Environmental Report

Wabageshik Rapids

(Vermilion River)

Hydroelectric Generating Station Project

FOREWORD

The Final Environmental Report

Xeneca Power Development Inc. (Xeneca), the project proponent, is pleased to present the Final Environmental Report (ER) for the proposed Wabageshik Rapids Hydroelectric Generating Station on the Vermilion River (the "project"). This document represents the culmination of important and considerable joint effort among Xeneca, regulatory agencies, local residents, public stakeholders and Aboriginal communities over the last four years. It was prepared to meet the requirements of the Ontario *Environmental Assessment Act* and the objectives of the *Green Energy Act*.

One function of this Final report is to advise the public and government ministries and agencies on the outcomes of the completed studies and consultations. Xeneca has welcomed comments and questions about the proposed project throughout the ER preparation period.

Submission of this final report under the Waterpower Class Environmental Assessment (EA) process represents a significant milestone in the obligations to the Ontario Power Authority under the Feed-In Tariff (FIT) contract issued to Xeneca for this undertaking. In order to initiate construction, Xeneca is required to successfully satisfy the requirements of the Waterpower Class EA, and subsequently obtain all applicable provincial and federal regulatory permits and approvals; receive approval for final engineering design; and obtain approval of detailed plans and specifications, all within a relatively aggressive schedule. Xeneca has undertaken a multitude of investigations and studies of the project site spanning a four year period (2010, 2011, 2012, and 2013) that has included natural habitat studies; archaeological investigations; water quality and fish tissue sampling; geotechnical studies; public and agency consultation; and engagement with Aboriginal communities. Xeneca is pleased with the contribution of all agencies in reaching this milestone and looks forward to a continued positive working relationship on the detail design, permitting and construction parts of the project to meet the FIT program contractual agreements to have the project in-service by October 2018.

Advancing Provincial Strategies

The government of Ontario has stated many times that a reliable supply of clean energy is necessary to maintain a strong economy and a healthy and prosperous quality of life for Ontario's growing population.

The provincial government has also placed a priority on expanding the amount of energy produced from renewable energy sources. Renewable energy development is a cornerstone of the province's future prosperity and its commitment to protecting the environment. The Ministry of Natural Resources (MNR) has stated that renewable energy projects contribute to the environmental, social and economic wellbeing of the province. Renewable projects such as

waterpower help reduce the impacts of climate change and provide sustainable sources of energy. Supporting the government's green energy initiative, the MNR makes Crown land available for renewable energy development including waterpower (Ministry of Natural Resources, http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@renewable/documents/document/stdprod_087667.pdf). The proposed Wabageshik project helps fulfill the MNR mandate to support the government's green energy initiative.

Waterpower continues to help to fuel Ontario's growth and is the backbone of Ontario's renewable power supply. In 2011, 22% of electricity generated in Ontario came from hydroelectric facilities. Waterpower has a number of benefits over other sources of clean energy since it can easily respond to sudden changes in energy needs and the facilities generally have long life cycles, on the range of 75 to 100 years. Waterpower is a reliable, clean, local and naturally recurring source of energy. The Ministry of Energy document referenced below notes the additional benefit of water level and flow management provided by reservoirs and dams that help to support recreational activities and contribute to public safety by minimizing flooding (Ministry of Energy, http://news.ontario.ca/mei/en/2010/08/waterpower-projects-support-local-communities.html).

Waterpower is a key contributor to implementing the Ontario government's 20-year Long-Term Energy Plan, Building Our Clean Energy Future. This plan includes building the largest expansion in hydroelectric power in almost 40 years (Ministry of Energy, http://news.ontario.ca/mei/en/2011/02/long-term-energy-plan-takes-another-step-forward.html). The government of Ontario has committed to continue to grow its hydroelectric capacity with a target of 9,000 MW by adding new facilities and maximizing the use of Ontario's existing facilities. The proposed Wabageshik project will help to fulfill this commitment.

Renewable energy development is a cornerstone of the province's future prosperity and its commitment to protecting the environment. The Ministry of Natural Resources (MNR) has stated that renewable energy projects contribute to the environmental, social and economic wellbeing of the province. Renewable projects such as waterpower help reduce the impacts of climate change and provide sustainable sources of energy. Supporting the government's green energy initiative, the MNR makes Crown land available for renewable energy development including waterpower (Ministry of Natural Resources, http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@renewable/documents/document/stdprod_087667.pdf).

Moving Forward

This Final Environmental Report is the foundation of Xeneca's planning and development process that will be used to inform the subsequent detail design and permitting/approval stages.

This document is also a record of the binding commitments of Xeneca as it proceeds with development and operation of the proposed project.

EXECUTIVE SUMMARY

Xeneca Power Development Inc. (Xeneca), the proponent, proposes to construct a 3.4 MW hydroelectric power generating station (GS) at the site known as "Wabageshik Rapids" on the Vermilion River (the "project"). The site is located approximately 50 km southwest of the City of Sudbury, 11 km east of Espanola, and 6 km south of the Trans-Canada Highway (17); within the Township of Foster. This Final Environmental Report (ER) describes the environmental assessment carried out as part of the planning process for the proposed project.

The project received a Feed-in Tariff (FIT) contract from the Ontario Power Authority (OPA). With an initial capital construction cost of $27 million, the project represents a socio-economic benefit to the local community at the construction phase. Provincially, the project would return approximately $8.5 million in tax revenues to the province during the life of the forty year contract.

This Final ER documents the environmental assessment (EA) process undertaken in support of the proposed project. This EA was completed in accordance with the provincial Class Environmental Assessment for Waterpower Projects as required under the *Ontario Environmental Assessment Act*. The purpose of an EA is to ensure that potential effects are identified, evaluated and considered in the planning stages of a project, allowing for the avoidance or minimization of the negative impacts and the optimization of the positive impacts in advance of the regulatory permitting phase that governs the construction and operation phases. The EA process is designed to ensure the proponent of a project undertakes meaningful engagement of all parties who wish to be involved in the planning process. In the context of an environmental assessment, the environment includes the natural/physical, socio/economic, and cultural/human landscape in which the project is proposed.

This Final ER has been organized in the following format:

- Introduction and project overview, including a detailed description of the Zone of Influence;
- Description of the regulatory framework under which the project is being assessed;
- Identification of the existing conditions of the environment in which the project is situated;
- A technical description of the proposed project as conceptualized, including its physical makeup, construction requirements, and proposed operational regime;
- Discussion of stakeholder engagement efforts undertaken throughout the EA process, and the results of those engagements;
- Identification of the likely effects of the project both positive and negative, proposed mitigation measures to avoid the negative impacts, residual effects, compensatory measures where required, and proposed construction, and operational monitoring initiatives;

- Identification of anticipated regulatory approvals which will be required prior to the construction and operation phases of this undertaking;
- Conclusions and Recommendations.

An environmental assessment is meant to enhance the project as it is conceptualized through site specific investigations in consultation with regulatory bodies; First Nation and Aboriginal communities; other interested parties; and the general public. The EA presents a conceptual project design to inform on the general scope of the project both in terms of potential impacts to the environment and anticipated socio-economic benefits of the project. A final detailed project design is required in support of securing regulatory permits and approvals.

The proposed mitigation measures have been developed using recognized industry standards and best management practices, through the discipline expertise of the EA team members, and in accordance with the regulatory framework which governs the proposed project. Xeneca will continue to work closely with provincial and federal regulators during the formal review of this document, and through the detailed design, permitting, construction, and operational phases of the project. Xeneca is committed to verification of the implementation and effectiveness of the mitigation measures and compensatory measures detailed in this document. As part of this effort, Xeneca will regularly issue a Project Implementation Report to agencies to update the project status, provide results of on-going environmental assurance and verification programs, and provide results of monitoring and mitigation programs.

Throughout the environmental planning process, Xeneca has endeavoured to understand the environment in which the project would be built by undertaking an extensive information and data collection program. Data on areas of the environmental setting of the project was collected by discipline experts including:

- Stage 1 and 2 archaeological assessments;
- A natural environment characterization and impact assessment;
- A high level erosion study and fluvial geomorphic assessment on the riverine system in the zone of influence;
- Database analysis and mapping ;
- Wetland assessment and flyover to route the connection line and access roads;
- A statistical analysis of historical hydrological data;
- Hydraulic analyses;
- Conceptual engineering design; and
- Baseline surface water quality program.

A comprehensive agency and public consultation program also contributed key information towards the identification of the potential adverse and positive environmental effects of the project.

Aboriginal and First Nation engagement was undertaken with each community's leadership as part of the business to business Aboriginal consultation initiative by Xeneca. A comprehensive engagement initiative with each community located within, or having traditionally used the project area has been underway since the issuance of the Notice of Commencement and will continue into project implementation.

Throughout this document, management strategies have been developed and applied to known impacts in order to avoid, prevent or minimize any identified adverse environmental effects of the project. Loss or alteration of aquatic habitat is anticipated to occur in the proposed inundation area, the facility footprint, and in a portion of the Vermilion River downstream. Therefore, to offset this loss, compensation habitat will be created downstream of the facility and will be monitored for the first five years of operation to verify that the newly-created habitat is functioning as intended or to make modifications as necessary.

Additionally, it is Xeneca's belief that the MNR's fisheries management objectives can be achieved without providing upstream passage for Walleye and Lake Sturgeon, as required habitat for these species are available and can be enhanced downstream of the facility. Agreement with the MNR on an acceptable approach will be achieved during the permitting and approvals process. The location and nature of the proposed compensation habitat for these anticipated impacts will be further developed and discussed with DFO and the MNR once the engineering details for the project have been advanced during the permitting phase of the project.

There are also many positive environmental effects associated with the project which are considered to off-set the potential adverse environmental effects associated with the project. These include:

- Tangible Economic Outcomes for the Local Communities and the Regional / Provincial Economy:
    - Benefit to the local Sustainable Forest Licence holder (Domtar Inc. EACOM (Pineland Forest Management Unit)) by sale/processing of merchantable timber along the connection line and access road right-of-ways, and the merchantable timber to be harvested from the area of inundation.
    - Job creation during construction both directly and indirectly in the near North Region of Ontario. Direct employment (construction only) for waterpower projects is estimated at 10,000 person hours per MW; indirect jobs multiply by 1.5; and up to two (2) part time jobs will be available in the operation and maintenance of the facility.
    - An increase in economic activity (direct and indirect) to build the project procuring everything from consulting and legal services to concrete, steel, trucking and other services such as lodging, food and fuel. The majority of this activity will be created within the local/regional economy.

- Employment and training opportunities (planning, construction and operation phases of the project);
- Creation of reliable and secure green energy for the province and reduced greenhouse gas emissions:
    - The project will reduce CO_2 emissions by eliminating the need for an equivalent amount of electricity to be produced through the combustion of fossil fuels.
- Benefits to the population, commerce and industries of Ontario by providing more reliable and consistent renewable power to the provincial grid for many years to come. Many power plants built in the early 1900s are still in operation and with regular maintenance and upgrades can last for generations to come.
- The operation of the facility in the existing power grid will be compatible with the overall power system reliability and power quality (voltage and frequency) objectives while improving distribution customer service reliability in this area, from a sustainable and consistent power source.
- The generation of electricity through a renewable energy supply in support of the province's *Green Energy Act*.

Preliminary planning discussions that will contribute to the development of specific management strategies are outlined in this document, and the proponent will continue to work with the regulators and other interested parties in support of securing approvals for this undertaking. There may be a requirement from DFO for an authorization under Section 32 of the *Fisheries Act*. Final details of the authorization and approvals for the compensation measures plan will be finalized in consultation with DFO and other agencies. The application of the recommended management strategies and adherence to the identified commitments by Xeneca will contribute to a sustainable renewable energy development project.

Conclusion

It is the conclusion of this environmental assessment that there will be no significant negative residual environmental effects after application of mitigation measures and compensation measures, and Xeneca believes there will be a net environmental and economic benefit.

There are also positive environmental effects associated with the project which are considered to off-set any potential environmental impacts as described above.

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Acronyms

AANDC	Aboriginal Affairs and Northern Development Canada (formerly Indian and Northern Affairs Canada)
ARD	Acid Rock Drainage
AST	Above-ground storage tank
ATV	All-Terrain Vehicle
BMA	Bear Management Areas
CEAA	*Canadian Environmental Assessment Act*
CEA Agency	Canadian Environmental Assessment Agency
CMP	Construction Management Plan
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EAA	*Environmental Assessment Act*
EC	Environment Canada
EDSC	Espanola and District Snowmobile Club
ELC	Ecological Land Classification
ESA	*Endangered Species Act*
ER	Environmental Report
FEAC	Federal Environmental Assessment Coordinator
FIT	Feed-In Tariff
FMP	Forest Management Plan
FN	First Nation
GEA	*Green Energy Act*
GIS	Geographic Information Systems
GRC	Gross Revenue Charges
GS	Generating Station
HADD	Harmful alteration or disruption, or the destruction, of fish habitat
HEC-RAS	Hydrologic Engineering Centers River Analysis System
LTAF	Long term annual flow, average annual mean
Ltd.	Limited
LRIA	*Lakes and Rivers Improvement Act*
masl	Metres above sea level
ME	Ministry of Energy
MNDM	Ministry of Northern Development and Mines
MNR	Ministry of Natural Resources
MNO	Métis Nation of Ontario
MOE	Ministry of the Environment
MOU	Memorandum of Understanding
MSDS	Material Safety Data Sheet
MTCS	Ministry of Tourism, Culture and Sport

MTO	Ministry of Transportation
NBO	National Building Code
NF	NorthShore Forest
NOC	Notice of Commencement
NRCan	Natural Resources Canada
NRSI	Natural Resource Solutions Inc.
NWPA	*Navigable Waters Protection Act*
OBC	Ontario Building Code
OFAH	Ontario Federation of Anglers and Hunters
OFSC	Ontario Federation of Snowmobile Clubs
OPA	Ontario Power Authority
ORA	Ontario Rivers Alliance
OPG	Ontario Power Generation
OSHA	Occupational Safety and Health Association
OWA	Ontario Waterpower Association
PC	Point of Connection
PCC	Point of Common Coupling
PIC	Public Information Centre
PWQO	Provincial Water Quality Objectives
Q_{99}	Streamflow exceeded 99% of time
Q_{95}	Streamflow exceeded 95% of time
Q_{80}	Streamflow exceeded 80% of time
Q_{50}	Streamflow exceeded 50% of time
Q_{20}	Streamflow exceeded 20% of time
Q_{EA}	Downstream environmental flow target
Q_{COMP}	Compensatory flow (between dam and tailrace)
Q_{MED}	Median streamflow value
Q_{TMAX}	Maximum turbine capacity
Q_{Tmin}	Minimum turbine flow
Q_{TL}	Maximum turbine flow during intermittent operations
Q_{HWM}	Streamflow corresponding to high water mark
7Q2	2 year return period 7-day-average-low flow
7Q10	10 year return period 7-day-average-low flow
7Q20	20 year return period 7-day-average-low flow
Q1:2	High streamflow event; occurrence of 1 in 2 yr
Q1:100	High streamflow event; occurrence of 1 in 100 yr
RA	Responsible Authority
RCSA	Rainbow Country Snowmobile Association
RIN	Riverine Index Netting
ROR	Run-of-river
ROW	Right-of-way

RSFDP	Resource Stewardship and Facility Development Projects
SA	Sagamok Anishnawbek
SAAS	Streamflow Analysis and Assessment Software
SAR	Species at Risk
SARA	*Species at Risk Act*
SFL	Sustainable Forest License
SWH	Significant Wildlife Habitat
SIP	Site Information Package
SVRWMP	Spanish/Vermilion Rivers Water Management Plan
TC	Transport Canada
TK	Traditional Knowledge
TSS	Total Suspended Solids
UCCM	United Chiefs and Councils of Mnidoo Mnising
UOI	Union of Ontario Indians
UTM	Universal Transverse Mercator Units
UWCO	United Walleye Clubs of Ontario
VEC	Valued Ecosystem Component
VRS	Vermilion River Stewardship
WHMIS	Workplace Hazardous Materials Information System
WHS	Woodland Heritage Services
WLFN	Atikameksheng Anishnawbek (Whitefish Lake First Nation)
WRFN	Whitefish River First Nation
WMP	Water Management Plan
WMU	Wildlife Management Unit
ZOI	Zone of Influence

Units

°C	degrees Celsius
cm	centimetre
ha	Hectare
km	kilometres
km^2	kilometres squared
kV	kilovolt
kW	kilowatt
kWh	kilowatt hour
m	metres
mm	millimetres
m^2	square metres
masl	metres above sea level
mg/L	milligram per Litre

m/s	metres per second
m^3/s	cubic metres per second
MW	megawatt
MWh	megawatt hour
r/min	revolutions per minute
µg	microgram

1. INTRODUCTION

This section presents an introduction to waterpower in Ontario, an overview of the proposed project, and the methods used to complete the work presented herein.

1.1. WATERPOWER IN ONTARIO

Hydroelectricity is generated from water, a naturally replenished source making waterpower both a renewable and sustainable resource. Waterpower currently accounts for approximately one-quarter of Ontario's installed capacity and electricity production (OWA Class EA, April 2012), and greenhouse gas emissions from a hydroelectric generating station are effectively zero. Waterpower generation provides peak and base load energy, which replaces non-renewable sources of power such as coal and gas. Some waterpower facilities are designed and operated to store energy (water) until it is needed for peak periods of usage.

Hydroelectric generating stations are long-lasting, operating for upward of eighty (80) years; there remain operating facilities within the province that were constructed at the turn of the 20th century. In 2009, the Ontario *Green Energy Act* (GEA) was enacted with the aim of making the province a global leader in clean, renewable energy. The Feed-In Tariff (FIT) Program administered by the Ontario Power Authority (OPA) was established under the GEA to encourage the development of renewable energy in Ontario while phasing out the province's coal-fired electricity by 2014. The FIT was designed to promote economic activity, the development of renewable energy technologies and the creation of new green industries and jobs.

1.2. INTRODUCTION TO PROJECT

Xeneca Power Development Inc. (Xeneca) is proposing the construction of a 3.4 megawatt (MW) hydroelectric generating station (GS) at Wabageshik Rapids on the Vermilion River in the Sudbury area. This project is proposed to meet government and energy objectives to generate sustainable and reliable hydroelectric power. The project was awarded a 40-year FIT contract from the OPA which, subsequent to a successful Environmental Assessment (EA) outcome and the ensuing permitting and approvals phase, would see the facility commissioned and delivering electricity to the provincial supply grid by October 2018. (*Note: in a June 26, 2013 directive to the OPA, the Minister of Energy stated that existing waterpower FIT contracts were to be offered a 3-year extension to the Milestone Date for Commercial Operation. Prior to the announcement of the 3-year extension, the Wabageshik Rapids GS had a commissioning date of October 2015.)*

The proposed project is located on the Vermilion River, approximately 50 kilometres (km) southwest of the City of Sudbury, 11 km east of Espanola, and 6 km south of the Trans-Canada

Highway (Highway 17). The project site falls within the Township of Foster. A site location map is presented as Figure 1.

1.2.1. Zone of Influence

For the purposes of this assessment, the zone of influence (ZOI) of the project consists of the areas which will be affected by the construction and operations of the facility. These areas include the facility, inundation zone, variable flow reach, construction area footprints, and access road and connection line right of ways. The ZOI includes:

The Wabageshik Rapids GS project involves the construction of a dam at a location approximately 800 metres downstream of the natural outlet of Wabagishik Lake. The dam will create a headpond extending upstream from the dam to the outlet of Wabagishik Lake. Once created, the headpond will be at the same water level as Wabagishik Lake.

