examination of the effects the Project has on key components of the socio-economic environment. This includes employment, purchases, business opportunities, population, culture, spirituality, and mercury and human health.

Economic Monitoring

Economic monitoring includes monitoring of employment and training, business, and income outcomes from the Project.

Things that influence economics are categorized as direct, indirect or induced impacts. Direct impacts are due to project expenditures and refer to employment, purchases and income generated by the Project itself. Indirect impacts refer to the employment, purchases and income created in other industries as the effects of project expenditures work their way through the economy. For example, there are indirect impacts on businesses supplying materials and equipment to companies in the direct impact segment. Induced impacts are created by additional income and profits earned by workers and company owners associated with the project directly or indirectly. This additional income leads to more spending on food, housing, entertainment, transportation, and all of the other expenses that make up a typical household budget. Adding up the direct, indirect and induced impacts results in the total economic impact of the Project.

Keeyask will influence the Manitoba economy by providing employment (creating labour income) and through the purchase of goods and services required to build the Project. In turn, these expenditures will result in incremental provincial tax revenues and contributions to the provincial gross domestic product. The following sections discuss the major direct economic impacts of the Project from the beginning of construction in July 2014 to March 31, 2015.


Monitoring jobs providing employment


Rock truck hauling material

Major Direct Economic Impacts

Major Economic Components	Total
Person-years of direct employment	632[1] (421[2])
Direct project purchases ($ Millions)	$ 346.3
Direct labour income ($ Millions)	$ 43.2

[1] This number is used for economic comparison purposes and is based on person years in terms of a 2 000 hour per year basis.

[2] This number is used for construction planning purposes and is based on person years in terms of 3 000 hour per year.

Inspection of heavy machinery working in Quarry 7

Employment

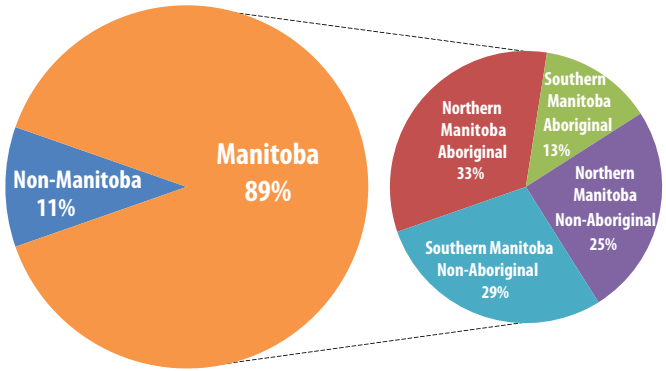
The objective of monitoring employment opportunities is to determine the overall employment outcomes of Project construction, with particular emphasis on Aboriginal and northern resident participation in employment.

Employment can be measured in different ways, including hires, employees and person-years. Hires refer to the number of people hired for any amount of time at the Project site. One individual may be hired more than once (for example, for different contracts) and each hire is recorded separately. However, when part-time and/or seasonal workers are hired, it is useful to standardize the hires in terms of person-years of employment. A person-year of employment means one full-time position for one year. This usually means about 2,000 hours of work per year using a standard 40 hour work week in most industries; whereas for Keeyask construction work, a person-year of employment represents 3,000 hours of work per year. The person-years of employment are shown both at the 2,000 hours of work per year, for economic comparisons to other industries, as well as at the 3,000 hours (identified in parentheses) of work per year.

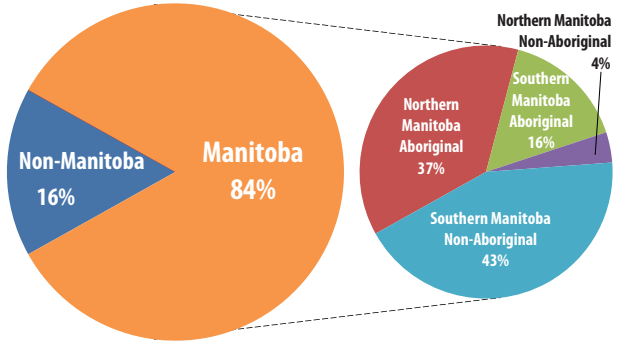
Person-years of Employment

From the start of construction to March 31, 2015, direct employment because of the Project totalled 632(421) person-years. Of this, 89%, or 564 (376) of these person-years, represent people already living in Manitoba. Northern Manitobans represented 58%, 327 (218) person-years, Aboriginal employment represented 46%, 261 (174) person years, and non-Aboriginal employment represented 54%, 303 (202) person-years of the Manitoba employment.

Total Person Years of Employment Breakdown



Breakdown of Hires



Hires

From the start of construction to March 31, 2015, there were 1783 hires on the work site. Of the total hires, 1494 or approximately 84% were Manitobans. Total northern Manitoban, Aboriginal, and non-Aboriginal hires represent approximately 41% (614 hires), 53% (792 hires), and 47% (702 hires), respectively, of Manitoban hires.

Total hires by job classification are provided in the table below. For employee privacy and confidentiality reasons, the numbers of hires by residency cannot be disclosed.

Dining hall jobs providing employment

Total Hires by Job Classification

	Total Hires	Percent of Total Hires	Aboriginal	Non-Aboriginal	Northern MB	Other MB	Non-MB
Labourers	208	12%	131	77	107	61	40
Security Guards	55	3%	23	32	21	34	<5
Crane Operators	9	1%	<5	6	<5	7	<5
Equipment Operators	236	13%	114	122	75	122	39
Teamsters	171	10%	110	61	86	72	13
Carpenters	94	5%	45	49	22	68	<5
Insulator Workers	40	2%	<5	36	<5	34	6
Lathing and Drywall Workers	29	2%	6	23	<5	13	15
Cement Masons	7	<1%	<5	<5	<5	<5	<5
Sheet Metal Workers	5	<1%	<5	<5	<5	<5	<5
Roofers	6	<1%	<5	6	<5	6	<5
Sheeters, Deckers and Cladders	14	1%	5	9	<5	14	<5
Iron Workers	63	4%	15	48	6	56	<5
Rodmen	7	<1%	<5	<5	<5	6	<5
Electrical Workers	71	4%	19	52	15	55	<5
Plumbers and Pipefitters	39	2%	11	28	<5	37	<5
Office and Professional Employees	93	5%	45	48	30	53	10
Caterers	203	11%	198	5	184	18	<5
Trades with less than 5 total hires*	17	1%	<5	17	<5	14	<5
Other**	416	23%	75	341	61	201	154
Total Hires	1783	100%	814	969	614	880	289

For employee privacy and confidentiality reasons, categories with less than five hires are shown as <5

*Includes millwrights, painters, glassworkers, and floor covering installers, boilermakers, sprinkler system installers and elevator constructors.