To stakeholders and recreational users, the proposed headpond will look like part of the lake. Watercraft will be able to navigate from the lake to the dam without obstruction except for the natural shoal that will continue to exist below the water surface at the outlet of the lake. However, for purposes of the environmental assessment, the footprint of the man-made headpond consists only of the 800 metres of newly inundated area.

Once operational, any modification of flow that affects the headpond also affects the lake. Xeneca has proposed to carry out daily operation whereby more water is released during daytime hours than during nighttime hours. This aspect is described in detail in the Operating Plan in the ER (Annex I). This operation will cause both the headpond and the lake level to fluctuate throughout the day. Xeneca has firmly committed in the EA to limit such fluctuations in the lake to ± 5 centimetres (approximately ± 2 inches) from the natural daily lake level.

Xeneca has further committed to follow the natural change in lake level of about 1.5 metres throughout the year. Therefore, no monthly or seasonal modification from natural lake levels is proposed or required for the operation of the project. The engineering method for compliance with this commitment is described in the Operating Plan document in the ER (Annex I). See also Figure 5 of the Operating Plan for an illustration of both the natural lake level throughout the year and the amount of daily variation that can occur due to daily operation.

For the purposes of the EA process and public consultation, Xeneca defined the upstream ZOI to include the area inundated by the proposed headpond and the area of the lake affected by daily water level fluctuations. Maps, reports and communications to agencies, the public, and Aboriginal Communities, including poster boards and the ER document reflect this information accordingly. Xeneca believes this approach to defining the upstream ZOI is consistent with the MNR definition of ZOI and respectful of potentially affected stakeholders.

For the purposes of impact assessment, the ER distinguishes between the headpond and Wabagishik Lake as components of the upstream ZOI as the potential project effects on each differ. For the headpond, consideration was given to the impact of inundation and the related conversion from terrestrial and riverine habitats to lake-like habitat as well as operational effects associated with water level fluctuations. Also considered was any potential impact on riparian or adjacent land owner rights (although in this case, land adjacent to the headpond does not include private land). Effects on recreational uses (i.e. snowmobile trails, hunting, trapping, fishing, hiking, canoeing and camping) have also been considered. For the lake, consideration was given to potential impacts related to daily level fluctuations as they relate to ecological components or recreational uses. In addition, the commercial interests of the Lorne Falls generation plant at the upstream end of the lake were also considered. For the lake, daily water level fluctuations on riparian land rights were also considered.

Background on Downstream ZOI:

Due to the proposed daily operation of the Wabageshik Rapids GS, flows and levels downstream of the project will be modified from natural conditions. Throughout the day, the same total volume of water will be released as would have occurred under natural conditions. However, a larger portion of the water will be released during the day than at night. The result is that a flow alteration occurs downstream of the project that must be considered in the determination of the Downstream Zone of Influence (DZOI) extent.

The downstream reach of the Vermilion River enters the headpond of the Domtar Dam at a location known as Graveyard Rapids, approximately 3 km downstream of the proposed Wabageshik Rapids GS project. At 5 km downstream, the Vermilion River flows into the Spanish River. Hence, the confluence of the Vermilion River and Spanish River lies within the headpond of the Domtar Dam. The Domtar Dam is located on the Spanish River a short distance further downstream in the Town of Espanola. There are existing power generation facilities upstream of the Domtar headpond on both the Spanish River (Nairn Falls Dam) and the Vermilion River (Lorne Falls Dam). The Domtar Dam itself has a generating station and is actively operated on a daily basis such that the headpond levels are maintained within an approved range of fluctuation or "Operating Band." The existing operation of Domtar Dam, as it relates to level impacts upstream and flow variability downstream, defines the existing condition from which any additional flow alteration is assessed.

The existing condition from Graveyard Rapids to Domtar Dam consists of daily changes in water levels that are related to a combination of factors, including natural changes in flows, operating releases from upstream water control structures and the daily operation of Domtar Dam itself.

Extensive engineering work and hydraulic modeling has been done to define the scope and extent of the downstream flow alteration of the proposed project and in the context of the rather complex existing natural and man-made conditions. Specifically, the following work was undertaken:

- The proposed operation and flow alteration at Wabageshik Rapids was defined in detail in the Operating Plan document. The daily operating profiles were developed, defining how the facility will operate under a wide range of natural inflow conditions [See Annex I of this ER for the Proposed Operating Plan & Water Management Plan Amendment Wabageshik Rapid Small Waterpower Project (Draft), Ortech Consulting Inc. July 2013].

- Hydraulic modeling studies were carried out to determine the variability in flows and levels that would occur downstream and how quickly the alteration would attenuate with distance downstream (See Annex I of this ER for the following studies: Ontario South Hydro HEC-RAS Inundation Mapping Vermilion River – Wabagishik Rapids, Canadian Project Ltd, March 29, 2012; Vermilion River Site #6 – Wabagishik Rapids HEC-RAS Unsteady Flow Modelling, Canadian Projects Ltd., July 10, 2012 and Vermilion River Site #6 – Wabagishik Rapids Additional Peaking Scenarios - Hydraulic Modeling, Canadian Project Ltd., June 24, 2013).

- Engineering analysis (included in Annex I) and consultation with regulators and Domtar (included in Appendix C and D of the Final ER) was carried out to assess impacts on the Domtar Dam headpond located downstream. Special operating restrictions were developed to mitigate potential operational impacts on Domtar Dam. Specifically, Xeneca has committed to not alter flow in a manner that would cause the headpond of Domtar Dam to move outside of its compliance Operating Band (see Annex I for the Evaluation of Flow Fluctuations at Domtar Dam due to Wabageshik Rapid GS Operations, Xeneca Power Development, March 12, 2013).

- A statistical analysis was carried out in accordance with a scientific methodology provided by MNR to determine if the residual flow alteration related to the proposed operation of the Wabageshik Rapids GS is statistically significant compared to the flow alterations under existing conditions downstream of Domtar Dam. The results show that the alteration related to the proposed Wabageshik Rapids GS project is less than the existing condition downstream of Domtar Dam.

- Consideration was given to concern from both MOE and MNR about the potential for cumulative effects downstream of Domtar Dam, whereby a flow alteration resulting from the operation of the Wabageshik Rapids GS could be additive to the flow alteration occurring under existing conditions at Domtar Dam. It was determined that flow alterations at Domtar Dam are limited by the physical limitations of the facility. As a

result, the maximum flow alteration occurring at Domtar Dam is the same under existing conditions and under the assumption of cumulative effects of the proposed project.

- Consideration was given to an agency concern that a cumulative effect might occur when Domtar Dam operates at less than the maximum flow alteration. It was determined that it is possible that on certain days a flow alteration could occur downstream of Domtar Dam that would be larger than under existing conditions. Such an increased alteration would be dependent on operating decisions made by Domtar Dam and beyond the control of the proposed Wabageshik Rapids GS project. Within the definition of ZOI, this scenario is not consistent with the definition of "directly affected". It was further determined that even if such an operating decision were to occur at Domtar Dam, it would not be significantly different from existing condition and always within the maximum alteration occurring under existing conditions.

- Consideration was given to an agency concern that under certain low flow conditions, a shortfall of available flow might result, thereby forcing a compliance problem for the dilution of wastewater effluent downstream of the Domtar Dam. Xeneca agreed to special operating conditions for such flows, or alternatively, to enter into an operating agreement with Domtar such that a shortfall of available flow would not occur at any time. These commitments are reflected in the Operating Plan.

For the purposes of the EA process and public consultation, Xeneca defined the DZOI to include the 5 km river reach downstream of the proposed Wabageshik Rapids GS project ending with the confluence with the Spanish River. This location is within the headpond of Domtar Dam and includes Graveyard Rapids. Operating Plans, mapping and surveys, bathymetry, hydraulic, hydrology, thermal, sedimentation/erosion, water quality and aquatic and terrestrial biological studies as well as comprehensive hydraulic models and the Environmental Report itself were prepared to inform the various discussions with regulatory agencies, the public and aboriginal communities. Studies clearly show that the proposed operation will not directly affect flows and levels beyond this DZOI. Xeneca believes this approach to the definition of the DZOI to be consistent with the Class EA definition of the ZOI and respectful of potentially affected stakeholders.

River Use and Property Owners Within ZOI:

Extensive consultation has occurred with those engaged in activities within the ZOI and property owners within the ZOI (detailed in Appendix D of this ER). Two commercial facilities are potentially affected: the Lorne Falls generating station at the upstream end of Wabagishik Lake and the Domtar Dam facility downstream of the proposed project. Extensive consultation has occurred with the owners of both facilities and bilateral negotiation has occurred on avoidance of potential negative impacts and indemnification of any unexpected effects. Xeneca has

committed to agencies to make best efforts to seek a signed agreement prior to issuance of permits, or, alternatively, to take self-imposed additional operating constraints as outlined in the Operating Plan. To date, Vale has indicated agreement with a letter of intent. A Domtar mitigation letter is currently in draft form, and is in process pending the results of a third-party review of the operating plan.

Several private property owners exist along the shoreline of Wabagishik Lake. Extensive consultation has occurred to ensure that owners understand the proposed operation (i.e. maintaining normal lake levels but with a possible ± 5 centimetre operating band). Xeneca is not aware of any unresolved concerns by upstream property owners regarding the proposed operation.

Private property exists adjacent to the DZOI. One of the properties includes a permanent residence and two others are seasonal recreational properties. Extensive consultation has occurred with these land owners. The representatives of one of the properties has repeatedly expressed opposition to the project, including concerns about low water levels, construction noise and the visual impact of having to see the dam. The latter two issues were addressed by moving the dam location 255 metres upstream from its original location. The concerns on water levels were addressed by committing to maintain minimum water levels downstream as well as by constraining the change in daily levels due to operation (see the Operating Plan in Annex I of this ER). Hydraulic modeling was carried out to verify that the proposed commitments are technically achievable (Annex I). The proposed operating constraints are well within the normal range of levels experienced under existing conditions. As such, legal riparian issues do not exist regarding the proposed water levels.

Rationale Beyond DZOI:

Considered were the potential alterations to flows and levels downstream of the DZOI (i.e. beyond 5 km downstream of the proposed project) to the upstream side of Domtar Dam. As outlined in the background section above, this location represents the confluence with the Spanish River and lies in the existing headpond of Domtar Dam. Although the hydraulic models show that small alteration to water levels could occur in Domtar Dam due to the operation of the proposed project, it was determined that this impact is not material for the following reasons:

- Existing conditions downstream of Domtar Dam were assessed. It was determined that the existing condition downstream of Domtar Dam involves daily variability in flows and levels due to the existing operation of Domtar Dam.
- The headpond of Domtar Dam is operated within a compliance-based Operating Band. Xeneca has committed to return to run-of-river operation if, at any point, the operating

band of the Domtar dam is exceeded. This will ensure that there will never be a situation where water levels are outside of the existing condition. Xeneca believes that this mitigation fully addresses the definition of ZOI.

- Aspects other than flow alteration were considered that could potentially impact beyond the DZOI. Water temperature, water quality and sediment were examined. None of these aspects suggested a significant effect within the DZOI, therefore it was concluded that they would not impact the river beyond the DZOI. Please see Annex I for reference.
- The commitment by Xeneca to further constrain operations to 6.5 m^3/s if an agreement is not reached with Domtar further assures that this commitment will be met.

Consideration was also given to the agency concern on possible impacts beyond Domtar Dam as noted in the "Background on Downstream ZOI" section above. Although this part of the river may not be directly affected by flow alterations made by Xeneca's Wabageshik Rapids GS, the significance of any indirect flow alterations were considered. Specifically the following aspects were contemplated:

- Any potential indirect effect on effluent dilution downstream of Domtar Dam has been adequately addressed with operating restrictions and commitments made in the ER.
- No impact on riparian or adjacent property can occur downstream of Domtar Dam as any cumulative alterations in flow are within the range of existing conditions.
- No indirect aquatic impact can occur as any cumulative alterations in flow are within the range of existing conditions.

Without an alteration outside of existing conditions outside of the ZOI, it was concluded that there is no impact on MNR mandates (i.e. users, property owners, land use, aquatic/terrestrial habitat and recreational/commercial activities) and that no further habitat studies or consultations are required beyond the proposed ZOI. Prior to issuance of permits, MNR will be able to review the commitments to ensure that their mandate has been satisfied as proposed in the ER.

Effects Assessment Within ZOI:

Detailed assessments were carried out within the ZOI to establish existing baseline conditions. A comprehensive assessment was carried out considering the proposed impacts of the project footprint, construction and operation on the existing conditions. A detailed effects and mitigation analysis is contained in this ER.

437697 836900 442697 836900 447697 836900 452697 836900 457697 836900

5129316 5126816 5124316 5121816 5119316 5116816

Lorne Falls Plant

Wabageshik Lake
within Zone of Influence

Headpond

Spanish River

Downstream Zone Influence

Snowmobile Bridge

Vermillion River

Wabageshik Project Dam Location

Option 2

Option 1

Espanola

Wabageshik Dam and Construction Areas

Reference data from the LIO, MNR, NRCan - UTM 17N LIO. Produced by: N Collard (revision 1) 2013 Jul 16

Figure 1: Wabageshik Site Location and Zone of Influence

- Portage
- Snowmobile Trail
- Existing Roads
- New Access Road
- Temporary Access Roads
- Proposed Powerline
- Laydown Area
- Substation
- Waterbodies
- Downstream Zone of Influence
- Headpond
- Wabageshik Lake

ORTECH Power

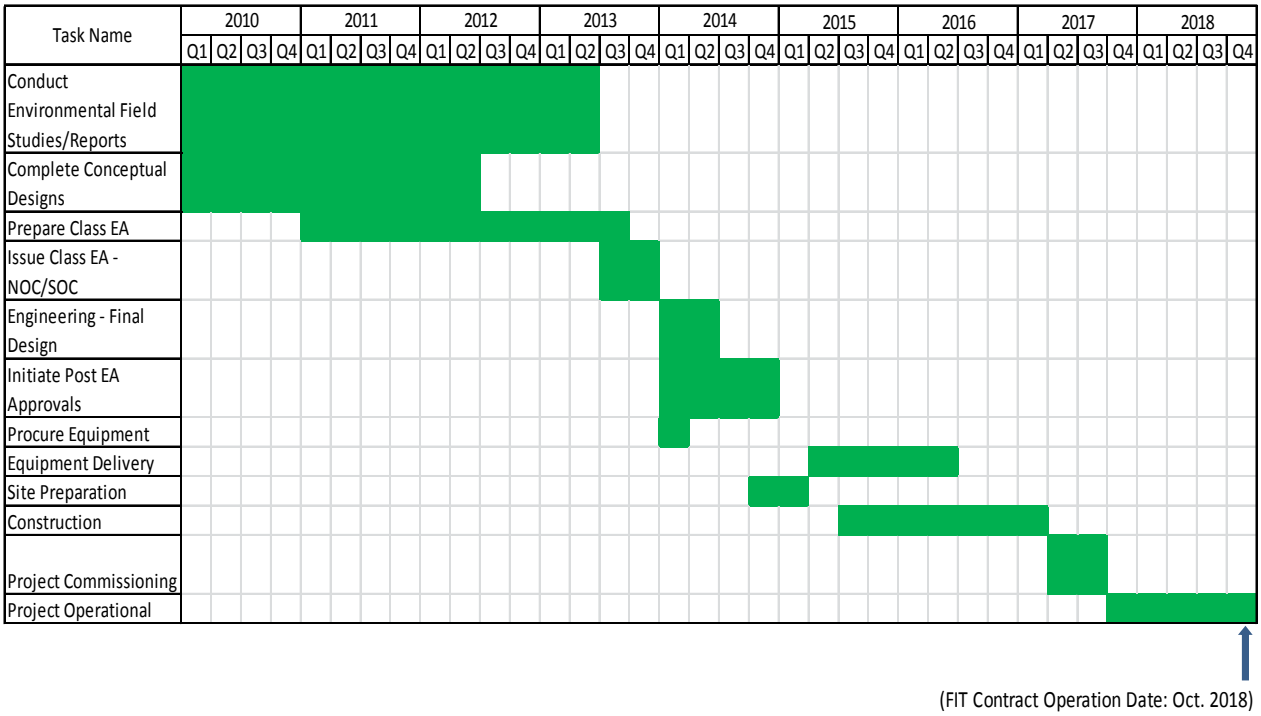
N W E S

0 1 2 4 Kilometers

1.2.2. Tentative Project Development Schedule

A tentative project development schedule outlining key project phases which have been or will be completed is provided below in Figure 2. As noted in Section 1.2, a 3-year extension to the existing FIT contract is anticipated, placing the Contract Operation Date from October 2015 to approximately October 2018.

Figure 2: Project Development Schedule



1.3. Overview of the Environmental Screening Process

The purpose of an EA is to recognize the potential effects of a project life cycle early in the project planning phase and take these effects into account during the development and design of the project. Environmental effects include both the positive and negative effects that a project would have, or could potentially have, on the environment at any stage in the project life cycle. The assessment also considers the effects of the environment on the project. The environment is defined as a combination of natural/physical, socio-economic, and cultural/human factors.

The planning process under the Class Environmental Assessment for Waterpower Projects (revised April, 2012) developed by the Ontario Waterpower Association (OWA) allows a proponent to assess the potential effects to the environment using the best information available in order to make an informed decision about whether a project should proceed to implementation. The

proponent is required to identify potential effects from the proposed undertaking and propose mitigation on the proposed effects. The proponent is also required to consult with regulatory agencies, the public and Aboriginal communities on the potential effects and seek resolution to issues that are raised during the EA process. This process is frequently referred to as the Waterpower Class EA. This ER meets the requirements outlined in the Waterpower Class EA.

The components of hydroelectric projects evaluated by the Waterpower Class EA can include reservoirs or headponds, water control structures, water conveyance structures (canals or penstocks), powerhouses, and access routes. Connection lines rated less than 115 kV and transformer stations rated less than 115 kV are also components of the overall project, but the assessment of these components is not required under the Waterpower Class EA; any information related to the connection line presented in this report is provided for the information of the reader.

For each of the project components, there are direct activities associated with their construction, operation and maintenance; e.g. removal of vegetation in the project footprint and the initial filling of the headpond. There are also indirect activities related to the maintenance and operation of these facilities, including small volumes of non-hazardous waste generation and their disposal, and a backup generating system powered by fuel.

The process of conducting this EA entailed the examination and evaluation of each component of the proposed development and their potential effect on each aspect of the current environment. Environmental effects may include, but are not limited to, alteration/loss/gain of natural features, flora or fauna and their habitat, ecological functions, natural resources, air and water quality, and cultural or heritage resources. Environmental effects may also include the displacement, impairment, or interference with existing land uses, land use and resource management plans, businesses or economic enterprises, recreational uses or activities, cultural pursuits, and social conditions and economic attributes.