**The "Other" category refers to hires in job classifications not covered by the Burntwood Nelson Agreement, i.e. "out of scope" positions. This would include managerial and supervisory staff (both Contractor and Manitoba Hydro), other Manitoba Hydro on-site staff and certain technical staff (engineers and technicians).

Workers inspecting rock

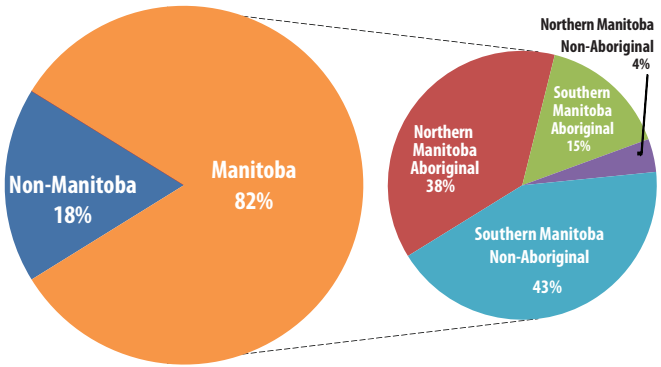
Individual Employees

A total of 1610 individual employees were hired on the Project. Of this, 82% (1326 individual employee hires) were Manitobans.

The breakdown of total Keeyask Generation Project individual employees can be seen in the graph below

The total number of employees is less than the total number of hires (1783) because the same individual may have been hired more than once. The difference of 173 identifies the number of re-hires at the project site.

Breakdown of Employees



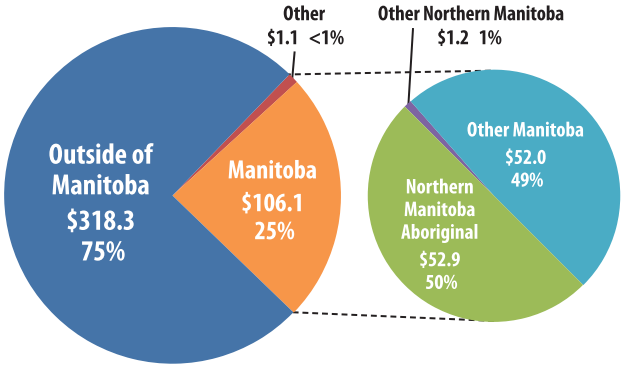
Business Opportunities

Project construction will present direct and indirect business opportunities locally, regionally and across the province as a whole. Business outcomes of Project construction are being tracked, with a particular focus on Aboriginal and northern Manitoba business participation, to understand indirect business opportunities generated from Project-related expenditures in Gillam, Thompson and the partner First Nation communities.

Purchases

There was $425.5 million spent on goods and services for the Project. Of this, $106.1 million were Manitoba purchases. Total northern Manitoba (Aboriginal and non-Aboriginal) purchases represent $52.9 million or 50% of the total Manitoba purchases. Another $1.1 million was spent on other purchases using credit cards and cheques where there is no definitive way to confirm whether the vendor is a northern, Aboriginal, Manitoba or non-Manitoba business. The graph

Direct Purchases



summarizes the breakdown of total purchases to March 31, 2015. This information reflects direct purchases of the Project for contractors and services. Indirect purchases made by contractors, in turn, would include purchases of goods and services from Manitoba based businesses.

At the peak of Keeyask's General Civil Contract, Key Person Interviews will take place to determine any indirect business opportunities that may be generated as a result of the Project.

Keeyask Main Camp aerial photo November 2014

Income

Project construction will generate income from a number of sources including employment, business opportunities and payment of taxes. Partner First Nations' construction income will originate mainly from employment and to a lesser extent from business opportunities, while employment will be the main source of income for Aboriginal residents in the Regional Study Area.[1] During the operation phase, the partner First Nations will receive additional equity income as a result of being partners in the Project.

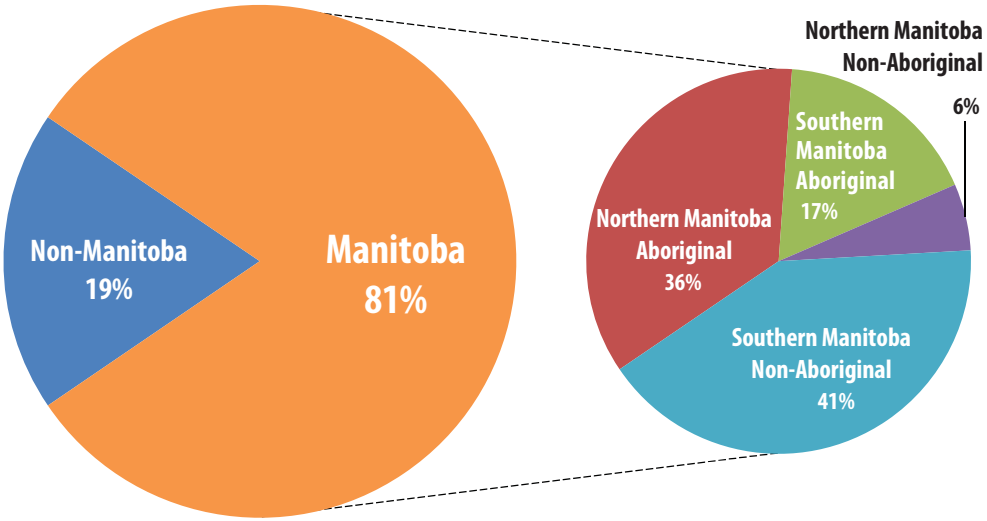
Labour income is an important indicator of the direct economic impact of a project. The estimate of labour income reflects the direct income earned by workers from employment on the Project. It is the sum of wages and salaries associated with direct person-years of employment. Monitoring will determine the levels of employment income generated by construction of the Project.

The Project generated $43.2 million in total labour income.[2] Of this, Manitoba labour income represented $35 million or approximately 81% of total labour income. Of total Manitoba labour income, Aboriginal labour income represented approximately $18.5 million (53%), northern Manitoba Aboriginal labour incomes represented approximately $12.5 million (36%), northern Manitoba non-Aboriginal represented approximately $2.0 million (6%), and non-Aboriginal represented $16.5 million (47%).

[1] The Regional Study Area includes the Churchill-Burntwood-Nelson communities identified in the 2009 BNA (Burntwood-Nelson Agreement) under the employment hiring preference Zone 2.

[2] Labour income is calculated based on information provided by contractors and Manitoba Hydro.

Total Project Labour Income Breakdown



Social Monitoring

Population

The Project's Environmental Impact Statement (EIS) predicted that the Project would not result in notable changes to the number of people in the partner First Nation communities, and that there will not be many people moving into the communities because of the Project construction. Similarly, Gillam was not predicted to see any substantial population growth as a result of Project-related construction and Thompson was also not expected to see any major construction-related population change.

However, accurately identifying the precise levels of in- and out-migration is difficult, and the partner First Nations have noted that any in-migration to their communities could stress services already at capacity. Monitoring populations is being done to confirm the extent of Project-induced migration in the partner First Nations' communities and Gillam. If population change monitoring suggests project-induced in-migration or out-migration is greater than predicted, Key Person Interviews will be undertaken to further understand the influence of the Project on population.

While it is too early to measure the impact of Project construction on community populations, the following information is intended to serve as a baseline for future reports.

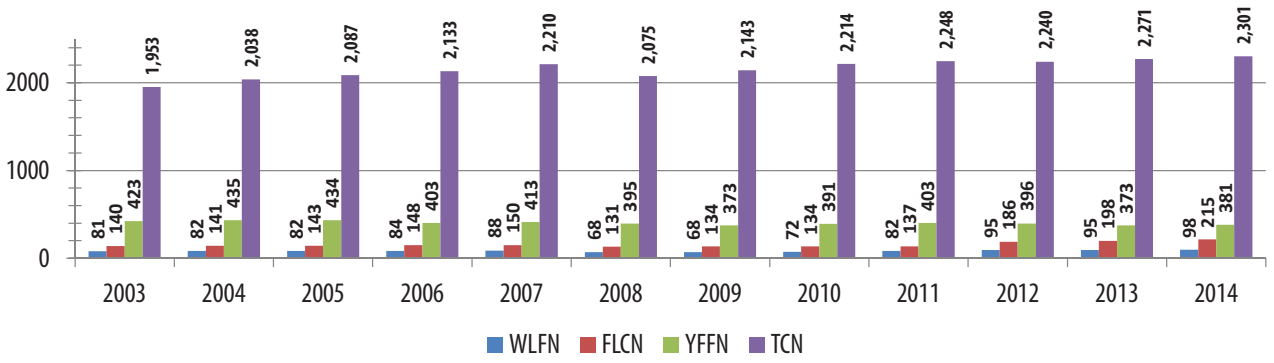
Partner First Nation Communities

Based on data from Aboriginal Affairs and Northern Development Canada, from December 31, 2003 to December 31, 2014, the total on-reserve population at TCN increased by 348 people; the total on-reserve population at WLFN increased by 17 people; the total on-reserve population at YFFN decreased by 42 people and the total on-reserve population for FLCN increased by 75 people.

This represents an average annual growth rate of 1.6% for TCN; 1.9% for WLFN; -0.9% for YFFN and 4.9% for FLCN over the period.

A comparison of partner First Nations' on-reserve populations from 2003 to 2014 is as follows (all population statistics reported as of December 31, 2014).