1.3.1. Addendum Provisions for Environmental Reports

Should changes be proposed to the Wabageshik Rapids GS from what is presented in this ER, Xeneca must determine if the addendum provisions outlined in Section 8.8 of the Class EA for Waterpower Projects (April 2012) apply to the project change. Similarly, these addendum provisions must be applied if, following the construction/implementation of the project as described in this ER, Xeneca wishes to make a minor modification to the Wabageshik Rapids GS project (i.e. a modification that is below the threshold for a significant modification under the Electricity Projects Regulation. A significant modification is any expansion of or change in the facility that would increase the name plate capacity of the facility by 25 percent or more).

The addendum provisions of the Class EA for Waterpower Projects would require the proponent to determine whether the proposed change(s) may result in new negative effects to the environment. In such a scenario, an Addendum to the ER must be prepared, outlining the proposed changes, the rationale for proposing and the implications of these changes, and a review of the mitigation measures that will be applied to minimize these effects. As with the ER presented herein, an Addendum to the ER would be subject to a minimum 30-day review period with the opportunity to request a Part II Order.

1.4. Approach to the Environmental Screening Process

The EA team included internal departments within Xeneca (i.e. personnel from the Corporate Affairs and Communications (including Public Affairs and Aboriginal Relations), Environmental Affairs, Engineering, and Legal Affairs departments) as well as technical consultant firms retained by Xeneca for the proposed undertaking as such:

- Canadian Projects Limited (Ltd.)
- Hatch
- Howe Gastmeier Chapnik Ltd.
- Hutchinson Environmental Sciences Ltd.
- KBM Resources Group
- Natural Resource Solutions Inc. (NRSI)
- Northern Bioscience
- OEL-HydroSys and WESA, divisions of BluMetric Environmental Inc.
- Ontario Resource Management Group Inc.
- ORTECH Consulting Inc.
- Parish Geomorphic Ltd.
- Woodland Heritage Services (WHS)

1.4.1. Legal Framework

As a waterpower development with an installed capacity less than 200 MW, this project is subject to the Waterpower Class EA planning process developed by the Ontario Waterpower Association (OWA) as approved by the Ontario Ministry of the Environment (MOE) in October 2008 (revised in April 2012) under the Ontario *Environmental Assessment Act (EAA)*. The Vermilion River has existing water control infrastructure in place in other sections of the waterway and the river is currently managed for water levels and flows. The proponent has categorized the proposed waterpower facility at Wabageshik Rapids as a 'new project on a managed waterway' as per the definitions in the Waterpower Class EA (see Appendix A of this report).

The EA team also reviewed other applicable environmental assessment guidelines and legislation regulating small hydroelectric developments in the Province of Ontario, and determined that the following regulatory processes and guidelines may be applicable to this undertaking:

- Federal Requirements for Waterpower Development Environmental Assessment Processes in Ontario – Practitioner's Guide (DFO-OWA, 2010); and
- The Water Management Planning Guidelines for Waterpower, Ontario (MNR, May 2002).

The proposed project will also require an authorization from Fisheries and Oceans Canada (DFO) under the *Fisheries Act* and an approval from Transport Canada under the *Navigable Waters Protection Act* (NWPA). In the early stages of the planning process (2007), these federal regulatory approvals triggered the requirement for a screening-level environmental assessment under the previous *Canadian Environmental Assessment Act* (*CEAA*). However, since the enactment of the new *CEAA 2012*, a federal screening is no longer required. As such, this ER document is primarily intended to meet the Waterpower Class EA requirements, though federal regulatory information requirements have been addressed where possible.

Based on a preliminary review of the project, the MNR indicated that the assessment of the connection line to be constructed as part of the project would also be subject to review under the Class Environmental Assessment for MNR Resource Stewardship and Facility Development Projects (RSFDP), MNR. Subsequent amendments were made to Ontario Regulation 334 under the *EAA* (s. 15.0.1) that exempt any undertakings by or on behalf of the Crown that are being carried out only for the purposes of implementing a renewable energy project. Waterpower projects are subject to the requirements of the *EAA* under Ontario Reg. 116/01, with the Waterpower Class EA as the primary planning process. The proposed connection line for the Wabageshik Rapids GS falls into a 'Category A' undertaking as per O. Reg. 116/01 and is therefore exempt from an *EAA* requirement. As the Ministry responsible for managing most Crown resources, through disposition, approval and permits under a number of statutes, MNR has indicated that it still requires information to support decisions related to the disposition, approvals or permits required for transmission line projects. Xeneca has included preliminary information on the connection line route in this document and in public information centres towards satisfying future permitting consultation requirements.

1.4.2. Characterize Local Environment of Proposed Development

The EA team collaborated in the completion of a Potential Effects Identification Matrix. This matrix was included in the Project Description document (see Appendix B) developed by Xeneca, and circulated to regulators in order to begin the planning process. The EA team worked with

many stakeholders at the local, provincial and federal levels to ensure that the local environment including physical, social/cultural and economic aspects were well understood.

The EA team completed the following tasks to characterize the local environment in the proposed development areas:

- A detailed literature review of existing information available through provincial and federal databases. The documents are identified in the References section (Section 16) in this document and in the technical reports referenced throughout this document.
- Engineering field investigations to supplement the topography, water depth and hydrology data. A statistical analysis of historical hydrological data was completed. Hydraulic modeling was also undertaken to assess flow depths and velocities. Steady-state and unsteady-state hydraulic models were developed using HEC-RAS. This information can be found in Annexes I and II. Field investigations to supplement the terrestrial and aquatic biology record available for the site and background surface water quality. The EA team undertook detailed field investigations throughout the project area to document existing conditions and assess the potential effects of the project on these conditions. The results of these studies are presented throughout this document. The results of these studies are presented throughout this document and in detailed reports in Annexes III and IV.
- Stage 1 and Stage 2 Archaeological Assessments to supplement the available historical record for the site. The results of these studies are presented throughout this document and in a detailed report in Annex V.A leaf-off aerial photography program was undertaken for all distribution line routes (20 centimetre (cm) resolution) utilizing digital true colour RGB ortho-photography. This was later augmented by a ground-truthing exercise for route segments running along existing roads. Each of the forest management companies that held Sustainable Forest Licenses (SFL's) were consulted regarding the project sites and additional information was obtained from the licensees. A summary report on the proposed transmission lines and roads can be found in Annex VI.
- A geomorphic assessment to characterize existing channel form and processes, including sediment dynamics, in the Vermilion River in and around the project site. The potential impacts of the proposed project on sediment dynamics and slope stability were assessed. The geomorphic assessment report can be found in Annex I.

1.4.3. Identify Potential Environmental Effects

The EA team used a consultative approach to identify the potential effects of the project in the early stages of the planning process through the completion of the Potential Effects Identification Matrix from the Class EA for Waterpower Projects (see Appendix B of this report). The matrix is

useful in determining the data gathering and analysis program, and it was circulated to the regulators at the beginning of the environmental assessment planning process.

In examining the potential effects of this project, the EA team considered the construction and operation/maintenance phases of the project, and their potential impacts within the determined ZOI. It should be noted that the project is expected to last for more than 75 years, and the legislative requirements for decommissioning may evolve substantially over that time period. Additionally, a proper assessment of the impacts of decommissioning the Wabagishik Rapids GS requires a solid understanding of baseline conditions, which in this case, are the characteristics of the biophysical and socio-economic environment prior to the start of any proposed decommissioning activities. Knowing that the biophysical and socio-economic environment may evolve substantially over a period of 75+ years, any assessment of decommissioning impacts, if conducted at this early stage of project development, would be speculative at best. As such, decommissioning activities are not assessed as part of this EA; the planning and approval of decommissioning will be addressed through the applicable legislation in place at that time (planning and other applicable regulations).

1.4.4. Identify Required Mitigation, Monitoring or Additional Investigations

Based on their areas of expertise, the EA team developed a summary of recommended actions to prevent or mitigate negative effects of the proposed undertaking on the environment. These mitigation measures were compiled based on the information collected during the study period (field and desktop), through consultation with government agencies, the information collected through the public consultation initiative, and Aboriginal engagement efforts. The residual effects (i.e. those that cannot be prevented, avoided or fully mitigated) are classified based on their significance. It should be noted that residual effects also include the positive benefits that would be achieved through the lifecycle of this project to ensure that all potential effects are afforded consideration.

Recommendations for environmental monitoring, where on-going data collection will be required to monitor short-term or long-term effects (i.e. those that would be experienced during construction and those that may be experienced subsequent to commissioning) have are included within this document. Environmental monitoring, if required, during both construction and operation will be subject to regulatory approval at the permitting stage in advance of construction.

The proponent has offered formal commitments related to the undertaking which may be required in advance of permitting, including additional data collection. A list of commitments proposed by Xeneca in support of the Wabageshik Rapids waterpower development is presented in Section 14, and throughout the main document and annexes.

1.4.5. Agency and Public Consultation and Aboriginal Communities Engagement

The consultation and engagement initiatives were designed to co-ordinate all applicable requirements for the regulatory, public and Aboriginal community notification, engagement and consultation. The results of these initiatives are presented within this document. The regulatory agencies, public interest groups and communities, First Nations, other Aboriginal groups and additional stakeholders identified during the EA planning process for the Wabageshik Rapids project include:

Canadian Environmental Assessment Agency (CEA Agency)
Aboriginal Affairs and Northern Development Canada (AANDC) (*formerly Indian and Northern Affairs Canada*)
Fisheries and Oceans Canada (DFO)
Transport Canada (TC)
Environment Canada (EC)
Natural Resources Canada (NRCan)
Health Canada (HC)

Ontario Ministry of Aboriginal Affairs
Ontario Ministry of the Environment (MOE)
Ontario Ministry of Energy (ME)
Ontario Ministry of Municipal Affairs and Housing
Ontario Ministry of Natural Resources (MNR)
Ontario Ministry of Northern Development and Mines (MNDM)
Ontario Ministry of Tourism, Culture and Sport (MTCS)
Ontario Ministry of Transportation (MTO)

Sagamok Anishnawbek First Nation (SA)
Whitefish River First Nation (WRFN)
Whitefish Lake First Nation (WLFN)
North Chanel Métis Council
Sudbury Métis Council
Wikwemikong Unceded Indian Reserve
Aundeck Omni Kaning First Nation
M'Chigeeng First Nation
Serpent River First Nation
Sheguiandah First Nation
Wahnapitae First Nation
United Chiefs and Councils of Mnidoo Mnising (UCCM)

Township of Lively
Township of Nairn and Hyman
Township of Sables-Spanish Rivers
City of Greater Sudbury
Town of Walden
Town of Onaping Falls
Town of Espanola

Cambrian College
College Boreal
Domtar
Ducks Unlimited Sudbury
Earthcare Sudbury
Environmental Committee Paddle Canada
Espanola and District Snowmobile Club
Espanola Game and Fish Protective Association
Friends of the Spanish River
Greater Sudbury Chamber of Commerce
Laurentian University
Nickel District Conservation Authority
Northern Ontario Tourism Outfitters

Northshore Forest LCC
Northwatch
Ontario Recreational Canoeing & Kayaking Association
Ontario Federation of Anglers and Hunters
Ontario Federation of Snowmobile Clubs
Ontario Rivers Alliance
Silver Maple Campground
Sudbury Revolver Club
Sudbury Canoe Club
Sudbury Game and Fish Protective Association
Sudbury Trail Plan Association
Spanish-Vermilion River WMP Public Advisory Committee
Sudbury Forest LCC
Rainbow Country Snowmobile Association
Trailsmen Rod & Gun Club
Vale Limited

Vermilion Forest Management Inc.
Vermilion River Campground
Vermilion River Stewardship
Vermilion Stakeholder Advisory Committee
Walden-Can
Whitewater Ontario
Xstrata Nickel
Interested members of the general public

A summary of the key consultation activities is provided below:

- A Notice of Commencement (NOC) and a subsequent revision to the NOC were issued by Xeneca and advertised in local media. The first NOC was issued on July 28, 2010. The NOC was subsequently revised to include a list of applicable legislation to which the project would need to adhere (*Fisheries Act*, *Lakes and Rivers Improvement Act*, *Environmental Protection Act*, etc.) as well as an explanation of requirements under the *Freedom of Information and Protection of Privacy Act* with regards to the submission of personal information during the EA process. The revised NOC was issued on November 4, 2010. Both versions of the NOC are included in Appendix D of this ER.
- A Project Description for the hydroelectric generating station was issued on November 19, 2010 to provincial ministries, municipal stakeholders, the OWA and circulated federally through the Federal Environmental Assessment Coordinator (FEAC). An EA Coordination planning meeting was held on February 8, 2011, and was attended by federal and provincial regulators. Agency consultation records and a summary of the regulatory consultation are presented herein (Appendix D).
- Three Public Information Centres (PICs) were held at the Espanola Recreation Complex in Espanola, Ontario (on March 22, 2011, October 20, 2011, and July 25, 2012). The public consultation log and details of the public consultation events held in support of this undertaking are provided herein (Appendix D).
- The Project Description was distributed in late 2010 and early 2011 to the WLFN, the SAFN, Wikwemikong Unceded Indian Reserve and WRFN. The Métis Nation of Ontario was also provided with a copy of the Project Description in May 2011. A record of Aboriginal engagement and consultation in support of this undertaking is provided herein (Appendix C).
- Advertisements, mandatory notifications, and correspondences for the Wabageshik Rapids project are discussed further in this report and copies are provided (Appendix C and D).
- While there is no formal requirement for a review of the Draft ER in the Waterpower Class EA, a Draft ER was circulated to key agencies in order to facilitate an efficient regulatory review of the final document. The Draft ER was distributed to DFO, EC, MOE and MNR on August 10, 2012. Review comments were received from each of the four

ministries/departments. Xeneca issued responses to the review comments and revised the ER accordingly. Consultation with Agencies, including these question and answers are presented in Appendix C.

- The Final ER will be provided to regulatory agencies, First Nations, Aboriginal groups and made available for electronic review to stakeholders that were identified during the EA planning process. As per the Class EA for Waterpower Projects, the Final ER will be available for a 33-day formal review period, from September 30, 2013 to November 1, 2013. Electronic copies will be available for download at www.xeneca.ca. Hard copies of the ER will be available for public viewing at the following locations:

    - The Corporation of the Township of Nairn & Hyman – Municipal Office
    - Espanola Public Library
    - Espanola Town Hall
    - Sudbury City Hall
    - Township of Sables-Spanish Rivers

- A Notice of Completion was issued for publication in local media (the Sudbury Star and the Espanola Mid-North Monitor) on September 26, 2013, emailed to stakeholders and posted on the Xeneca website.
- Formal review of the Final Environmental Report and submission of reviewer comments (both regulatory and public) identifying outstanding issues and any requests to meet with Xeneca.
- During the formal review period, Xeneca and the stakeholders will attempt to resolve any outstanding issues. If, at the end of the formal review period, the stakeholder is not satisfied with Xeneca's proposed resolution, the stakeholder may make a written request to MOE for a Part II Order. Such requests are to be compliant with requirements of the Waterpower Class EA.
- Once the proponent has met the requirements of the Waterpower Class EA and has resolved any outstanding issues raised during the formal review period, and satisfactorily addressed any Part II Order requirements (if filed), the proponent may file a Statement of Completion.

2. EXISTING CONDITIONS

This section provides a description of the existing environmental conditions in the proposed project area.

2.1. LOCATION AND LAND OWNERSHIP IN PROJECT AREA

The proposed project is to be located at Wabageshik Rapids (from which the proposed GS derives its name) on the Vermilion River within the Township of Foster, approximately 50 km southwest of the City of Sudbury, 11 km east of Espanola, and 6 km south of the Trans-Canada Highway (17). The river feature known as 'Wabageshik Rapids' is located downstream of the outlet of Wabagishik Lake, and spans a length of approximately 1.2 km. The proposed site for the GS falls within the downstream portion of Wabageshik Rapids, at a point approximately 800 metres (m) downstream from the outlet of Wabagishik Lake; a site location map is provided as Figure 1. The area of inundation upstream of the proposed dam structure impact both provincial Crown Land and private land. Riparian areas downstream affected by the operating strategy of the facility involved only land below the average high water level and therefore affect only Provincial Crown land. The locations of backshore private property along the banks of the Vermilion River downstream of the proposed project site are shown on the features maps included in Annex I. The proponent has considered, within the planning process, if the access rights of these landowners has been affected as a result of the project. The project infrastructure footprint (i.e. the civil works of the generating station, control structure, access road(s) and connection line) are located entirely on provincial lands. Conceptual design details are found in Annex II.

The approximate geographic coordinates for the site are (latitude, longitude): 46°16'8.94"; -81°37'27.19". The Vermilion River drains an area of 4,393 kilometres squared (km^2) at the proposed site.

2.2. EXISTING INFRASTRUCTURE

2.2.1. Water Control Structures and Water Management Plan

The Vermilion River watershed contains a number of water control structures; the Lorne Falls Dam and GS (also known as the Wabagishik Dam/GS) is located on the Vermilion River, just upstream of Wabagishik Lake, approximately 10 km upstream from Wabageshik Rapids. The dam is owned and operated by Vale. The Lorne Falls facility is operated as a run-of-river system. Discussions between the proponent and Vale are ongoing.

The Spanish River has been a managed watershed for over a century. The Nairn Dam (operated by Vale) is located on the Spanish River, approximately 15 km upstream of the confluence of the

Spanish and Vermilion systems. Another dam, operated by Domtar, is located in Espanola on the Spanish River downstream of the confluence with the Vermilion River, approximately 12 km from Wabageshik Rapids.

The Spanish/Vermilion Rivers Water Management Plan (SVRWMP) is presently undergoing the Draft review stage. An amendment to the SVRWMP would be required for the inclusion of Wabageshik Rapids GS. Water management planning is governed by the *Lakes and Rivers Improvement Act* (*LRIA*) which is administered by the MNR. Under the *LRIA*, facility operators are required to comply with the approved operating regimes (required levels and flows).

2.2.2. Roads and Power Lines

Highway 17 follows an east-west route in proximity to the project area. The junction of Highway 17 and Highway 6 is located approximately 60 km west of Sudbury. This highway follows a north-south route through the Town of Espanola, approximately 10 km west of Wabageshik Rapids project. Highway 17, as part of the Trans-Canada highway, is the primary traffic route through this part of Northern Ontario (see also Tile G4 in Annex VI of this ER for a map of the road network around Espanola).

As presented in Tile G3 (Annex VI), there are presently no public access roads leading directly to the site. The closest access road is called Panache Lake Road which runs east from Espanola. This road is classified as a primary road with current maintenance responsibility falling under the Town of Espanola and the local Foster Truman Roads Board (Power Line and Road Summary in Annex VI of this ER). New access roads will be built from the site to Panache Lake Road.

An existing 7 km gravel private access road leads from Highway 6 to the area downstream of the rapids. This road has been maintained by local landowners for several years. Xeneca does not plan to use this road to access the site.

An existing transmission line (Feeder 18M2) runs west of the site location, near Espanola, owned by Ontario Power Generation (OPG).

2.3. TOPOGRAPHY

The general topography of the area is characterized as relatively flat uplands and lowland areas with bedrock outcroppings (Rowe 1972). The proposed dam site is situated across a cobble narrow bedrock valley opening up to a wide vegetated section of the Vermilion River.

2.4. CLIMATE

Information provided on the Corporation of the Town of Espanola's website (www.town.espanola.on.ca) reports that Espanola derives its climatic data from Environment Canada's Sudbury A station. For the Town of Espanola, mean daily temperatures range from a high of 19 degrees Celsius (°C) in July to a low of -13.6°C in January. Mean maximum daily temperatures reach a peak in July of 24.8°C, with 38.3°C being the highest daily temperature on record. The lowest mean minimum daily temperatures are reached in January (-18.6°C) with -39.3°C being the coldest day on record. Annual precipitation averages 931 millimetres (mm) with rainfall accounting for 656.5 mm of that total. On average, September is the wettest month and February is the driest.