Total On-Reserve Population at Partner First Nations



Source: Aboriginal Affairs and Northern Development Canada

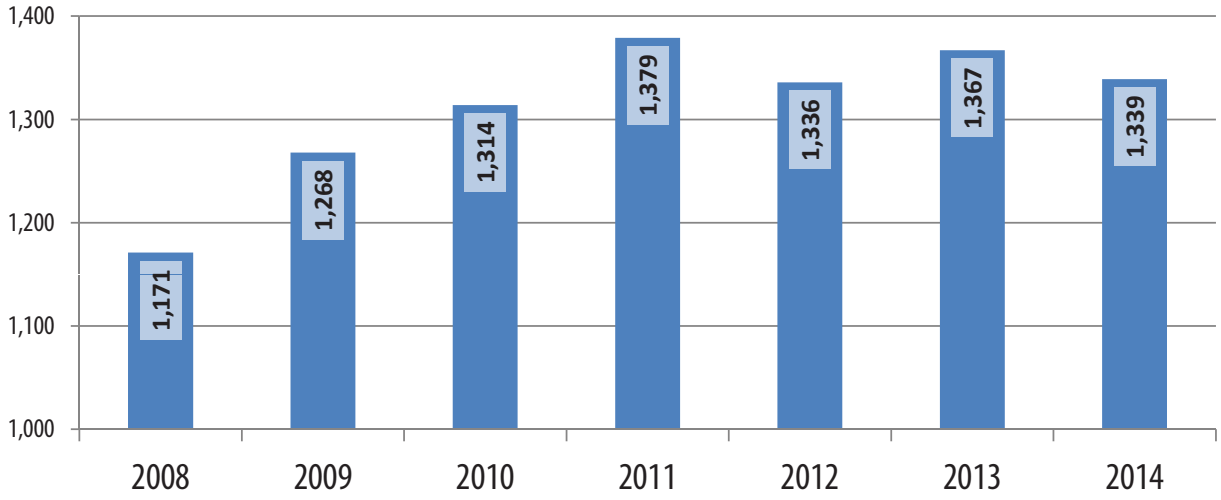

Worker surveying dewatered area

Town of Gillam

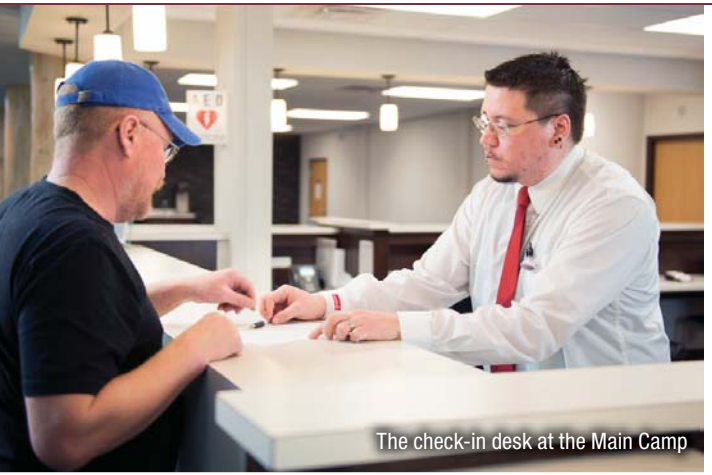
Based on data from Manitoba Health's annual health statistics, the total population at Gillam increased from 1,171 to 1,339, an increase of 168 people, between June 1, 2008 and June 1, 2014. This represents an average annual growth rate of 2.4% over the period.

A comparison of the Gillam population from 2008 to 2014 (as of June 1) is shown here.

Gillam Population (2008–2014)



Source: Manitoba Health



The check-in desk at the Main Camp

Housing, Infrastructure and Services

A small amount of new Project construction-related demand for housing in the partner First Nation communities and Gillam is anticipated. Also, minimal effects on infrastructure and services in the communities are expected. Given Gillam's proximity to the construction site as well as other Manitoba Hydro projects currently underway, it is anticipated that Gillam may experience effects on infrastructure and services associated with short-term influxes of construction workers. Monitoring will determine Project-related changes to demand on housing, infrastructure and services.

One-time Key Person Interviews will take place during project construction to identify any apparent project effects on housing or infrastructure and services in the partner First Nations' communities.

Monitoring will also be undertaken to understand the effects non-local construction workers have on the demand for infrastructure and services in Gillam. Information related to such impacts is anticipated to be available through the established Gillam Worker Interaction Subcommittee.

Public Safety and Worker Interaction

A Worker Interaction Subcommittee was established by Manitoba Hydro prior to the beginning of Keeyask construction. This Subcommittee is part of a corporate-wide initiative to address anticipated increases in the Gillam area workforce resulting from Keeyask and other Manitoba Hydro projects being constructed in an overlapping timeframe.

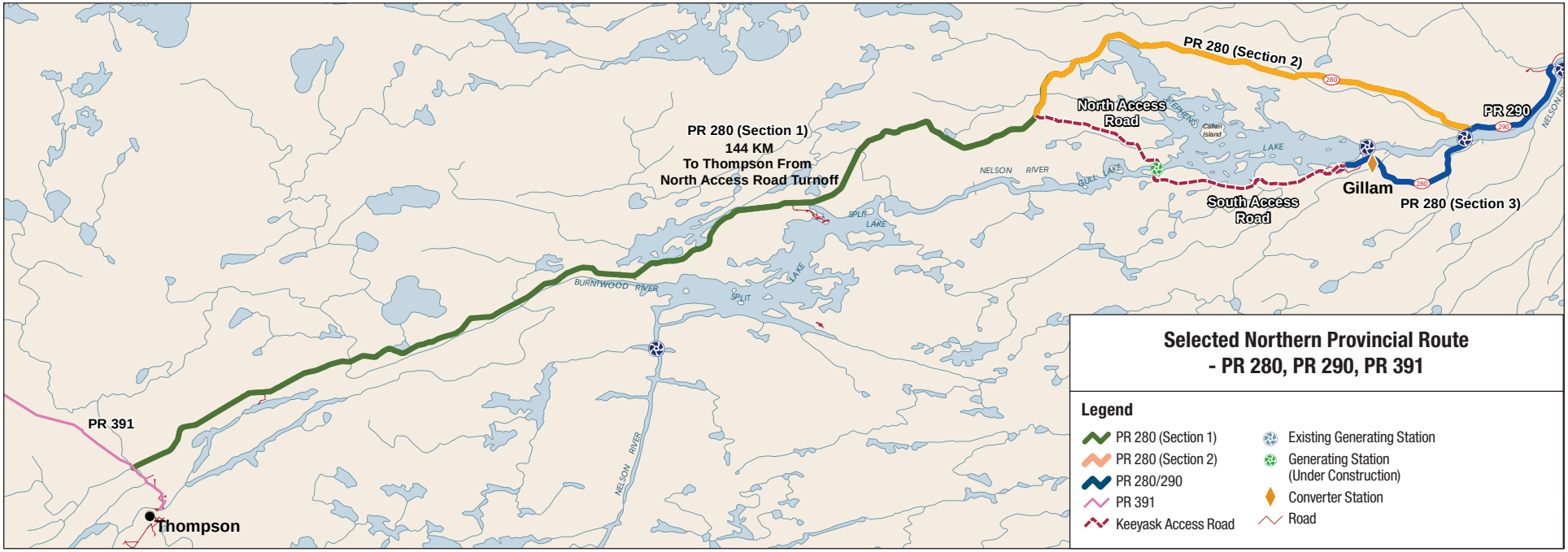
The Subcommittee is intended as a forum for information sharing and communication for early identification of potential worker interaction concerns, prevention of issues to the extent possible, and identification of ways to work cooperatively to address issues as they arise. In addition to Manitoba Hydro, FLCN, and the Town of Gillam, other stakeholder members are determined on an as-needed basis.

In the period between the beginning of Keeyask construction and March 31, 2015, the Subcommittee met twice, in September and December of 2014.

Transportation Infrastructure, Travel, Access and Safety

While the EIS predicted that existing transportation networks and plans for PR 280 upgrades would be able to accommodate the changes associated with Project construction, community concerns remain regarding traffic safety and road conditions. Therefore, monitoring efforts are being undertaken with information available from Manitoba Public Insurance (MPI) and Manitoba Infrastructure and Transportation (MIT), to assess EIS predictions and respond to community concerns. Traffic volume information was obtained from the Manitoba Highway Traffic Information System (MHTIS) website. This information is based on data collected by MIT for PR 280 and PR 290 every two years and includes estimates of annual average daily traffic, which is the number of vehicles passing a point on an average day of the year.

Traffic data from the MHTIS for PR 280 between PR 391 and the PR 280/PR 290 intersection is divided into two segments; PR 391 to Split Lake and Split Lake to the PR 280/PR 290 intersection. A summary of the annual average daily traffic for these segments of PR 280 for past years (rounded to the nearest five) can be seen in the PR 280 Traffic Volumes table on the next page.




North Access Road gate

Collision data for PR 280 for the years 2005 to 2014 were provided by MPI. There were a total of 118 collisions on PR 280 between 2005 and 2014; an average of 11.8 collisions per year. Collisions during the spring (March, April and May) and fall (September, October and November) months were most frequent, accounting for 63% of all collisions over the ten-year period. Single vehicle collisions were most frequent, accounting for approximately 92% of all collisions during the analysis period. Of the total collisions reported along PR 280 over the ten year period, <5 were fatalities and 28 were non-fatal injuries.

The Keeyask North Access Road connects Provincial Road 280 to the construction site. It is a private road with restricted access, which is controlled by a security gate at the PR 280/access road intersection. The gate office is staffed 24 hours per day, seven days per week and security staff document all authorized vehicles entering and exiting the road. Monitoring of traffic volume on the access road takes place through the gate's records and through security reports from patrols.

PR 280 Traffic Volumes

Highway	Segment	Annual Average Daily Traffic					
		2003	2005	2007	2009	2011	2013
PR 280	PR 391 to Split Lake	230	155	135	175	210	270
	Split Lake to PR 280/290	115	95	95	120	140	160

Keeyask Monthly Access Road Traffic Volumes

	2014					2015			
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Summary
Total	2,919	3,425	3,008	2,531	2,124	2605	2693	3759	23,064
Daily Average	94	114	97	84	69	84	96	121	95

The table above provides a summary of traffic use on the North Access Road from August 2014 to March 31, 2015. On average, 95 vehicles per day used the road during this period. These numbers provide information to measure and identify changes that may be related to the Project.

MIT is responsible for the existing provincial highway system, including the maintenance and upgrading to PR 280. MIT collects traffic data, using temporary electronic counters, on PR 280 and on PR 290 every two years. The temporary counters are intended for short duration studies as they cannot be used in winter

temperature and are prone to damage, wearing and displacement. Discussions occurred with MIT to install two permanent counters on PR 280 between PR 391 and the North Access Road and a third on PR 290 north of the PR 280/PR 290 intersection. Permanent traffic counter installation will occur in 2015. They will be in place until the end of construction. The proposed counter installations are magnetic induction loops and the permanent traffic count stations will provide continuous traffic count and vehicle classification information on a year-round basis for the duration of construction.

As mentioned previously, partner First Nations' communities have expressed concern about the quality and safety of PR 280. In response, MIT is undertaking a number of construction projects and enhanced maintenance plans to address these concerns. MIT also established the PR 280 Advisory Committee in the Fall of 2014. The committee is comprised of representatives from the Province of Manitoba, Manitoba Hydro, the Town of Gillam and the partner First Nations' communities to involve the latter directly in the planning of upcoming upgrades to PR280.

North Access Road

Culture and Spirituality

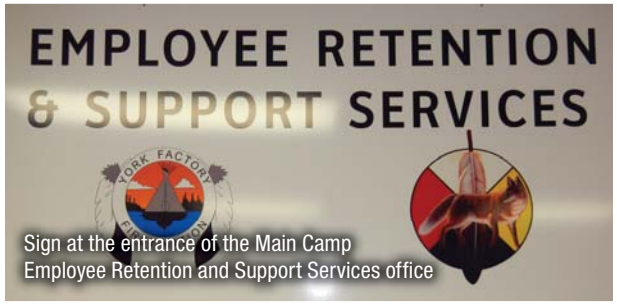
Culture and spirituality is being monitored to assess how employment experience during construction affects the culture of workers and their families.

Aboriginal Awareness Activities and Retention Support Programs

Since the start of construction, various measures were put in place to support the retention of northern and Aboriginal employees at the job site, and to ensure that sensitivity and respect for local culture is maintained throughout construction of the Project. These measures include orientation sessions for partner First Nation Members, on-site Aboriginal awareness training for employees, voluntary counseling services and cultural ceremonies marking key construction activities. These are being delivered through the Employment Retention and Support Services contract where the scope was developed jointly between Manitoba Hydro and the Fox and York Keeyask Joint Venture Company who endeavouredto include all partner First Nation interests. The Employment Retention and Support contractor began delivery of services during the Keeyask Infrastructure Project and continued into the Keeyask Generation Project.

Partner First Nations Members Orientation

The purpose of these orientation sessions, delivered in the communities, is to prepare partner First Nations' Members for the construction camp experience and enhance their prospects of achieving the benefits from employment on the Project. The focus is on key factors that affect the economy, culture and social conditions of each community. This includes the historical and ongoing effects of hydro development and relationships with Manitoba Hydro.



Sign at the entrance of the Main Camp Employee Retention and Support Services office

Aboriginal Awareness Training

On-site training workshops are provided for staff working at the Keeyask site. The purposes of training workshops are to:

- increase understanding and appreciation of the cultural differences, beliefs and values of individuals within the various parties/communities working at the site;
- enhance comfort in living, working and/or doing business in a culturally diverse environment;
- identify barriers and issues between the various parties working at the site;
- identify common goals;
- develop strategies and an action plan for addressing issues/barriers, reaching common goals and developing and maintaining long-term harmonious relationships;
- increase participants' understanding of contemporary issues facing Aboriginal peoples;
- challenge participants to re-think their assumptions and personal biases about Aboriginal peoples, and
- provide participants with information that will promote understanding and respect of Aboriginal cultures, enabling participants to work effectively with Aboriginal peoples.