2.5. SOILS

Soils are thin and wildly undulating bedrock is primarily encountered. In the low 'valleys' between the bedrock highs one encounters wetland areas filled with mineral soils washed from the surrounding bedrock during post glacial times (see the Stage 1 Archaeological Impact Assessment in Annex V). Site specific soil information may be available following site investigations to be undertaken in the pre-construction phase of the project development following the successful completion of this EA.

2.6. GEOLOGY

The project study area is located in the Superior Province of the Canadian Shield. Along the north shore of the Vermilion River at Wabageshik Rapids the bedrock consists of amphibolites and metamorphosed gabbro belonging to the Nipissing diabase. Bedrock on the south shore of the river is formed by sandstone and siltstone of the Mississagi Formation. Conglomerate belonging to the Bruce Formation is also found in the study area, approximately 200 m south of the rapids. The Elizabeth Lake Fault extends from south-southwest to north-northeast approximately 100 m west of the rapids. Details about the timing and extent of movement along the fault are not available; however given the geological stability of the Canadian Shield, the fault is in all likelihood an inactive one. There is insufficient information on the surficial geology immediately surrounding the study area (approximately 1 km radius). 1-3 km downstream of the project site are intermittent areas of organic peat and muck overlying sandy, silty glaciolacutrine plain. These areas have low local relief and wet drainage.

2.7. HYDROGEOLOGY

A review of Ontario Ministry of the Environment's electronic well records database revealed there are no reported water well records within a 1-km radius of the project site. Information on

groundwater in the area of the project may be provided in records of any geotechnical holes to be drilled around the site.

2.8. RIVER HYDROLOGY

The following information was sourced from available background data and data collected during field investigations.

The Vermilion River is the main tributary to the Spanish River, its headwaters originate in Frechette Township. The river has an approximate length of 248 km, and follows a winding southerly direction.

The proposed project site is located at the downstream end of Wabageshik Rapids on the Vermilion River. The Vermilion River originates northeast of Vermilion Lake and flows through numerous large lakes (Vermilion Lake, McCharles Lake, Rat Lake, Grassy Lake, Wabagishik Lake), and includes tributaries, islands, marshes, swamps, and meandering channels with wooded shorelines. Wabagishik Lake is approximately 10 km in length. The inlet of the Vermilion River is located on the northeast side of Wabagishik Lake; the outlet of the lake is located along the southwest end. The project site is located approximately 800 m downstream of the outlet of Wabagishik Lake.

Approximately 400 m downstream of Wabageshik Rapids, the Vermilion River widens into an embayment area. In addition to the Vermilion River itself, this embayment area is fed by two small tributaries.

The Vermilion River continues to flow in a westerly direction until it outlets into the Spanish River, approximately 5 km downstream of the project site. Throughout this 5 km section of river downstream of the proposed dam site, the general geomorphology of the channel varies from boulder rapids, lakes/pools, and runs (see the Geomorphic Assessment report, March 2013, in Annex I of this ER).

The reader is referred to Figure 1 provided in the 2009 Hydrology Review for the Vermilion River Hydro Development Sites (Hatch, 2009) appended in Annex I for a map detailing the Wabageshik Rapids watershed.

2.8.1. Water Levels, Flow and Movement

Flow values for the Vermilion River at Wabageshik Rapids were prorated using drainage basin area, from Water Survey of Canada gauge 02CF004 (Vermilion River at Lorne Falls, 1954-1993). Hydrographs and flow duration curves have been developed for this site and are provided in Annex I.

The development and operation of the proposed generating station would alter the existing river system and the hydrological characteristics of the Vermilion River both upstream and downstream of Wabageshik Rapids. The proponent is therefore required to determine the flows required to maintain aquatic ecosystem integrity in the project's zone of influence. This was accomplished using a combination of field investigation, desktop study, computer modeling and agency consultation (see Annex I).

2.8.2. Surface Water Quality

The surface water quality on the Spanish River (to which the Vermilion River discharges) has been impacted by historical and current development projects. According to a September 2010 Environment Canada and Ontario Ministry of the Environment publication:

> "Environmental concerns in the Spanish Harbour Area in Recovery were linked to the impacts from the Espanola sewage treatment plant, past log-driving operations, effluent from the pulp and paper mill in Espanola (Domtar Inc. Eddy Specialty Papers; formerly E.B. Eddy Forest Products Ltd.), and discharges from past and ongoing mining, milling and smelting activities in the Sudbury area. The Vermilion River, which enters the Spanish River above Espanola, drains the Sudbury basin and carries contaminants from these and other sources into the Area in Recovery."(EC and MOE, 2010)

In order to distinguish between impacts on water quality that have resulted from historical development projects versus those that result from the proposed Wabageshik Rapids GS (if any), a surface water quality sampling program was developed by the EA project team (see Annex IV). The program was developed in accordance with the guidelines of the draft MOE document titled "From Class EA to Permit to Take Water: A Guide to Understanding the Ministry of the Environment's Technical Requirements for Waterpower" (January, 2012).

The following subsections summarize the water quality sampling that has occurred to date within the zone of influence of the proposed Wabageshik Rapids GS. The water quality results will serve as the baseline conditions against which the post-construction water quality samples will be compared.

<u>2010 Studies</u>

A preliminary surface water quality investigation was undertaken in 2010 to investigate ambient pre-development characteristics of the waterway. Two sampling events (spring and summer) were conducted in 2010 at two locations: SW1 (at the outlet of Wabagishik Lake) and SW3 (approximately 500 m downstream of the proposed Wabageshik Rapids GS, in the embayment area); the locations of the two sampling sites are also illustrated on a map in Annex III (Appendix I, Aquatics Assessments – Map 1). During the sampling events, general hydromorphological and

physical characteristics of each sampling location were assessed and recorded (i.e. water level, velocity, color and odour). The results were compared to the Provincial Water Quality Objectives (PWQO). The PWQOs were established by the MOE in 1994 (reprinted in 1999) and has a supervisory role of all surface water in Ontario to establish ambient water quality conditions in the vicinity of the proposed project location. The reader will note that several of the parameters subjected to analyses do not have a PWQO.

The spring event was undertaken on May 30, 2010, during which measured levels of nickel exceeded the PWQO in both SW1 and SW3. In the summer sampling event on August 4, 2010, copper and nickel exceeded the PWQO in both SW1 and SW3. A copy of 2010 surface water investigation letter report is provided in Annex IV.

2012 Studies

In 2012, sampling was conducted once during each of the three annual open water flow periods: during the waning flow of the spring freshet (April), during the summer low-flow period (August) and during the increasing fall flow (November) to collect represent water samples during each of the three seasonal open water flow regimes. The sampling was conducted according to the recommendations of the MOE document titled "From Class EA to Permit to Take Water: A Guide to Understanding the Ministry of the Environment's Technical Requirements for Waterpower" (Draft - January, 2012). Two years of water quality monitoring will be conducted according to the guidance with the final results presented in early 2014.

The pre-development water quality monitoring indicates that the Vermilion River in the project area has relatively good water quality, typical of a northern Canadian Precambrian Shield river with limited impacts from mining activities. Aluminum, copper and nickel concentrations exceeded PWQOs, possibly because of upstream mining activities and natural sources of these parameters in the watershed. The river has low total suspended solids, dissolved organic carbon and nutrient concentrations, with all parameter concentrations well below the PWQOs. The river's water quality is linked to its seasonal flows, indicated by increased suspended sediments and associated adsorbed metals and nutrients during high spring and fall flows. A list of all analytical parameters for the water quality investigation is provided in the September 2013 document found in Annex IV.

Water samples were also taken at the site of the proposed weir and downstream of the rapids in late November 2012, to measure for total suspended solids (TSS). The TSS concentrations at the site of the proposed weir and downstream were 3 milligrams per Litre (mg/L) and 4 mg/L, respectively (see the May 21, 2013 memo from Parish Geomorphic in Annex IV of this ER).

2.9. ECOLOGY

The EA team analyzed the existing ecological conditions at the project site based on the Site Information Package (included in Appendix A of this ER) received from the MNR and field investigations conducted in 2010, 2011 and 2013. General project area studies were conducted in 2010 and 2011, while studies specific to the lines and roads corridors were conducted in 2013.

Detailed fisheries, aquatic habitat, and terrestrial habitat and species investigations were completed to supplement available background information. The study area described in this section is based on the predicted ZOI, along with an additional 120 m buffer around the waterbodies within this ZOI. The ZOI encompasses the proposed new inundation (an 800 m length of the Vermilion River), Wabagishik Lake, and approximately 5 km of the river immediately downstream of the proposed Wabageshik Rapids GS (down to a point approximately 200 m upstream of the confluence between the Vermilion River and the Spanish River). The study area also includes a 500 m wide buffer surrounding both road options as they are described in Section 3.4.

The detailed findings of the field investigations are provided in Annex III of this ER. General project area results are summarized in the 2013 Natural Environment Characterization and Impact Assessment Report; results specific to lines and roads can be found in the documents titled, "Baseline Environmental Conditions for Road Options" and "Distribution Line and Access Road Targeted Survey Results" in Annex III. Key natural features, such as tributaries, wetlands and fast water zones, are identified on the downstream features identification maps included in Annex I. A brief summary of the findings is presented below for the reader's convenience.

2.9.1. Terrestrial Habitat and Species

Vegetation communities were identified to the ecosite level, using the Ecological Land Classification Field Manual (MNR, 2009) and associated Great Lakes St. Lawrence Factsheets (Wester et al., 2010). Seven ecosite types were identified within 120 m of the proposed development activities and the associated area of inundation. These ecosites represent seven different forest communities characteristic of the surrounding landscape. One wetland ecosite was also identified within the downstream extent of the proposed dam.

- G040Tt – Dry, Sandy: Aspen – Birch - Hardwood; located on the north side of the proposed dam and inundation area, southeast side of Vermilion River adjacent to Wabagishik Lake
- G023Tt – Very Shallow, Humid: Red Pine – White Pine Conifer; located on the north side of the proposed dam and inundation area, adjacent to the shoreline

- G069Tt – Moist, Coarse: Red Pine – White Pine: Mixedwood; located on the north side of the Vermilion River.
- G025Tt – Very Shallow, Humid: Hemlock – Cedar Conifer; adjacent to south side of Wabageshik Rapids
- G023Tt – Very Shallow, Humid: Red Pine – White Pine Conifer; south side of the river
- G067Tt – Moist, Coarse: Spruce – Fir Conifer; south side of the river
- G070Tt – Moist, Coarse: Aspen-Birch Hardwood; adjacent to the south side of proposed dam and inundation area
- G148N – Mineral Shallow Marsh; four tributaries within the downstream extent of the dam and inundation area

Additionally, the ecosites found within the area of forest removal for the road options (assuming a 15-m wide road corridor) include:

- G014 – Very Shallow, Dry to Fresh: Conifer (Option 1 only)
- G018 – Very Shallow, Dry to Fresh: Maple Hardwood
- G101 – Fresh, Silty to Fine Loamy: Spruce – Fir Conifer
- G104 – Fresh, Silty to Fine Loamy: Aspen – Birch Hardwood
- G107 – Fresh, Silty to Fine Loamy: Maple Hardwood
- G113 – Moist, Fine: White Pine Conifer (Option 2 only)
- G115 – Moist, Fine: Hemlock – Cedar Conifer (Option 1 only)
- G116 – Moist, Fine: Spruce – Fir Conifer (Option 2 only)

Soils along the existing trail and throughout the area are predominantly finer textured loams and clays. The terrain along this route is quite variable consisting of larger rock outcroppings transitioning into low lying wet areas. Most of the forest on both road options is 80 to 99 years old. There is an extensive area of younger forest (less than 40 years old) south of the Vermilion River. No forest is aged at greater than 100 years old, although individual trees and small clumps of trees with in the stand may exceed this age.

No significant vegetation species were identified within the zone of influence of the facility; however a forest stand with greater than 10% cover of white oak was identified between the existing snowmobile trail and the southwestern shore of Elizabeth Lake, during the lines and roads assessment work conducted in the spring of 2013. This forest stand is considered a rare vegetation community, and was associated with Rock Barren, an ecosite that is uncommon to rare in Ecoregion 5E. Stands containing white oak often produce significant mast for wildlife.

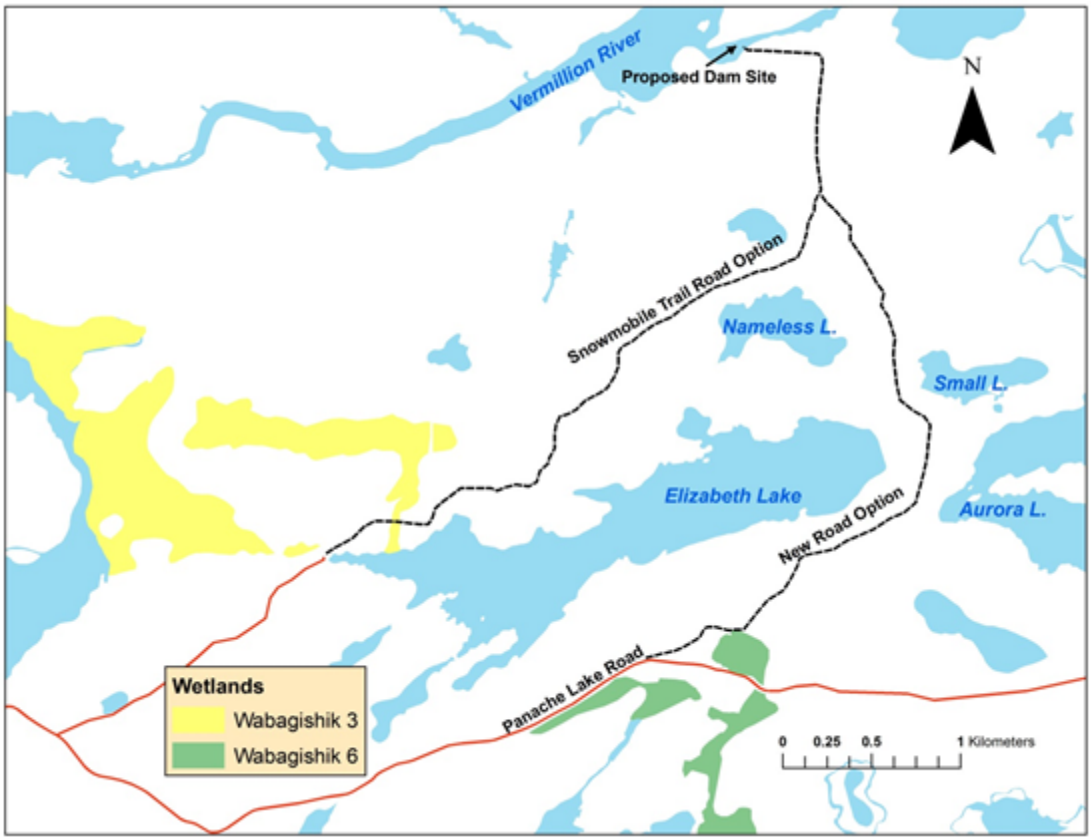
A total of 106 plant species were found during vegetation inventories in the general project area. A full list of plant species can be found in Annex III of this ER (NRSI Natural Environment Characterization and Impact Assessment Report, August 2013).

Wetlands

Downstream of the proposed dam site, a large bay with cobble and gravel shoals contains open water and an abundance of submergent and emergent aquatic vegetation in the backwater areas. Smaller wetlands are situated in pockets downstream of the bay, associated with tributary stream outlets.

A "rapid assessment" of wetlands within 500 m of the proposed roads and lines corridors was conducted in 2013. A predictive model developed by the MNR was then used to identify those that are likely to be provincially significant, according to the Northern Ontario Wetland Evaluation System (MNR, 1993). Based on the findings of the model, two wetlands within the proposed road corridor options are predicted to be provincially significant. "Wetland 3" extends from the west end of Elizabeth Lake to Brazil Lake and is transected by the existing Snowmobile Trail Road Option. "Wetland 6" lies towards the south end of the New Road Option and is transected by Panache Lake Road (see Figure 3).

Figure 3: Wetlands in the Vicinity of the Road Options that are predicted to be Provincially Significant



Birds

The open water pool downstream of Wabageshik Rapids is considered confirmed significant wildlife habitat for osprey foraging, and Wabagishik Lake is confirmed significant wildlife habitat for bald eagle foraging.

A total of ninety six (96) bird species have the potential to regularly occur and/or breed within the vicinity of the study area. A total of thirty-nine (39) bird species were observed during the breeding bird surveys in 2010; an additional ten (10) species were recorded during incidental observation. Of these, twenty-five (25) demonstrated possible breeding evidence, twelve (12) displayed probable breeding evidence, and two species (Spotted sandpiper (*Actitis macularia*) and Common grackle (*Quiscalus quiscula*)) demonstrated confirmed breeding evidence. Two bird species, the Ring-billed gull (*Larus delawarensis*) and Herring gull (*Larus argentatus*) were observed without any breeding evidence. Bald eagle and Osprey were also observed within the project area during field surveys in 2010-2011. While not provincially or federally designated, their nesting, foraging and perching habitat is considered Specialized Habitat for Wildlife. The open water pool downstream of the proposed Wabageshik Rapids GS is considered confirmed Significant Wildlife Habitat for Osprey foraging.

During surveys of the lines and roads corridors in 2013, a total of sixty-nine (69) species of birds were observed. Two forest-nesting bird species at risk were discovered in the study area (Canada warbler and Eastern wood-pewee).

A review of available background information identified eight (8) significant bird species in the vicinity of the study area. Further information can be found in Section 2.9.4: Endangered and Threatened Species.

Herpetofauna

A review of available background information indicates that a total of twenty-two (22) species of herpetofauna could occur within the vicinity of the study area. Amphibian species recorded during field surveys in 2010 and 2011 include Green frog (*Rana clamitans melanota*), Northern leopard frog (*Rana pipiens*), Wood frog (*Lithobates sylvaticus*) and American toad (*Bufo americanus*). One snake species, the Northern red-bellied snake (*Storeria occipitomaculata occipitomaculata*) was observed during the snake coverboard surveys; no snake SAR has been confirmed in the study area.

Background information sources identify the potential presence of three (3) significant herpetofaunal species in the vicinity of the study area: the common Snapping turtle (*Chelydra serpentina serpentina*), Eastern milksnake (*Lampropeltis t. triangulum*), and the Blanding's turtle (*Emydoidea blandingii*). Common Snapping turtle (*Chelydra serpentina serpentine*) was the one

turtle species observed during field investigations in 2010 and 2011. Candidate Significant Wildlife Habitat for Protection of Turtle Overwintering Areas and Turtle Nesting Areas are present within the study area.

Blanding's turtle was recognized as a species that potentially occurs in the project area (although no targeted turtle surveys were conducted in the vicinity of the Vermilion River, and no Blanding's turtles were sighted during 2010 and 2011 field surveys). However, for the EA phase of development, a precautionary approach was used, in which Blanding's turtle are assumed to be present and potential impacts mitigated accordingly.

During field surveys of the lines and roads corridors in 2013, four (4) species of reptiles and seven (7) species of amphibians were observed. Five (5) frog species were commonly heard calling during the May fieldwork, and two (2) additional species were heard during June fieldwork. Painted turtles were seen in most lakes and ponds and Snapping turtle (a species of Special Concern) was observed at several locations. Targeted surveys for Blanding's turtles (conducted only in the two corridor options for the proposed roads and transmission lines) did not discover any individuals of this species. Two snake species (Eastern gartersnake and Northern watersnake) were seen in small numbers.

Mammals

A total of twenty-six (26) mammal species are potentially present in the study area. Evidence of species observed during 2013 surveys include Black bear (*Ursus americanus*), Beaver (*Castor canadensis*), River otter (*Lutra canadensis*), Moose (*Alces alces*), Red fox (*Vulpes vulpes*), Mink (*Mustela vision*), White-Tailed deer (*Odocoileus virginianus*), Raccoon (*Procycon lotor*), Red Squirrel (*Tamiasciurus hudsonicus*), Eastern Chipmunk (*Tamias striatus*), and Grey Wolf (*Canis lupus*). All are common, with secure populations in Ontario.

Evidence of Moose was observed within the study area during the summer 2010 field surveys, and three Moose Aquatic Feeding Areas have been identified along the southern edge of Wabagishik Lake. It is anticipated that moose are currently using the vegetation community south of these feeding areas.

A total of fifteen (15) mammal species were observed during 2013 fieldwork in the lines and roads corridors, including at least three species of bat. Additional mammal species (particularly Mice, Voles and Shrews) potentially occur in the study area but were not observed in 2013.

Deer Habitats

The narrows at Wabageshik Rapids provide favourable conditions for deer crossing. These rapids are at a pinch-point of the Vermilion River that presents the safest crossing location for deer dispersing to and from local deer yards or during day-to-day movement.

As documented during the line and access road field investigations, a deer wintering yard is situated along the "New Road Option" (see Figure 3). Additionally, several are located to the northwest (greater than 3 km from the study area), and one is located approximately 9 km to the southwest. During the winter of 2012 and 2013, MNR biologists made observations of deer yarding to the south, in closer proximity to the proposed dam than previously documented on MNR values maps. The highest deer concentrations were found along the north shore of Elizabeth Lake, 2 km due south of the proposed dam, with the nearest part of the yarding activity 500 m due south of the proposed dam. This area provides open south-facing slopes in addition to areas sheltered by coniferous trees (W. Selinger, personal communication, 2011).

2.9.2. Aquatic Habitat and Species

Aquatic resource information for the general project area was collected over several field surveys during the 2010 and 2011 field seasons. These investigations included aquatic habitat characterization, general fish community sampling, spawning surveys for Walleye (*Sander vitreus*), Northern pike (*Esox lucius*) and Lake sturgeon (*Acipenser fulvescens*), as well as benthic invertebrate community sampling. The 2010-2011 field studies consisted of visual surveys of aquatic habitats, summer fish community sampling and Walleye spawning surveys. Lake sturgeon spawning surveys were conducted in May - June 2012 and by Kilgour & Associates on behalf of Vale in the spring of 2012.

The Wabageshik Rapids are characterized by numerous cobble/boulder riffles within a bedrock-controlled valley. A large riffle area, approximately 150 m in length, is located at the upstream end of the rapids and is composed primarily of bedrock and cobble that currently provides appropriate spawning habitat for Walleye, White sucker and possibly Lake sturgeon; this conclusion is further evidenced by the capture of Walleye and White sucker eggs in this riffle during field visits in the spring of 2010. Pools within the riffle also provide refuge and resting areas for fish. Downstream of the riffle, a large pool composed of gravel, cobble and bedrock, with isolated pockets of boulder and sand, create refuge habitat and potential spawning habitat for smallmouth bass.

Downstream of the pool, the channel narrows, passing under the snowmobile bridge and leading to additional pool and riffle areas, including additional spawning habitat for Walleye, White sucker and possibly Lake sturgeon. The proposed dam site is located in the downstream portion

of Wabagishik Rapids in a run area composed mainly of bedrock, with steep bedrock shorelines. Downstream of the proposed dam is a large 100-metre wide riffle section which, at low water, forms a number of small, vegetated islands surrounded by cobble-riffle areas. The substrate in this area is composed of pebble, cobble, gravel and bedrock. The riffle/run sequence located downstream of the proposed dam site provide suitable spawning areas for Walleye, Sucker and Lake sturgeon. Potential staging and resting area for small fish are present in the backwater eddies and slack water areas within this zone.

Species of particular management interest to the MNR in the Vermilion River include Walleye, Northern pike, Smallmouth bass and Lake sturgeon. The MNR has documented Lake sturgeon (*Acipenser fulvescens*) downstream of Graveyard Rapids. This population of Lake sturgeon is listed as threatened under the *Endangered Species Act (ESA)*. The species is also considered threatened by the Committee on the Status of Endangered Wildlife in Canada but it is not yet listed on any of the schedules of the federal *Species at Risk Act (SARA)*, and therefore does not have federal protection under this Act.

Fish community sampling methods included backpack electrofishing, small and large gill netting, minnow trapping, egg matting, spawning surveys, angling, use of trotlines (Lake sturgeon), aerial surveys (Northern pike), and fish sampling for mercury analysis. Benthic invertebrate surveys were also conducted. In 2010, a total of eight (8) fish species were collected and in 2011 an additional thirteen (13) species were collected. One additional species (Lake sturgeon) was collected by Kilgour & Associates on behalf of Vale, for a total of twenty-two (22) species.

The fish species observed during these field surveys were:

- White sucker (*Catostomus commersonii*)
- Lake sturgeon (*Acipenser fulvescens*)
- Northern pike (*Esox lucius*)
- Johnny darter (*Etheostoma nigrum*)
- Smallmouth bass (*Micropterus dolomieu*)
- Rock bass (*Ambloplites rupestris*)
- Shorthead redhorse (*Moxostoma macrolepidotum*)
- Logperch (*Percina caprodes*)
- Longnose dace (*Rhinichthys cataractae*)
- Walleye (*Sander vitreus*)
- Brown bullhead (*Ameiurus nebulosus*)
- Burbot (*Lota lota*)
- Golden redhorse (*Moxostoma erythrurum*)
- Northern redbelly dace *(Phoxinus eos)*

- Yellow perch (*Perca flavescens*)
- Pumpkinseed (*Lepomis gibbosus*)
- Central mudminnow *(Umbra limi)*
- Bluntnose minnow (*Pimephales notatus*)
- Fathead minnow (*Pimephales promelas*)
- Emerald shiner (*Notropis atherinoides*)
- Brook stickleback (*Culaea inconstans*)
- Cisco (Lake herring) *(Coregonus artedi)*

The presence of twenty-two (22) species within the study area is indicative of a diverse fish community that fills a complete range of ecological niches and which utilizes a range of feeding environments within the study area.

For a full description of the results of the 2010-2011 aquatic ecological assessment, including complete lists of all documented species and assessment methods, please refer to the Natural Environment Characterization and Impact Assessment Report which is appended to this document as Annex III.

2.9.3. Valued Ecosystem Components

Key environmental components (also referred to as Valued Ecosystem Components, or VECs) are based on their socioeconomic value rather than their conservation status. Within the Wabageshik Rapids study area, VECs have been determined to be limited to fish species. A summary discussion of the VECs is provided below; a more detailed discussion is provided in Annex III.

Walleye

Walleye populations on the Vermilion River are identified as a VEC as they are a targeted species for both recreational and subsistence fishing. Suitable spawning habitat for Walleye is located within Wabageshik Rapids, in small areas of Graveyard Rapids (downstream of the GS), and in three locations in Wabagishik Lake. During field surveys in the spring of 2010, a ripe male Walleye was captured within Wabageshik Rapids, downstream of the proposed GS. During field visits in 2010 and 2011, Walleye eggs were observed in the Vermilion River upstream of the proposed GS.

Northern Pike

Northern pike on the Vermilion River represent a VEC as they are a targeted species for recreational and subsistence fishing. Northern pike were captured downstream of the proposed dam location in both 2010 and 2011.

Potential spawning habitat exists downstream of the proposed dam location along the southern and eastern shorelines of the large basin directly below Wabageshik Rapids. Spring shoreline flooding effects in areas along the shoreline provides favourable spawning conditions. Potential spawning habitat is also located within the downstream extent of variable flow reach in littoral zones of the large basin approximately 4 km from the proposed dam location.

2.9.4. Endangered and Threatened Species

A list of provincially or nationally designated Species at Risk was compiled from background review and through direct field observations. These species and their general habitats are afforded protection under either the *ESA* or the federal *SARA*. Further information about these species, their conservation status and their preferred habitat can be found in Annex III.

Table 1 below lists the Species at Risk and Species of Conservation Concern that have been identified and/or have suitable habitat within the study area.

Table 1: Species at Risk and Species of Conservation Concern With Suitable Habitat in the Study Area

Common name	Scientific name	Provincial Designation	Federal Designation	Suitable habitat in the study area	Observed during EA field studies
Canada warbler	*Wilsonia canadensis*	Special Concern	Threatened	Yes	Yes [1]
Bald eagle	*Haliaeetus leucocephalus*	Special Concern	n/a	Yes	Yes
Eastern Whip-poor-will	*Caprimulgus vociferus*	Threatened	Threatened	Yes	Yes [1]
Common nighthawk	*Chordeiles minor*	Special Concern	Threatened	Yes	Yes [1]
Eastern wood-pewee	*Contopus virens*	n/a	Special Concern	Yes	Yes [1]
Blanding's turtle	*Emydoidea blandingii*	Threatened	Endangered	Yes	No
Common snapping turtle	*Chelydra serpentine*	Special Concern	Special Concern	Yes	Yes
Eastern milksnake	*Lampropeltis t. triangulum*	Special Concern	Special Concern	Yes	No
Lake sturgeon (Great Lakes-Upper St. Lawrence population)	*Acipenser fulvescens*	Threatened	Threatened	Yes	Yes [2]
Little brown myotis	*Myotis lucifugus*	Endangered	Endangered	Yes	Possible [3]
Northern long-eared myotis	*Myotis septentrionalis*	Endangered	n/a	Yes	Possible [3]

[1] Observed only during the surveys in 2013, along the proposed access road corridors.

[2] Observed by Kilgour & Associates in 2012 on behalf of Vale.

[3] *Myotis* sp. detected on sound recordings on road corridor may have been one of these species.

An isolated population of Lake sturgeon exists between Nairn Centre and Espanola and were suspected to occur downstream of Wabageshik Rapids (MNR, 2011). Three (3) adult Lake sturgeon were captured downstream of Wabageshik Rapids (Kilgour & Associates, 2012).

A review of available background information identified eight (8) significant bird species from the vicinity of the study area: Golden-winged warbler (*Vermivora chrysoptera*), Canada warbler (*Cardellina canadensis*), Bobolink (*Dolichonyx oryzivorus*), Barn swallow (*Hirundo rustica*), Chimney swift (*Chaetura pelagica*), Eastern Whip-poor-will (*Caprimulgus vociferous*), Common nighthawk (*Chordeiles minor*), and Eastern wood-pewee (*Contopus virens*). Although the Golden-winged warbler, Canada warbler, Barn Swallow, Chimney swift and Bobolink are

documented as significant species inhabiting the area, none were observed during the 2010 or spring 2011 field visits.

Four listed bird species, Common nighthawk, Canada warbler, Eastern wood pewee and Whip-poor-will, were observed within the study area during 2013 fieldwork for the line and road assessment. One listed bird species, the Bald eagle, was observed during field surveys of the general project area in 2010 and 2011. It is possible that Bald eagle could be breeding within, or near the study area. The open water pool downstream of Wabageshik Rapids is considered confirmed significant wildlife habitat for Osprey foraging, and Wabagishik Lake is confirmed significant wildlife habitat for Bald eagle foraging.

Two provincially designated mammal species, the Northern Long-eared bat (*Myotis septentrionalis*) and the Little brown bat (*Myotis lucifugus*) are known to overlap with the study area. These species are of conservation concern and may be present in the area. However, they were not observed during field visits.

Based on habitat requirements for Eastern milksnake, it is possible that this species is also present within the study area although it was not seen during the surveys conducted to date.

2.9.5. Significant Wildlife Habitats

The project team has identified species of conservation concern candidates and confirmed significant wildlife habitats in accordance with the Significant Wildlife Habitat Technical Guide (MNR, 2000a; MNR, 2000b; MNR, 2012). Specific discussions and rationale for the selection of these habitats are provided in Annex III. Based on the evaluations completed to date, the following candidate wildlife habitats have the potential to exist within the study area:

- Marsh bird breeding habitats;
- Waterfowl wintering areas;
- Turtle wintering areas;
- Turtle nesting areas;
- Open aspen woodland habitat for Eastern Milksnake;
- Amphibian breeding habitat;
- Reptile hibernacula;
- Denning sites for Mink, Otter, American marten, Fisher and Gray wolf;
- Bat maternity roosting.

Based on the evaluations completed to date, the following confirmed significant wildlife habitats exist within the study area;

- Osprey and bald eagle nesting, foraging habitat;
- Moose aquatic feeding areas;
- Mineral shallow marsh significant wildlife habitat for Common snapping turtle;
- Cervid movement corridors.

In the lines and roads corridors, candidate significant wildlife habitat has been confirmed for the following types, based on seasonal requirements and specialized habitat for wildlife:

- Seeps and springs
- Amphibian Breeding Habitat – Wetland and Woodland
- Rock Barren
- Rare Forest Type – White Oak

In addition, the following candidate significant wildlife habitat has been assessed as possible or probable within lines and roads corridors:

- Waterfowl stopover and staging areas (aquatic)
- Bat maternity colonies
- Turtle wintering areas
- Snake hibernaculum
- Deer yarding areas
- Waterfowl nesting area
- Bald eagle and Osprey nesting, foraging, and perching habitat
- Woodland Raptor nesting habitat
- Turtle nesting areas
- Moose Aquatic Feeding Habitat
- Denning sites for Mink, Otter, Marten fisher and Grey wolf
- Amphibian, cervid, and furbearer movement corridors

For additional detail on these areas, please refer to the Natural Environment Characterization and Impact Assessment Report (NRSI, August 2013) and the Northern Bioscience June 2013 Report entitled "Wabagishik Baseline Environmental Conditions for Road Options", both of which are included in Annex IV of this ER.

2.10. ARCHAEOLOGICAL POTENTIAL AND BUILT HERITAGE

Stage 1 and 2 Archaeological Impact Assessments were completed for the proposed project by Woodland Heritage Services (WHS) to gain an understanding of the archaeological resources potential of the project area. Available reports are appended in Annex V. A summary of key findings is presented below. The location of the proposed dam at Wabageshik Rapids, as with

most sites with waterpower potential, was determined to have high archaeological potential due to its proximity to a major water source and the existence of rapids. An analysis of the topographic map suggests that the optimal location for a portage would be on the south side of the river. The results of the Stage 2 work in the vicinity of the Vermilion River are described in Section 2.10.1 below.

Additionally, a Stage 1 Archaeological Impact Assessment was completed for the proposed transmission line and new road corridors and all temporary construction components, including laydown areas and far side of the river construction access in 2013 (as reported in the *Original* and *Supplemental Documentation* Stage 1 Reports for Transmission Lines & Roads in Annex V of this ER). As a result of the assessment, it was determined that there are no areas of high archaeological potential within these areas and that Stage 2 work was not required for transmission lines, roads and construction laydown areas.

Though not located on the Vermilion River, there is an established portage trail between Elizabeth Lake and Augusta Lake, approximately 2.5 km south of Wabageshik Rapids (as observed in the Power Line and Road Summary Report in Annex VI of this ER).

2.10.1. Archaeological Sites

Prior to the start of the EA process for the proposed development, the registered site database maintained by the MTCS indicated that there were no registered archaeological sites in or near the project area. However, in MTCS's checklist for determining archaeological potential, areas in northern Ontario within 150 m of a major water source are considered to have high cultural heritage potential.

There are no previous archaeological studies on record for the project area. It is important to note, however, that the lack of archaeological studies does not indicate or suggest that there is no archaeological or cultural heritage potential within the project area. The lack of archaeological studies should be interpreted to mean simply that no archaeologist has conducted a study in this area.

A Stage 1 archaeological assessment for the proposed facility footprint in proximity to the Vermilion River was conducted in 2010. Various areas of high archaeological potential were identified along the shorelines, and a Stage 2 archaeological assessment was recommended for these areas; the Stage 2 archaeological assessment was completed in 2011, during which a pre-contact archaeological site ("Belmer Site") was identified. The Stage 2 archaeological assessment report was submitted to the MTCS for review and the MTCS clearance letter was received in January 2013; the Belmer site was also registered with the archaeological sites database of the MTCS and is entitled to protection under the *Ontario Heritage Act*. While the Belmer Site meets

the criteria for a site requiring a Stage 3 survey, Stage 3 work can be avoided if the project will not impact the site in any way. An avoidance strategy was submitted to the MTCS on May 17, 2013.

As noted previously, no archaeological sites were found in the proposed access road, transmission line and construction laydown areas of the proposed project, and therefore, no Stage 2 work was recommended in these areas.

All Stage 1 and 2 archaeological assessments can be found in Annex V of this ER.

2.10.2. Buildings and Structures

Based on the results of the Stage 1 Archaeological Assessment, the potential for the presence of built heritage structures within the project area was unlikely. However, the Stage 2 Archaeological Assessment confirmed that there are no buildings or structures in the project area that may require a built heritage assessment.

2.11. Current Land and Water Use

2.11.1. Land Use/Land Policies

The project is located in Foster Township and will be built on provincial Crown land.

Specifically the development area lies across the Crown land area known as the Highways No 6 and No 17 Hinterlands (G2033), a 53,434 hectare (ha) general use area in MNR's Sudbury district.

There are several existing uses in this Crown land area: recreational, including hunting, fishing, boating, cottaging, commercial tourism, waterpower production (Spanish River, dam sites at the outlet of Agnew Lake and at Nairn Falls); and forestry. As a consequence the potential for resource management problems and land use conflicts is fairly high. This area is located within the Spanish River Signature Site, one of nine such areas featured in the Ontario's Living Legacy Land Use Strategy (1999). Signature Sites are identified for their range of natural and recreational values and their potential to contribute to future recreation and tourism.

According to the MNR's Crown Land Use Atlas Policy Report for this Crown land block, the management objectives are to maintain a reasonably balanced multiple-use area. Land-based primary activities include forestry, mining and aggregate extraction. In water areas (the lakes and 120 metres of surrounding shore lands) primary emphasis will be allocated to commercial tourism and recreation, though the need for energy production at the existing hydroelectric dam sites will also continue to be a Ministry management objective.

Commercial activities allowed on Crown land at the Wabagishik site location include aggregate extraction (generally not permitted in shoreline areas), commercial fishing, bait fishing, commercial fur harvesting, commercial hydro development, timber harvesting, commercial tourism, mineral exploration and development and peat extraction. The Crown land can be disposed of for road development and maintenance, agricultural use and cottaging purposes (MNR, 2006).

2.11.2. Access

There are presently no public access roads leading directly to the site. An existing 7 km gravel private access road leads from the Highway 6 to the area downstream of the rapids.

Additionally, there is a snowmobile trail across patent land, which crosses the Vermilion River approximately 500 m upstream of the GS. The river crossing is a bridge designed for snowmobiles.