On-site Counseling

On-site counseling is available to help all employees, on a voluntary basis, to deal with any issues experienced while working on the Project. This could include, for example, work adjustment problems, vocational/career issues, cultural adjustments, family stresses and money management. The intent is to reduce attrition for all Project workers, but particularly for Northern Aboriginal workers of Cree heritage, by assisting them in dealing with challenges directly affecting their work performance.

Cultural Site Ceremonies

Site ceremonies are being held at key construction milestones to help mitigate the effect of the Project on partner First Nations' culture, and to demonstrate respect for the land and all that is supported by the land. Attendance at ceremonies is welcome and voluntary, and consists of various community members at large and staff of the contractors and Manitoba Hydro. Between the beginning of July and end of March, there was one ceremony held for the cofferdam construction (first in-water work in 2014).

Mercury and Human Health

Mercury is a metal found naturally in small amounts in rock, soil, water, living organisms, as well as in synthetic products. Flooding of forested lands with soils with high organic content, or flooding of wetlands, commonly results in a temporary increase in mercury (in the form of methylmercury) in the water, and subsequently in the organisms that live and use those environments. The vast majority of mercury exposure to people occurs through the consumption of fish.

Because Project effects of mercury in the reservoir, and to a lesser extent in Stephen's Lake, will occur post-flooding, the majority of related monitoring will occur in the operation phase. Mercury levels in fish from Gull Lake are expected to peak three to seven years after impoundment in 2019 and then to decline over the next 20 to 30 years until they reach pre-Project levels or stable concentrations. The Partnership has prepared a Mercury and Human Health Risk Management Plan in consultation with provincial and federal regulators, in order to identify, assess, respond to, communicate and monitor risks to human health from increased mercury in the environment as a result of the Project. The goals of future monitoring include activities to support discussion and build understanding around mercury and fish; to allow individuals and families to confidently assess and manage the benefits and risks associated with eating wild fish in the Project area; to support and enhance local practices of fishing for sharing, and eating wild-caught fish at levels that are healthy for all community members.

Monitoring of pickerel for mercury will occur when the Project is in operation

Heritage Resources Protection and Mitigation

The Construction Heritage Resources Protection Plan (HRPP) sets out the KHLP's commitment to safeguard heritage resources and appropriately manage human remains or heritage objects discovered or disturbed during the development of the Project. No human remains were found between July 2014 and March 31, 2015.

On August 11, 2014, a field crew working on Caribou Island came across what appeared to be bones. The crew immediately stopped all work, flagged the area and noted the GPS location. The area was then reported to Manitoba Hydro's Site Environmental Lead, who proceeded to contact the Project Archaeologists, as per the HRPP. On August 12, 2014, the Project Archaeologist was taken by boat to the site to examine the bones and bone fragments. It was determined that the bones were from either a caribou or a moose, therefore no further action was required, and work could proceed. This was the only incident that triggered activation of the HRPP in 2014-15.

In addition to implementation of the HRPP as required, the Partnership protects heritage resources in the Project area through other measures.

In August and September of 2014, the Project's archaeological team conducted surveys of two dewatered cofferdam areas to recover any heritage resources that may be present on the newly exposed riverbed. No heritage resources were located during the surveys.

In September 2014, the Project's archaeological team excavated the "Gull Lake Cabin" site. Over 2,500 artifacts were recovered and indicated that the site was occupied from approximately 1920 to 1950. The Project archaeological team implemented an intensive shovel testing program at the "Bechonea" site. This included 34 test excavations, of which five were positive for heritage resources. The artifacts discovered were recovered and documented.