2.11.3. Recreation Use and Commercial Tourism

The MNR Site Information Package (SIP) noted that the project area and the surrounding area are valued for cottaging, commercial tourism, and boating.

Xeneca's recreational use surveys (conducted during the October 20, 2011 and July 25,2012 Public Information Centre (PIC) provided feedback from visitors to better assess the impacts and benefits of the proposed Wabageshik Rapids project. These project surveys can be found in Appendix D. The surveys showed that out of 12 comment cards submitted, the majority of users visited the site 10 or more times per year (67%).

Moreover, the Northshore Forest (NF) Management Plan (FMP) describes how the forest is unique with respect to the high number of users, activities and forest types on the unit and can be considered a multiple use forest. It also provides easy access to Crown land for various recreational purposes like private cottages camping and snowmobiling.

<u>Cottages</u>

Seasonal residences/cottages are located in proximity to the project site. They are illustrated as properties on the Wabagishik Downstream Features Map by ORTECH Consulting Inc. (Annex I of this ER).

Camping/Picnicking

According to the MNR SIP Resources Map, the area approximately a few kilometres west from the project has a recreation, hunting or fishing camp. A desktop search revealed the Bear Lake Wilderness Camp located on the eastern corner of Espanola which matches the SIP description.

Furthermore, there are several campsites located on the Panache Lake which are maintained by the Panache Campers Association. The Association funds and maintains the hazard beacons on the lake as well as being the stewards for a safe and clean environment in the area.

Since camping on Crown land is generally free for Ontario residents, there is no tracking information available. However, usage survey results illustrate that roughly 4 out of 12 users use the general area for camping.

Snowmobiling

Snowmobiling is a popular pastime for local residents and tourists in the area. The area around the proposed site is located in the Ontario Federation of Snowmobile Club (OFSC)'s District 12. Thirteen snowmobile clubs and two broader associations are found in the area as noted in Table 2.

Table 2: Clubs and Associations Located in the OFSC's District 12

The Sudbury Trail Plan Association (STP)	The Rainbow Country Snowmobile Association (RCSA)
Onaping Falls Snowmobile Club	Killarney Snowmobile Club
Nickel Belt Snow Spirits	Massey and District Snowmobile Club
Coniston Wahnapitae Driftbusters	Manitoulin Sno Dusters Club Inc.
Valley Trail Masters	Nairn Center Wolverines
Broder Dill Snowmobile Association	Espanola and District Snowmobile Club
Northbound Sno Drifters	
Walden Sno Runners	
Capreol Ridge Riders	

The closest designated snowmobile trail to the project area is located approximately 500 m upstream of the dam site. This trail (a bridge), known as D110, a Feeder Trail, runs roughly 7.1 km in length along Highway 17 near Espanola. The bridge is part of the STP and RCSA, owned by the Walden Sno Runners (and formerly the Nairn Center Wolverines). The snowmobile trail, C-108-D, a Connector trail, runs mostly parallel to the Vermilion River between Espanola and the project site and is maintained by the Espanola and District Snowmobile club (OFSC, 2013). Some

seasonal residents access their properties during the winter months via snowmobiles, crossing Wabagishik Lake. A snowmobile trail is shown on Wabagishik Lake on the MNR Resource Values Mapping in the SIP (Appendix A). The ice trail is marked by the OFSC markers and is maintained by the snowmobile club volunteers who test for ice thickness; existing arrangements with the Sustainable Forestry Licensee ensure unrestricted safe use of the corridor during the winter months.

Based on recreational usage surveys, four (4) out of twelve (12) comment cards (33%) illustrated use of the area for snowmobiling.

Boating/Kayaking/Canoeing

The Vermilion River was historically used as a trade route to gain access to the Great Lakes. Information shared by local landowners during the March 22, 2011 PIC confirmed that canoeists are able to navigate the rapids. Moreover, dialogue indicated that most recreational use occurs downstream at Graveyard Rapids.

To accommodate safer and suitable recreational use around the project, a bypass portage trail will be created and maintained to re-establish access between areas upstream and downstream of the project. This portage trail is described in Section 3.5.2 below; see also the construction sequence plans in the Construction Management Plan for the location of the proposed portage trail (Annex II of this ER).

All-terrain Vehicles

There is limited use of all-terrain vehicles (ATV) in the area surrounding the project site. According to the Road Access Summary report compiled by KBM Resources Group on behalf of Xeneca, access along the existing trail past the Elizabeth Lake Bridge is quite poor, necessitating the use of an ATV.

Snowshoeing/Skiing/Hiking

It was noted in the Wabageshik PIC surveys that the area near the site is used for recreational activities like snowshoeing, cross-country skiing and hiking (33%).

2.11.4. Navigation

The Vermilion River was historically used as a trade route to gain access to the Great Lakes.

Information shared by local landowners during the March 22, 2011 Public Information Centre confirmed that canoeists are able to navigate the rapids. There are no existing portages at Wabageshik Rapids. According to Transport Canada, which administers the *NWPA*, navigable

waters include all bodies of water that are capable of being navigated by any type of floating vessel for transportation, recreation or commerce. As such, the Vermilion River is considered a navigable waterway. The Act prohibits construction in navigable waters unless an Approval is issued for the undertaking. Approvals under the *NWPA* are not issued until the final engineering design stage of the project.

2.11.5. Area Aesthetics

Nature appreciation and bird watching are increasingly popular activities throughout Ontario and are closely associated with the natural aesthetics of an area. As evident from the recreational usage surveys, the general area associated with the Wabageshik Rapids project is extensively used by residents and visitors of the region for various recreational activities and nature appreciation. The Vermilion River has an aesthetic value for local residents and recreational users of the area who use it to enjoy the visual aspects of the river.

2.11.6. Forestry

Forestry is one of the primary resource extraction and management activities occurring around the study area. The study area is situated within the NorthShore Forest (NF), located in the MNR's Northeast Region. The forest is located within the Sault Ste. Marie and Sudbury MNR District's and is administered from the Blind River Area office (OMNR, 2010d).

The Sustainable Forest License holder is Northshore Forest Inc. and the forest is managed by a Board of Directors comprising of four shareholders: Domtar Inc.; Midway Lumber Mills Ltd.; St. Mary's Paper Corp.; and North Shore Independent Forestry Association Inc. Domtar, Forest Resources Division, acts as an agent for Northshore Forest Inc. and carries out all forest management responsibilities on their behalf.

Of the forest's total area of 1,250,487 ha, approximately 86% is Crown land while the remainder is either privately or federally owned. Out of the total Crown land, protected areas lying within the boundaries of the NF encompass a total of 151,904 hectares, of which 116,556 hectares are forested. This represents about 14% of the Crown land area of the forest, and 12% of the forest as a whole. The total Crown Productive Forest area is 853,813 ha as of 2010.

The forest is currently being harvested in accordance with the approved Northshore Forest Management Plan (FMP) (2010 to 2020). The FMP identifies future harvesting, site preparation, and regeneration areas, as well as infrastructure requirements such as expanded logging road networks. The following companies are identified as harvesting and hauling timber from this forest and may be contracted to perform services for Xeneca's Wabageshik Rapids GS project:

- Midway Lumber Mills Ltd.
- Paul Rivett
- H&R Fabris Industry Ltd.
- Morrell Logging Ltd.
- Fabris Lumber Ltd.
- Domtar Inc.
- Sagamok Anishnawbek
- Carlyle Forest Products Inc.
- Huron Forest Inc.
- Eugene Ritchie Logging Ltd.
- Robinson Huron Forestry Company Inc.
- Keith Brock Logging
- Rejean Cyr Logging Ltd./Ltee.
- Joseph Thomas Webb
- 777650 Ontario Inc. (R.J.Whalen Logging)
- Caldwell Timber Ltd.
- Future Wood Products Ltd.
- Thomas Wood Developments Ltd.
- Darcy Alberta
- Beckerton Forest Products Ltd.
- Kenneth W. Chillman
- Ten First Nations
- E&B Logging Ltd.
- Remmie Goodchild
- Ranger Logging Ltd.

The Northshore Forest is exploited for harvested timber products by several local and regional processing facilities. The timber is harvested and supplied by overlapping licensees under the direction and approval of MNR and Northshore Forest Inc.

No known commercial forestry is taking place in the vicinity of the project.

2.11.7. Mining/Mineral/Aggregate Extraction

The Sudbury area is a major mining centre for nickel and other minerals. Exploration drilling at the former McMillan Gold Mine, located near the LaCloche Mountains, 14 km south of Espanola was reported in 2008.

Mineral extraction and development is a permitted use in the Crown land area. There is one mineral claim within a 1 km radius of the project site (Debicki 2010). No known issues have been identified with respect to mineral claims.

The closest source of aggregate is located on the southern perimeter of the Town of Espanola off of Queensway Avenue (License #20842). It is currently operated by Carlyle Development Corp.

Other sources of aggregate in the vicinity of the project location are:

- License #20425 – James Peter Owens: Located 5.5 km NE of the project site.
- License #20284 – Dodge Haulage ltd.: Located 15.1 km SW of the project site
- License #7504 – North Star Sand and Gravel ltd.: Located 11.4 SW of the project site.
  (Source: KBM Roads Access Summary)

There are several active mining claims in the area. According to Ministry of Northern Development and Mines's CLAIMaps website, the closest mining claim to the Wabageshik Rapids site is located approximately 1.25 km to the west. Another block of claims, all held by Sino Minerals Corp., is located approximately 4 km northeast of the project site.

As of 2010, the mining and surface rights within an approximately 0.25 hectares band along the Vermilion River (Wabageshik Rapids location) was withdrawn from prospecting, staking out, sale or lease in accordance with the terms of Order No. W-S-66/10, under Section 35 of the *Mining Act*. The area was withdrawn by the MNR as the proposed site for the Wabageshik Rapids waterpower project including a dam and generating station. The site will be subject to long-term waterpower lease agreement via the *Public Lands Act* (OMNR, 2010c).

2.11.8. Hunting

Hunting is a popular social/recreational activity in this part of Ontario. The Ministry of Natural Resources has identified Wabagishik Lake and the surrounding area as valued area for hunting and fishing.

Large game species include Black bear, Deer and Moose, while small game species include Hare and Grouse. All areas of the province have been divided into geographically distinct Wildlife Management Units (WMUs) for the purposes of managing wildlife populations. There are two WMU in the study area, WMU 42 (south) and WMU 39 (north). Open hunting seasons for the various wildlife species potentially hunted in the vicinity of the site are provided below:

Table 3: Hunting Season Species and Dates

Species Open	Hunting Season
Black bear	August 15 – October 31
Moose	Archery: September 16 – October 5
	Gun: October 7 – November 15
Grouse	September 15 – December 31
Snowshoe hare	September 1 – June 15
Deer	November 5- November 17

In order to manage the Black bear populations and provide resident and non-resident hunting opportunities, Crown Land areas known as Bear Management Areas (BMAs) are assigned to commercial camp owners for the purposes of providing bear hunting services. Resident hunters may hunt wherever there is an open season, provided they have a valid licence and game seal for use in that specific WMU in which they are hunting. There are two BMAs located within the Wabageshik Rapids study area (SU-42-006 and EP-42-005). The locations of the trap line and BMAs are provided on the Values Map found in Appendix A.

Economic returns from hunting in the area are primarily gained through three main species, the Black bear, Deer and Moose. According to the socioeconomic data collected and analysed from the Ontario Federation of Anglers and Hunters (OFAH, 2007) in 2007, the number of Moose hunters (who applied for Adult Validation Tags) in the Northshore Forest was 2681. The percentage of WMU area that is covered under the Northshore Management Unit is 8.9% for WMU 39 and 14.2% for WMU 42. As a result, out of a total of 2182 moose tags applications in WMU 39, only 194 moose tag applications were accounted for (8.9%). Similarly, out of 2763 applications in WMU 42 only 392 moose tag applications were registered (14.2%). The annual expenditures from Moose hunting in the 2010 analysis were $131,680 (WMU 39) and $282,240 (WMU 42). Similarly, the annual expenditures from Deer hunting were $24,960 for WMU 39 and $184,080 for WMU 42; for bear hunting they were $35,000 and $55,000 for WMU 39 and WMU 42 respectively (OMNR, 2010).

2.11.9. Fishing

The Vermilion River, with its many rapids, is a highly regarded fishing destination. Fishing opportunities in the area include recreational summer and winter ice fishing. The site is located within the Fisheries Management Zone 10.

Major sport fish documented in the Vermilion River include Walleye, Northern pike, Yellow perch and Smallmouth bass. Cyprinid species known from the river include Bluntnose minnow

and Fathead minnow. Additional species include Brown bullhead, Lake herring, Longnose sucker and White sucker (WMP, 2006).

Walleye and Pike are the primary species sought by anglers in Wabagishik Lake, Wabageshik Rapids and downstream in the sport fishery. Walleye makes up more than 65% of the harvest in most creel surveys (MacRitchie 1984; Seyler 1997) while Northern Pike on the Vermilion River are a targeted species for recreational and subsistence fishing.

Reports from MNR Sudbury indicate that a remnant population of Lake sturgeon is known to be present in the Vermilion River below Wabagishik Lake. These presumably are part of a population stemming from fish that had traversed the Spanish River prior to the construction of the dam at Espanola. During field tests near the project site, no Lake sturgeon were captured (Annex III).

Members of the angling community informed Xeneca of their use of the trail system both upstream and downstream of the river during the March 22, 2011 PIC.

2.11.10. Trapping and Baitfish Harvesting

Commercial trapping and baitfish harvesting are identified activities within the project area. There are, however two trapping cabins located within the trapping line EP043, a few kilometres south east of the project location. All Crown land open for trapping in the province has a registered trapline system to control trapping. Each trapline represents a specific geographical area, in which the holder of the trapline licence is allowed to conduct trapping activities. Each trapline is issued a quota for the animals which can be trapped within the area. The quota is specific to each trapline, being based on past harvest levels, or recent furbearer population surveys. Only one trapper is licensed to trap in each trapline area.

The Wabageshik Rapids project site is located in the vicinity of licensed MNR trapping lines EP035, EP039 and EP043. There are active baitfish areas allocated in both Nairn and Foster Township.

Furbearers potentially harvested from the study area include Marten, Mink, Fisher, Otter, Bobcat, Lynx, Fox, Wolf, Black bear and Coyote. Open seasons for these species are listed below:

Table 4: Furbearer Open Trapping Seasons

Species	Open Season
Beaver	October 15 – March 31
Otter	October 15 – March 31
Canada lynx	October 25 – last day of February
Mink	October 15 – last day of February
Fisher	October 25 – last day of February
Marten	October 25 – last day of February
Raccoon	October 15 – January 15
Red squirrel	October 25 – last day in February
Black bear	August 15 – October 3
Coyote	September 15- March 31
Bobcat	October 5- last day of February

As mentioned previously, there are no known trapper cabins in the immediate study area. The use of Crown land by licensed trappers for trapper's cabins is authorized by the MNR. Trappers maintain ownership of the cabins but do not hold a property right to the land defined by their trapping license and are not eligible for compensation for lost income due to activities of third parties, natural events or other causes as the issuance of a trapping license is made by the Crown without the expectation or guarantee of income.

2.11.11. Protected Areas

There are no protected areas in the immediate vicinity of the proposed project. As noted in Section 2.9.1, the findings of a "rapid assessment" of wetlands within 500 m of the proposed lines and roads corridors indicated that two wetlands within the proposed corridor options are predicted to be provincially significant.

2.12. Aboriginal Land and Water Use

2.12.1. Reserves and Communities

In Ontario, First Nations (FN) communities have strong historical and traditional ties to the land, rivers and lakes. As such, Xeneca is prepared to work with FN at varying levels, depending on community interests, goals and objectives.

Potentially affected FN communities in the area identified by the MNR include the WLFN, WRFN, Wikwemikong Unceded Indian Reserve and Sagamok Anishnawbek First Nation FN. In the case of our waterpower project, these First Nation communities were originally contacted

and consulted by the MNR during the planning process that lead to the release of this waterpower site. Additional FN communities included in the list are Serpent River FN, Aundeck Omni Kaning FN, M'Chigeeng First Nation, Wahnapitae FN, Sheguiandah FN, and the United Chiefs and Councils of Mnidoo Mnising.

Characteristics of the communities are noted below:

Whitefish River First Nation (WRFN)

The WRFN has a total registered population of 1,200 members (June 2012). Approximately 380 members are living on the First Nation reserve as of 2006. They are located a few kilometres north of Manitoulin Island, Highway 6, 20 km north of Little Current and 25 minutes south of Espanola and Highway 17.

Whitefish Lake First Nation (also known as Atikameksheng Anishinabek)

The WLFN is located approximately 19 km west of the Greater City of Sudbury. The current land base is 43,747 acres, much of it being deciduous and coniferous forests, surrounded by eight lakes, with eighteen lakes within its boundaries. As of June 2012, the total registered population is 1,061 members.

http://pse5-esd5.ainc-inac.gc.ca/fnp/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=224&lang=eng

Sagamok Anishnawbek First Nation

The Sagamok FN (also known as the Three Fires Peoples) is located on the North shore of Lake Huron. Sagamok's culture and language is Anishinawbek and is made up of the Ojibwe, Odawa and Pottawatomi tribes. Approximately 2,700 members were registered in the June 2012 census. As of 2006, there are approximately 885 members living on the reserve with the remainder living in urban locations.

http://pse5-esd5.ainc-inac.gc.ca/FNP/Main/Search/FNRegPopulation.aspx?BAND_NUMBER=179&lang=eng

Wikwemikong Unceded Indian Reserve

Wikwemikong Unceded Indian Reserve is one of the largest 10 reserves in all of Canada. It is located on the eastern side of Manitoulin Island on the shores of Georgian Bay. Wikwemikong's culture and language is Anishinawbek and is made up of Ojibwe, Odawa and Pottawatomi tribes. The total number of band members as of December, 2009 was 7,278 of which

approximately 3,030 live on reserve and another 78 residents from other reserves who live within this reserve.

http://www.wikwemikong.ca/

Wahnapitae First Nation

The Wahnapitae FN, an Ojibwa First Nation, who primarily reside on the 1,036 hectares (2,560 acres) Wahnapitae 11 reserve on the North western shore of Lake Wanapitei, Ontario. The FN is a signatory to the Robinson-Huron Treaty of 1850 as the Tahgaiwenene's Band. The reserve had a resident population of 102 in the Canada 2011 Census; the FN also has approximately 200 further registered members who currently live off-reserve.

Serpent River First Nation

The Serpent River FN is located approximately 140 kilometers west of Sudbury. Two small communities flank the community: Town of Spanish to the east and the Township of the North Shore (Serpent River) to the west. The FN reserve consists of a land base of 26,947 acres along the north shore of Georgian Bay. The total registered FN population as of August 9, 2011 is 1,234 members of which 371 live on-reserve and 863 band members live off-reserve.

http://www.serpentriverfn.ca/whoweare.htm

Aundeck Omni Kaning First Nation (Sucker Creek First Nation)

The Aundeck Omni Kaning FN is located 5 km west on Highway 540 from the town of Little Current, which has the distinction of being the main access point by land to Manitoulin Island. The major city closest to the reserve would be the Greater City of Sudbury, which is approximately 154km west and considered one of the major cities in Northern Ontario.