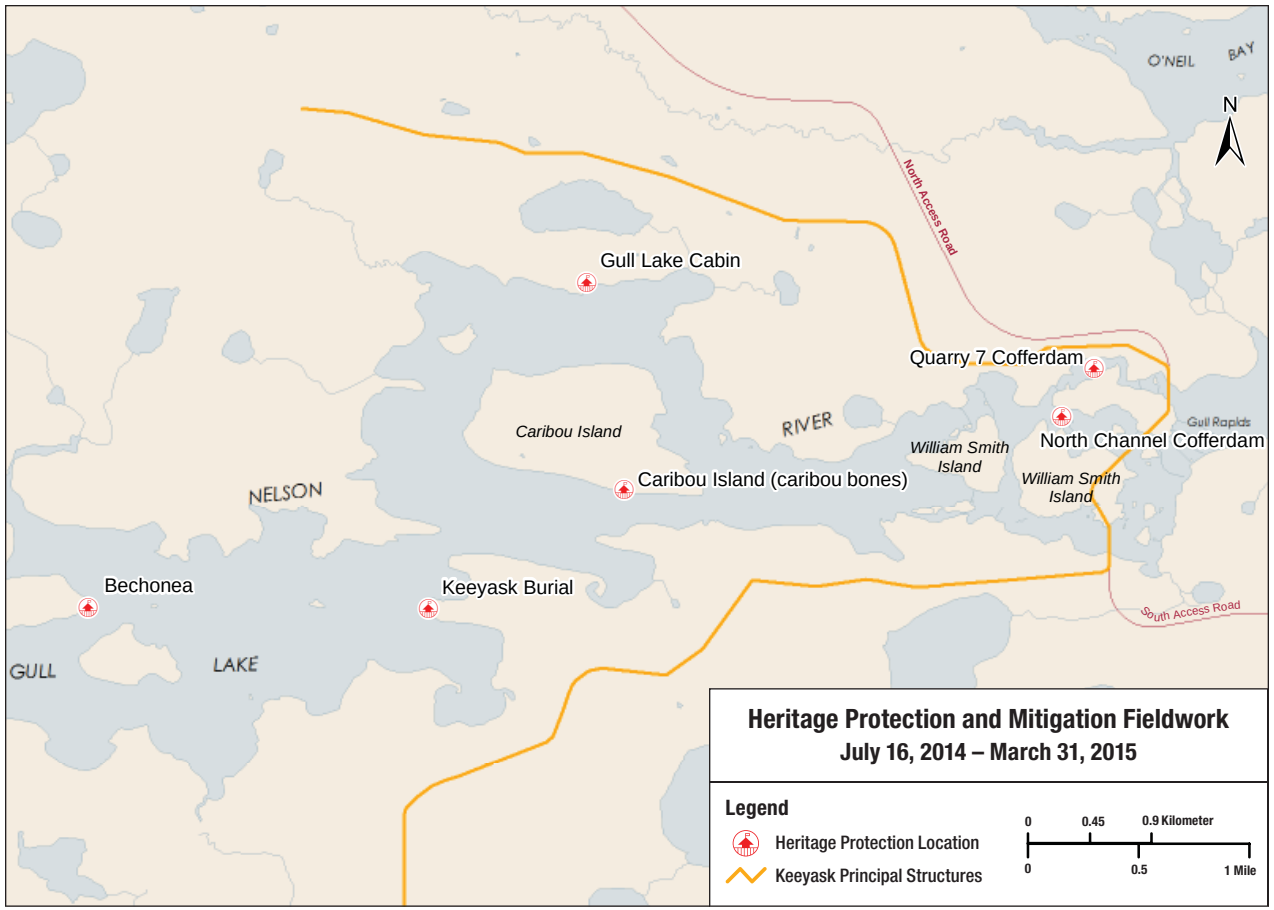

Excavation of the Gull Lake Cabin site

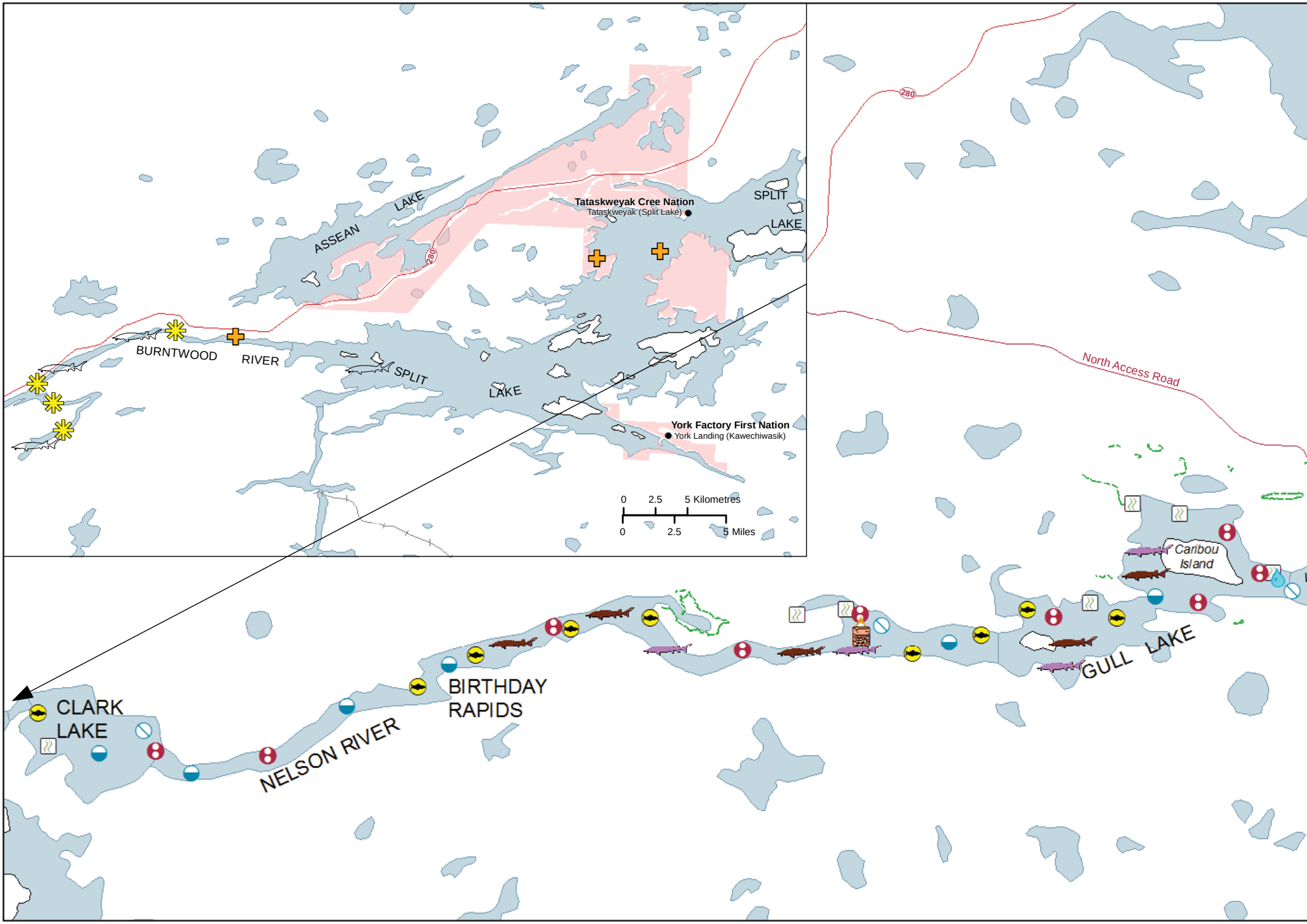

Test excavation at Bechonea site

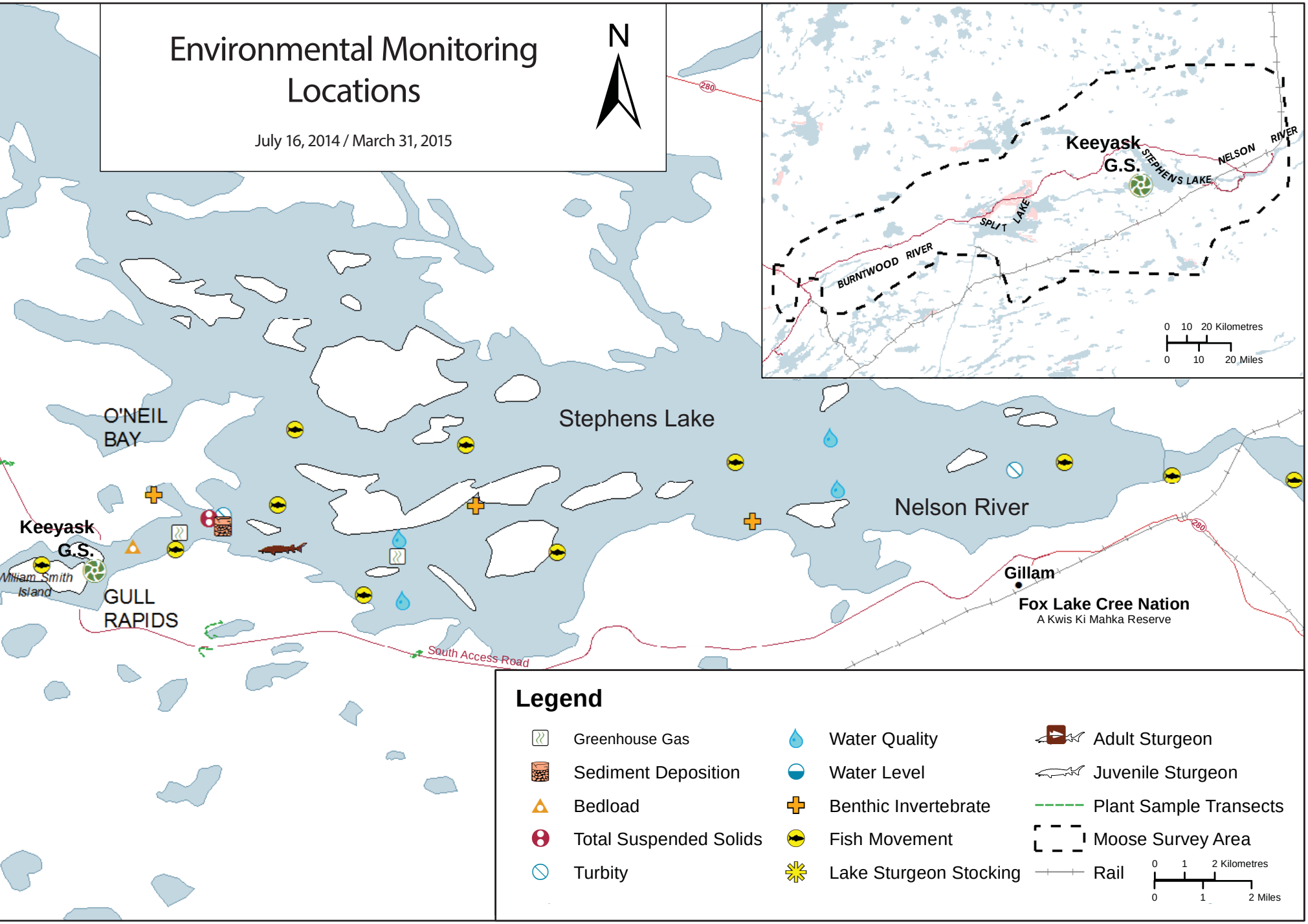
Surveying Quarry 7 for heritage resources

During 2014-15, TCN representatives, in consultation with the other Project partner representatives, confirmed the site of the Keeyask cemetery to be located adjacent to the North Access Road and participated in the design and layout of the cemetery. The cemetery is intended for the reburial of any humans remains found in the Project area during the construction and operation of the Keeyask Generation Project. A memorial, consistent with local culture and spirituality, is also planned at the cemetery site to pay tribute to those who died previously in the vicinity of the Project area, so that they may be remembered.

The map on the right shows the locations of the heritage mitigation field work conducted in 2014.

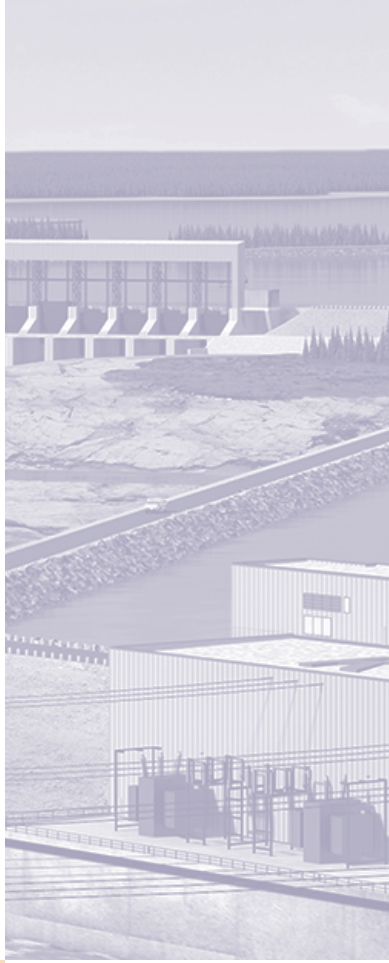