The Aundeck Omni Kaning FN land mass consists of 897 ha of which 59% is managed by the Band Council while the remaining 49% is held owned by individual Band members through Certificate of Possession.

The total registered membership of the Aundeck Omni Kaning First Nation is 700 with an average 340 members residing within the community.

http://www.aokfn.com/history2.htm

M'Chigeeng First Nation

This FN is located approximately 20 km southwest of Little Current on Manitoulin Island and the reserve area is 3094.7 ha. According to the 2006 Census, there are 760 members living on the FN reserve.

Sheguiandah First Nation

This FN is located 8 km south of Little Current on the North end of Manitoulin Island. The total registered population as of July 2012 was 361. According to the 2006 Census, 160 members live on reserve land.

http://pse5-esd5.ainc-inac.gc.ca/FNP/Main/Search/FNMain.aspx?BAND_NUMBER=176&lang=eng

2.12.2. Spiritual, Ceremonial, Cultural and Burial Grounds

All waterways are viewed in traditional Aboriginal culture as the 'veins or lifeblood of Mother Earth'. Water quality and water ecosystem health and function are typically mentioned as concerns by Aboriginal people in relation to natural resource management and development projects.

Xeneca has engaged with Aboriginal communities from the onset of the project and continues to do so. Our work in engagement continues and it is considered very important by Xeneca.

Information on the engagement of members of the Aboriginal communities during the project development is provided in Section 6.5.

2.13. SOCIAL AND ECONOMIC

The purpose of compiling an economic and a socio-demographic profile is to develop an understanding of the trends, issues and dynamics of the local communities in proximity to Xeneca's projects. The profile also enables Xeneca to identify a sustainable balance between economic growth facilitated by hydropower and socio-environmental objectives. This information can be used to create a socioeconomic baseline against which potential project impacts can be compared.

Information used to characterize the socioeconomic environment has been obtained from various sources including government and local documents and websites (e.g. Statistics Canada, Ontario Provincial Park, Forest Management Plan, and CLUPA), agency correspondence, stakeholder input, literature review and field observations. Information obtained at the PICs, held on March 22, 2011, October 20, 2011 and July 25, 2012, were also incorporated into this section.

2.13.1. Municipal Structure and Community Profile

The proposed Wabageshik Rapids Project is located on provincial land in the geographical township of Foster. The closest municipality to the site location is the Town of Espanola, occupying a total area of 82.44 km² and located about 11 km west of the site location. The Township of Nairn and Hyman (also known as Nairn Center), with an area of 161 km², is located 15 km north of the project whereas the City of Greater Sudbury, with an area of 3,200 km², is within 65 km east of the site location.

Town of Espanola

The Statistics Canada 2011 Population Census lists the population of the Town of Espanola to be 5,364 people. This represents an approximately 1% increase in the population from 2006 levels, which had declined by 2.5% from 2001 levels (Table 5). Approximately 74% of the people of Espanola are fluent only in English, 1% speak only French while 25% people are bilingual.

Table 5: Outline of the Community Profile for Espanola as per the Statistics Canada Census 2001, 2006 and 2011

Canada census – Espanola (Ontario) Community Profile			
	2011	2006	2001
Population:	5,364	5,314	5449
Percentage difference	0.9%	-2.5%	-0.1%
Land area:	82.44 km²	82.44 km²	82.44 km²
Population density:	65.1 persons/km²	64.5 persons/km²	66.1 persons/km²

Town of Nairn & Hyman

The Census lists the population of the Town of Nairn & Hyman to be 477 people which represents a 3.2% decrease from the 2006 levels (Table 6). Approximately 1% of the people are fluent in French, 84% speak only English, and 15% speak both official languages.

Table 6: Outline of the Community Profile for Town of Nairn & Hyman as per the Statistics Canada Census 2001, 2006 and 2011

Canada census – Town of Nairn & Hyman (Ontario) Community Profile			
	2011	2006	2001
Population:	477	493	420
Percentage difference	-3.2%	17.4%	-7.9%
Land area:	160.94 km^2	159.03 km^2	159.03 km^2
Population density:	3.0 persons/km^2	3.1 persons/km^2	2.6 persons/km^2

City of Greater Sudbury

The City of Greater Sudbury is listed to have a population of 160,274 people in the 2011 Census report. This represents a 1.5% increase from 2006 population levels (Table 7). Sudbury is a bilingual city with a large francophone population: Approximately 80% of the population speak English followed by French at 16.3%.

Table 7: Outline of the Community Profile for City of Greater Sudbury as per the Statistics Canada Census 2001, 2006 and 2011

Canada census – City of Greater Sudbury (Ontario) Community Profile			
	2011	2006	2001
Population:	160,274	157,857	155,219
Percentage difference	1.5%	1.7%	-
Land area:	3200.56 km^2	3200.56 km^2	3200.56 km^2
Population density:	50.1 persons/km^2	49.3 persons/km^2	48.5 persons/km^2

In comparison to the aforementioned statistics, Ontario's change in population was 5.7% between the period of 2006-2011 and the national average being 5.9% for the same time period.

2.13.2. Employment & Economic Setting

The Town of Espanola, the northern gateway to Manitoulin Island, was founded in 1899 as a result of an agreement between Ontario and the Spanish River Pulp and Paper Company. It is commonly believed that the community was named for the French word for Spain, "Espagne" or for the word "Espagnola", meaning "Little Spain."

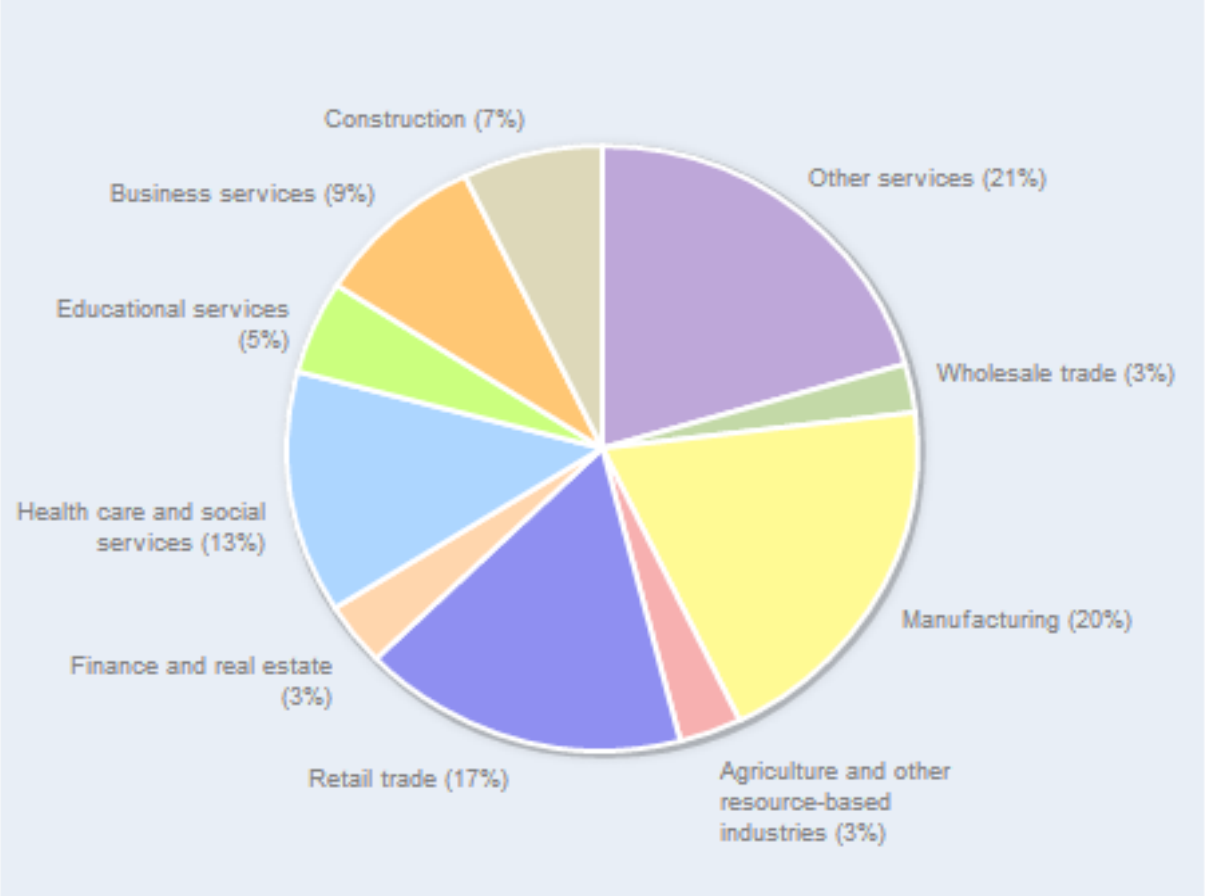
The Town's economy is managed by its continuous association with the pulp and paper industry. Domtar Inc. forms the largest employer in the community, producing 75,000 tonnes

of paper and 344,000 tonnes of pulp annually and providing close to 600 jobs (Town of Espanola, 2011).

With its close proximity to a large city of Greater Sudbury and the affordable cost of housing, the Town of Espanola serves as an economic centre for new residents and businesses alike. It also serves as a retail and service center for the North Shore Region, which includes the Town of Nairn Center and an approximate population of 25,000. It has an annual budget of $15.8 million providing regional health, governmental, professional and business services (McSweeney & Associates, 2010).

With an employment rate of approximately 52%, Espanola has people working in various industries: Forestry, mills and timber-based services employs about 21% of the working population, 20% work in the manufacturing industry, 17% in retail trade and sales, 13% in health and social services and the rest in construction, business, financial and educational services (McSweeney & Associates, 2009) (Figure 4).

Figure 4: Labour Force Breakdown by Industry in the Town of Espanola



Town of Nairn & Hyman

The Township of Nairn & Hyman serves as a location for two major industries, the EACOM Timber Corporation Sawmill and mining giant VALE Inc (Vale) (Township of Nairn & Hyman, 2013). EACOM forms the single largest employer for the local community and is vital to their economy through forestry operations and employment. Furthermore, the company also contributes to the regional forest industry by providing a central resource base between Espanola and Sudbury. Similarly VALE is a multinational mining and metals company which employs a large number of residents of Nairn Center and operates an electricity generating station on the Spanish River within the Town. Aside from these two major industries, there are a number of commercial operations carried out in the Town which places it in a healthy financial position and still leaves plenty of room for growth (Tunnuk Consulting, 2011).

City of Greater Sudbury

Historically, Sudbury came into existence in 1883 as part of the westward expansion of the transcontinental rail line, the Canadian Pacific Railway. Once the rich minerals embedded in the Sudbury Basin were discovered, Sudbury soon evolved into a mining center with the economy dominated by the large metal mining and processing industry for much of the 20th century (Invest Sudbury, 2013). In the late 1900's, mining companies Inco and Falconbridge employed much of the workforce in the area before they were bought over by foreign multinationals in 2006. Inco was acquired by Vale, and Falconbridge was purchased by the Swiss company Xstrata (Toronto Star, 2009).

In comparison to the past, the Greater Sudbury, incorporated as a city in 2001, is presently one of the largest municipalities by area in Ontario. Mining remains the strength of the Greater Sudbury's economy, and rising base metal prices and demand over the past decade has been a boon for the sector. A high percentage of Sudbury's workforce is directly employed in the mining sector, with the impact much larger when considering related manufacturing and service activities (BMO, 2012).

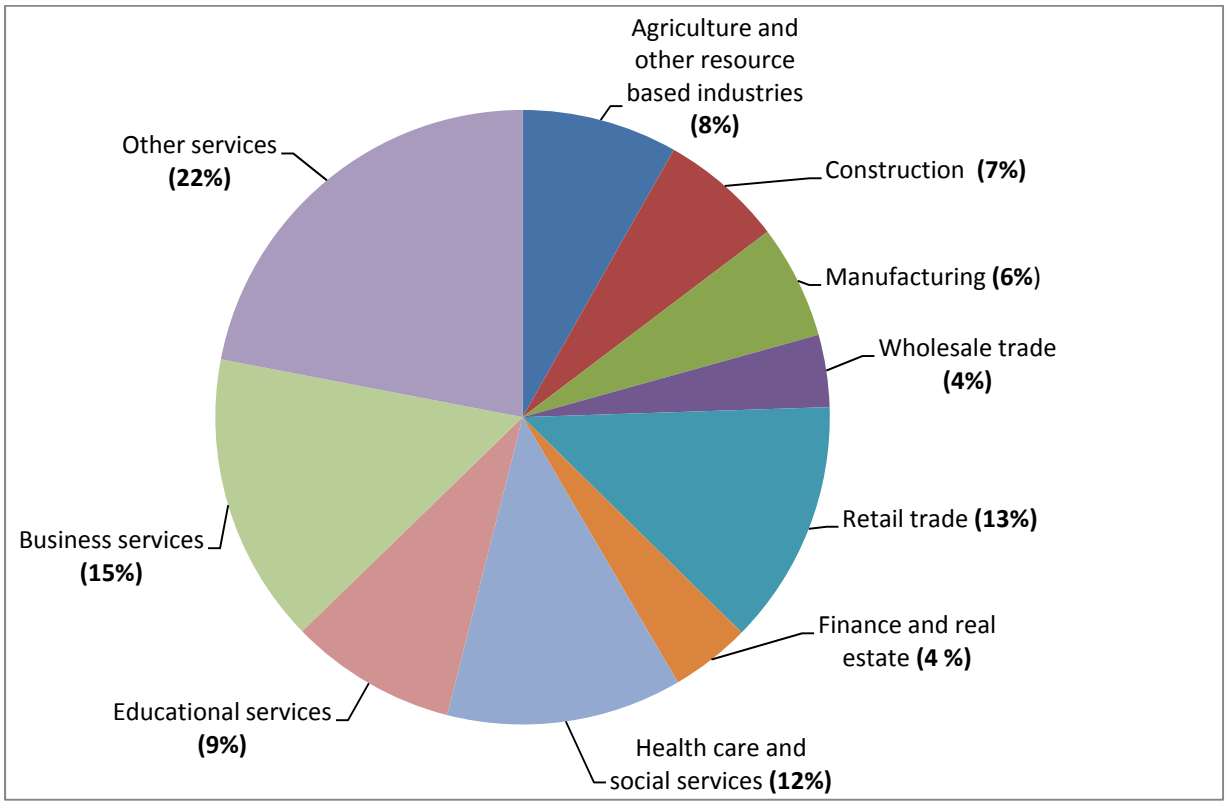
Greater Sudbury has evolved into a world-class mining centre, being home to the largest integrated mining complex in the world. There are approximately 5,000 km of mining tunnels under the Sudbury area (Invest Sudbury, 2013). Additionally, Sudbury has over 345 mining supply and service companies located in the City with a unique history and operating culture.

Aside from mining, the City's position as a regional center for the North-Eastern Ontario and its growing economy is due to several emergent factors. Growth in finance, business, tourism, health care, education, government, and science & technology research sectors have been instrumental to Greater Sudbury's success. Moreover, enhanced quality of the life improvement initiatives

along with the region's success in rehabilitation and green projects has earned Sudbury to stand out as a 'Green' sustainable city (Ontario Immigration, 2013).

Employment in Sudbury has recouped all of the declines suffered during the recession of 2008, but job growth remains modest. With an unemployment rate of 7.8% as of Q1 2013, employment in the industries are divided as follows: Mining and other services employ about 22% of the working population, 15% work in the business industry, 13% in retail trade and sales, 12% in health and social services and the rest in construction, manufacturing and educational services (Citydata Sudbury, 2007) (Figure 5).

Figure 5: Labour Force Breakdown by Industry in the City of Sudbury



2.13.3. Water Supply

As noted in Section 2.7, a search of the MOE electronic Water Wells database did not return any well records within a 1-km radius of the project site. Seasonal residences are present in the project area; use of the Vermilion River for personal consumption was reported by at least one seasonal resident and is therefore assumed to be a possible water supply source for all residents along the river.

3. DESCRIPTION OF PROPOSED PROJECT

This section provides a description of each element of the proposed development. The reader is referred to Annex II for conceptual diagrams and the Construction Management Plan showing relevant features of the development.

The intent and purpose of the EA planning process is to describe the project and its potential impacts on the natural, social and economic environment, to determine suitable mitigation measures (i.e. project design modifications) which can reduce or eliminate negative impacts, and to identify suitable compensation measures for impacts that cannot be mitigated. The process is meant to inform and enhance the project plan through investigation and consultation with stakeholders, Aboriginal communities and the general public. During an EA, conceptual design information is presented in addition to data collected through field investigations, desktop studies, and agency consultation. The aim is to ensure that the public, agencies and Aboriginal communities are informed about and understand the general scope and extent of the project, particularly as it relates to understanding how the project may impact their interests, other uses of the river and the environment. Detailed engineering design and specification work is required at the permitting and approval stage for construction and operation, subsequent to a successful EA outcome.

The proponent necessarily reserves the right to variances between the conceptual design presented herein and the final detailed engineering design, provided that such variances do not materially and negatively impact the environment beyond the scope of the impacts described herein. The studies and impact assessment completed throughout the EA process were conducted using a conservative approach, to minimize the likelihood that new, unassessed impacts arise from minor variances to the design. The proponent, however, recognizes that any changes to the project, where it is determined that there is a potential for new negative effect(s) to the environment, will require the application of the addendum provisions for the ER as per Section 8.8 of the Class EA for Waterpower Projects (April 2012), and as summarized in Section 1.3.1 of this ER. An addendum to a Final ER will also be subject to mandatory regulatory and public review.

Possible variances from conceptual to final design include:

1. Detailed design may incorporate changes that are specifically meant to address and/or accommodate stakeholder issues identified and resolved during the consultation process.
2. Construction materials may vary from those shown on conceptual drawings. Earth material may be interchanged with concrete or steel material as required in the final

engineering design. Where alternative material is specified, volumes and footprints may be adjusted to reflect safe engineering design requirements.

3. Physical sizes and orientation of structures.
4. Physical size of construction site areas may be adjusted where it is required for safe site management.
5. Specifications of mechanical and electrical equipment may vary, including the physical size, number of units, and total rating.
6. Design specifications for protection of fish, such as inflow velocities and inlet spacing of trash racks.
7. The powerhouse angle and alignment may be adjusted. The location of spillway and powerhouse structures may be adjusted along the dam axis to optimize engineering design and safety.
8. Road and connection line routes may be refined.

As stated previously, if any changes to the project are determined to have the potential for a new negatitve effect(s) they may be subject to the addendum provisions of the Waterpower Class EA.

3.1. Description of Proposed Hydroelectric Facility

Xeneca is proposing to construct a hydroelectric facility at Wabageshik Rapids on the Vermilion River, approximately 0.8 km downstream of the outlet of Wabagishik Lake. The project site is located approximately 50 km southwest of the City of Sudbury, 11 km east of Espanola, and 6 km south of the Trans-Canada Highway.

The proposed project at Wabageshik Rapids would utilize a gross head of approximately 6 m and require the inundation of approximately 0.4 ha of terrestrial land. The conceptual development for the facility incorporates a spillway dam that will direct flow from the river to an intake structure which will conduct water through one or two turbines with a total nameplate rating of 3.4 MW.

Access to the site will be from the south side of the Vermilion River off of Panache Lake Road (also referred to as Penage Lake Road). Two different options for accessing the project site were explored; these are described in Section 3.4 of this report, and are discussed in greater detail in Annex VI.