ASSEAN LAKE
Tataskweyak Cree Nation
Tataskweyak (Split Lake)
SPLIT LAKE
280
BURNTWOOD RIVER
SPLIT LAKE
York Factory First Nation
York Landing (Kawechiwasik)
0 2.5 5 Kilometres
0 2.5 5 Miles
North Access Road
Caribou Island
GULL LAKE
CLARK LAKE
NELSON RIVER
BIRTHDAY RAPIDS


Environmental Monitoring Locations
July 16, 2014 / March 31, 2015
N
Keeyask G.S.
STEPHEN'S LAKE
NELSON RIVER
SPLIT LAKE
BURNTWOOD RIVER
0 10 20 Kilometres
0 10 20 Miles
O'NEIL BAY
Stephens Lake
Nelson River
Keeyask G.S.
William Smith Island
GULL RAPIDS
South Access Road
Gillam
Fox Lake Cree Nation
A Kwis Ki Mahka Reserve
Legend
Greenhouse Gas
Sediment Deposition
Bedload
Total Suspended Solids
Turbity
Water Quality
Water Level
Benthic Invertebrate
Fish Movement
Lake Sturgeon Stocking
Adult Sturgeon
Juvenile Sturgeon
Plant Sample Transects
Moose Survey Area
Rail
0 1 2 Kilometres
0 1 2 Miles

KEEYASK

Hydropower Limited Partnership



KEEYASK
Hydropower Limited Partnership

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