3.2. Design Options and Rationale

It should be noted that in the early stages of the EA planning process, until mid-2011, the Wabageshik Rapids GS was proposed at a location approximately 300 m downstream of what is currently being proposed and presented in this ER. That previous option also involved the construction of a conveyance channel and a tailrace canal with a length of more than 100 m.

The access road and transmission line route that were proposed at the time also followed separate paths leading up to the facility. These previous project designs were presented at the March 2011 PIC.

The proposed site was subsequently moved 300 m upstream in order to avoid an important spawning bed and to ensure the maintenance of a known deer crossing site on the river. Additionally, a close-coupled design with a shorter bypass reach was adopted. Two different options are currently being considered for the access road and transmission line, but both will ultimately be built in the corridor selected to minimize the project footprint.

3.3. GENERATING STATION COMPONENTS

The following is a description of the generating station components. The reader is referred to Annex II for conceptual engineering drawings in support of the information detailed below. It should be noted that final engineering drawings for the components of the proposed undertaking must be submitted for regulatory review at the permitting and approvals stage to secure permission to initiate construction. The details presented below are based on conceptual engineering design calculations and subject to some modification at the final design stage.

Artistic renderings of the proposed Wabageshik Rapids GS are included as Figures 6 to 8 below. The renderings show the proposed headworks structure, the powerhouse and substation under varying flow conditions (Figure 6: Spring High Flow; Figure 7: Summer Time Mid-Flow; and Figure 8: Fall Low Flow).

Figure 6. Artistic Rendering of the Proposed Wabageshik Rapids GS Project under Typical Spring Time High Flow Conditions

Figure 7. Artistic Rendering of the Proposed Wabageshik Rapids GS Project under Typical Summer Time Mid-flow Conditions

Figure 8. Artistic Rendering of the Proposed Wabageshik Rapids GS Project under Typical Fall Low Flow Conditions

3.3.1. Installed Capacity and Annual Energy Output

The approximate installed capacity of this project will be 3.4 MW, generated by one or two turbine units. This will provide approximately 14,190 MWh of renewable energy annually. The production of 14,190 MWh of renewable energy represents the equivalent of:

- The displacement of 1440 metric tons of carbon dioxide equivalent (based on current electricity generation in Ontario); or
- The annual greenhouse gas emissions from 300 passenger vehicles; or
- The sequestering of carbon from nearly 478 hectares of pine or fir forests.

3.3.2. Headworks Structure

The proposed headworks structure will feature an approximate 33 m long concrete and earthfill dam. The relative amount of earthfill to concrete will depend on the final project design. The spillway will have an approximate footprint of approximately 200 m^2 based on conceptual engineering design.

The dam and embankment may be constructed from any or all of the following materials within the engineering constraints for the same; reinforced concrete; RCC – rolled and compacted concrete; earthen/stone, clay and 'rubber' (impermeable barriers). Typical construction will feature a broad overflow weir topped by a control feature (i.e.: an Obermeyer or similar, pneumatically operated dam). Headgate structures may be either included in the dam design or built as a separate riverside structure dependent upon water conveyance routing.

An orifice will be installed in the weir so that a continuous compensatory flow can be passed into the river immediately downstream (see Section 5 for the operating strategy and a discussion of compensatory flow requirements); the proposed Operating Plan can be found in Annex I.

3.3.3. Intake and Conveyance System

A 200 m^2 area upstream of the powerhouse will be excavated for the facility intake. The intake excavation will start approximately 45 m upstream of the powerhouse and slope down to reach an approximate elevation of 190.75 masl at the powerhouse. Based on the conceptual construction plans (see Annex II), the cofferdams required for the construction of the facility intake would temporarily exclude and dewater 500 m^2 of river bed.

The powerhouse at the facility will be close-coupled to the dam and intake; therefore no conveyance system will be required.

3.3.4. Powerhouse

The proposed powerhouse will have a footprint of approximately 400 m^2 and will be incorporated into the main dam structure. This surface area includes the intake and tailrace footprint; the powerhouse building itself will occupy 25% (100 m^2) of this area.

The powerhouse will also be fitted with a valve through which environmental flows will be passed into the river during intermittent operations (see Section 5 for a further discussion of the operating strategy).

3.3.5. Turbines

Turbine selection is based on the project site head, flow and economics. In instances of low head and intermediate to large flows, Kaplan, Propeller or Cross Flow (Banki-Ossberger) type turbines are deemed most efficient. For very low heads, a horizontal Kaplan is the preferred option as it requires less excavation than the vertical turbine and can maximize turbine efficiency over a wide range of flows. Regarding additional economics of the turbine selection, cost varies directly with the maximum operating flow, but because a large component of cost is fixed for a development regardless of the flow, an optimum size results through balancing the cost versus the revenue generated from turbines of various sizes (diameters).

Based on the rationale described above, one or two horizontal or vertical Kaplan turbines may be selected for the Wabageshik Rapids site due to low head (6 m) and intermediate flows (Long Term Annual Flow 47.3 m^3/s). The specifications for two different options for the turbines are outlined in Table 8 below.

Table 8. Turbine specifications for the two potential options for the Wabageshik Rapids GS

Turbine specifications	Option 1	Option 2
Type	Kaplan	Kaplan
No. of turbines	1	2
Diameter	2850 mm	2320 mm
RPM, turbine	150	170
No. of blades	4	4
Trash rack gap	48 mm	48 mm
Entrance velocity	0.75 m/s	0.75 m/s

3.3.6. Tailrace

The facility's tailrace will have an overall area of 100 m^2 and extend approximately 30 m downstream of the powerhouse. The excavation will be to an elevation of 281 masl at the powerhouse outlet and taper up to 194.50 masl towards the end of the canal.

3.4. Access Roads and Connection Lines

Access road planning to the project site involved the identification and avoidance of values where possible and included consultation with the Sustainable Forest License (SFL) holder for the project area. The goal is to have shared use of the access road with the SFL holder and potentially develop a road sharing and maintenance agreement.

New road construction will require the clearing of a 30 m ROW. Access road details are provided in Annex VI. Access roads to the non-powerhouse (north) side of the river will be temporary and will be decommissioned and rehabilitated following construction.

In order to minimize the overall project footprint, the access roads and connection lines will follow the same corridor. A Power Lines & Roads summary for the Wabageshik Rapids Hydroelectric Project has been prepared and is appended to this document as Annex VI. The methodology used to identify potential corridors, as well as the two corridor route options currently being considered, are summarized in the next sections.

Preliminary Identification of Potential Corridors

A preliminary connection line route was prepared based on the location of the facility. The point of common coupling (PCC) and the point of connection (PC) are identified in the conditionally-approved FIT application. The proposed line locations were then overlain with assembled values layers and a summary of the potentially impacted values was compiled and summarized. Data layers used for this exercise included:

- Land Information Ontario dataset
- Natural Resources Canada (NRCan) Topographic data
- 2008 Forest Resource Inventory data
- Medium resolution SPOT panchromatic orthoimagery from NRCan
- NRVIS Data Layers (circa Feb 2011)

Consultation with the SFL holder for the project area was also undertaken and the SFL holder provided information about road networks, planned harvest block locations and aggregate pit locations. Additionally, high-resolution, digital aerial photography was undertaken in mid-2011 to aid in the characterization of habitat and the identification of important environmental values.

The connection line and access routes were further reviewed in late 2011 using all available information, and revised where appropriate in an effort to:

- reduce environmental impact (i.e. streams & wetland crossings);
- minimize landscape footprint and fragmentation;
- coincide with existing road corridors; and
- reduce total line length.

A wetland "rapid assessment" was conducted in 2013, in order to identify wetlands within 500 m of proposed roads and transmission lines that are likely to be provincially significant.

Two possible routes are currently being proposed for accessing the Wabageshik Rapids project site from Panache Lake Road, outlined below. Please also refer to Figure 3 in Section 2.9.1 above, for a map illustrating the path of the two route options. As noted previously, both the access road and the connection line will follow the corridor that is ultimately selected. In both corridor options, the connection line would originate at a PCC located near the southern outskirts of the town of Espanola.

Irrespective of the final route selected, a temporary access road will also be built in the immediate vicinity of the Wabageshik Rapids GS in order to access the non-powerhouse (north) side of the river. This temporary access road will be abandoned following construction. The location of this road is illustrated on the construction sequence plan in the Construction Management Plan (Annex II).

<u>New Road Option</u>

The "New Road Option" consists of 16.1 km of combined existing road and new access road to the east of Elizabeth Lake that connects Panache Lake Road to the project site. Approximately 5 km of this option would be composed of newly built road access. This route would cross an existing snowmobile trail 900 m south of the Wabageshik Rapids GS, and would also require four new water crossings east of Elizabeth Lake, along with the use of seven (7) pre-existing water crossings.

<u>Snowmobile Trail Road Option</u>

The second possible route (the "Snowmobile Trail Road Option") consists of 14.3 km of combined existing and new access roads, and would travel alongside an existing recreational snowmobile trail. Approximately 5 km of this route would require the construction of new road. This option crosses patent land and will require landowner agreements if selected. This option also requires the use of eleven (11) existing water crossings and two (2) new water crossings.

A bridge structure is in place spanning Brazil Creek next to the Elizabeth Lake boat launch, and is currently designated strictly for snowmobiles. The selection of the Snowmobile Trail Road Option for accessing the project site would require an upgrade to the bridge to highway capacity. (Note: a discussion of the impact of selecting this option on the snowmobile trail and bridge is discussed in Section 7.2.14).

3.5. ANCILLARY WORKS

The following describes the ancillary works proposed for the project.

3.5.1. Electrical Substation

A transformer substation will be required and located adjacent to the powerhouse at the site. The dimensions of the substation have been included in the estimation of the powerhouse footprint. The transformer area will be surrounded by security fencing.

3.5.2. Portage Trail

A portage trail will be added to provide recreational users of the river a route to bypass the Wabageshik Rapids GS. A permanent safety boom will be installed upstream of the facility, which will direct users to the portage trail on the south shore of the river. Signs will be installed to guide users, and steps and handrails will be installed to allow safe passage in steeper sections. The trail will rejoin the river channel approximately 30 m downstream of the tailrace of the Wabageshik Rapids GS.

Site maps showing the route of the temporary portage trail (to be provided during construction) and the permanent portage trail are included in the Construction Management Plan in Annex II of this ER.

3.5.3. Other Civil Works

There is an existing snowmobile bridge across the Vermilion River, approximately 500 m upstream of the proposed development site. While this bridge will not be used for construction traffic, it does fall within the project's upstream zone of influence.

4. CONSTRUCTION STRATEGY

The following is a summary of the construction activities and temporary works required during the construction of the project. A construction management plan, including conceptual drawings, has been prepared and is presented in Annex II. It should be noted that final engineering details for these temporary works will be submitted for applicable regulatory approval in advance of the construction stage of the undertaking. The details presented below are based on conceptual engineering design calculations and subject to some modification at the final design stage.

4.1. CONSTRUCTION SCHEDULE

Assuming a Statement of Completion is filed by December 2013, site preparation activity would be slated to begin in 2014. Construction of the proposed facility is scheduled to take place between 2014 and 2016, with commissioning of the facility slated for 2017. Tentative dates for the commencement and completion of various project components are presented in Table 9.

Table 9: Project Component Construction Schedule

Component	Dates	
Roads, Bridges and Site Preparation	Start	Sep 2014
	Finish	Apr 2015
Powerhouse/Intake/Tailrace	Start	July 2015
	Finish	Jun 2016
Weir	Start	July 2016
	Finish	Mar 2017
Connection Line and Associated Components	1st Phase	Jan 2015 to May 2015
	2nd Phase (if required)	

The following construction stages are proposed for the construction of the generating station and its appurtenant facilities:

- clearing and grubbing of the ROW;
- road upgrades and construction of new road access including construction of temporary bridge;
- construction of phase 1 cofferdam;
- excavation of powerhouse, intake and tailrace;
- construction of the powerhouse and two spillway bays;

- substation construction;
- connection line ROW clearing and line construction;
- headpond clearing;
- removal of phase 1 cofferdam and installation of phase 2 cofferdam;
- completion of spillway structure and tailrace;
- electrical and mechanical installation within the powerhouse;
- removal of phase 2 cofferdams;
- equipment installation and other electrical works required to meet project completion schedule;
- site rehabilitation/reclamation and removal of temporary works.

Construction will be initiated once all applicable regulatory approvals and authorizations have been issued. The construction program will be advanced to meet the requirements of relevant legislation, industry guidelines and best management practices aimed at ensuring the highest level of protection of the environment. Specific proposed mitigation measures that will be integrated into the site's construction strategies are presented in Section 7 and explained in further detail throughout the supporting annexes of this report. In-water construction-related timing restrictions will be stipulated by the regulatory agencies during the permitting and approvals stage. Some general construction strategies are presented below.

4.2. CONSTRUCTION ACTIVITIES

4.2.1. Clearing and Grubbing

Trees cut within the inundation area and along the ROW for the connection line and access roads will have their roots left intact wherever possible. Efforts will be made to remove as much organic material and woody debris as possible from the area of inundation to reduce the potential effects of mercury methylation.

Right of first refusal for all merchantable timber will be offered to the sustainable forest license holder for all areas being cleared, including inundation zones and access road and connection line corridors.

4.2.2. Construction Materials and Laydown Areas

Granular material for the construction of roads, embankments, yards, cofferdams and concrete structure backfill will be sourced from local licensed aggregate sources. The aggregate source(s) will be selected via a tendering process. The total volume of borrow materials required is presently unknown since this is dependent on the final project design. Proposed laydown areas

totalling approximately 3000 m^2 on the south bank are shown on the construction sequence drawing located within Annex II.

4.2.3. Cofferdams

Temporary cofferdams will be installed in the river during the construction process to divert flow first from the powerhouse area, then the spillway area to allow the construction to occur in dry conditions. Drawing no. 06-151 in the Construction Management Plan (Annex II) identifies the proposed cofferdam locations.

Cofferdams will be constructed of cargo bags filled with clean, granular material re-purposed from excavation activities and/or transported to the site from local licensed aggregate sources. Cofferdams would be installed using an excavator and/or a crane to place the bags sequentially in the river. The footprint of the cofferdams will depend on the height/elevation of the dam required to manage the 1:20 year flow rate and the depth to suitable substrate within the river. It is anticipated that the cofferdams will be three cargo bags wide at the base and three cargo bags high, resulting in an approximate footprint of 750 m^2, although this estimate may change by up to 1.5 to 2 times. Drawings for the cofferdam will be submitted with the engineering package for approval under the LRIA during the regulatory permits and approvals phase of the development process.

4.2.4. Dewatering

Water that accumulates behind the cofferdams will be discharged in accordance with the *Environmental Protection Act*. The MOE will confirm the requirements for a Permit to Take Water (Category 2 or 3) and an Environmental Compliance Approval for Sewage Works prior to the initiation of in-water construction activities. Dewatering approvals will require the proponent to submit a Sediment and Erosion Control Plan and possibly, a surface water monitoring plan for regulatory review.

4.2.5. Excavation of Powerhouse and Tailrace Channel

Excavation for the powerhouse and tailrace will be completed using appropriate methods. Tailrace excavation at the intersection with the river will be completed within the MNR's established timing window for in-stream work. The excavation will be advanced from the powerhouse working towards the watercourse so that flowing water does not infiltrate the cut until the final phase of excavation.

Due to the presence of spring-spawning fish species, the in-stream work will be scheduled to avoid the April-to-June timing window. Additionally, terrestrial clearing would occur between September to April, in order to avoid disturbances to any breeding birds and bats.

If vegetation clearing is unavoidable from May through August, then breeding bird nest surveys will be undertaken before any clearing is performed. Trees and vegetation containing active nests shall remain in place during the breeding season. Project work should avoid disturbance to the nested vegetation with a designated buffer area of 30 m. Additionally, surveys of bat colonies will be conducted if vegetation clearing cannot avoid the May-August window. If bat colonies are present within the clearing area, appropriate mitigation activities will be undertaken after consultation with the MNR.

4.2.6. Concrete Production

As noted in Section 1.2.3 (Part B) of the Construction Management Plan (Annex II), a concrete batch plant will not be required for the production of concrete for the construction of the facility, due to the proximity of local concrete suppliers in Espanola and Sudbury.

4.2.7. Connection Line

Clearing of the power line right of way and the construction of the line will occur in the least impactful and most cost-effective way possible. As the power lines will be installed adjacent to the access roads, the construction of the lines can proceed during winter or summer with relatively minor impact. Overland sections of power line right-of-way will most likely be cleared in winter with tracked vehicles working on snow-covered, frozen ground.

4.2.8. Management of Waste Materials During Construction

Solid nonhazardous construction waste (e.g. material packaging) generated during the construction process will be removed from the site to an approved disposal location.

No gaseous wastes other than construction equipment emissions are anticipated. Industrial liquids such as paints, sealants, fuels and lubricating fluids will be stored in secure containment areas and disposed of in accordance with provincial and federal liquid waste disposal regulations (e.g. *Environmental Protection Act*, *O. Reg. 347*, and *Transportation of Dangerous Goods Act*).

An appropriate waste disposal site and management company will be formally contracted during the permitting and approval stage of development, when the volume of waste, the nature of the waste materials, and the size and content of the waste are confirmed. Xeneca is proposing to employ the services of a privately-owned waste management company (Dodge Waste Management) in Espanola. When contacted by Xeneca, the waste management company confirmed that they are licenced to and will accept non-hazardous construction waste from Foster Township.

Riverside Enterprises, a provider of waste management transport services in the Espanola area, was contacted by Xeneca and confirmed that they would be able to transport solid non-hazardous waste from the project site to the Dodge Waste Management site. It was also confirmed that Keith R. Thompson Inc. (KRT), located in Lively, Ontario, has the capability to transport and dispose of liquid hazardous waste from the project site.

4.2.9. Water Crossings

As outlined in Section 3.4, the construction of the access road and power line route will require the use of new and existing water crossings, the exact number of which will depend on the final route selected.

Fisheries and Oceans Canada Overhead Line Construction Operational Statement (v. 3.0, 2007) will be adhered to in order to minimise impacts to fish and fish habitat associated with construction or upgrades to all water crossings.

4.2.10. Temporary Portage Trail

In order to provide recreational users of the Vermilion River with the means to bypass the construction site, a temporary portage trail will be constructed. A permanent safety boom will be installed in the river upstream of the powerhouse and appropriate signage will direct users to the construction office trailer where they must check in before progressing into the site. Steps and handrails will be installed as needed in the steeper portions of the portage trail.

Prior to any blasting activities, the portage trail will be checked and cleared of any users, and the entry points will be guarded to prevent entry until it is safe to resume use of the trail.

At the end of construction activities, a permanent portage trail will be established, which will follow a more direct and less steep route. Permanent signage will direct users of the river to the trail. As with the temporary portage trail, the new route will have steps and rails in steep sections as needed.

The routes of the temporary and permanent portage trails are illustrated in the conceptual site plans in the Construction Management Plan (Annex II of this ER).

5. OPERATION STRATEGY

This section summarizes how the facility will be operated and how the operation will be adapted to maintain key seasonal functions such as aquatic life and recreational use. The proponent's proposed Operating Plan for Wabageshik Rapids is presented in Annex I, and summarized in below.

The operations strategy is based on the conceptual engineering completed to date, and environmental data collected during the field investigation program. The operations strategy was developed based on data analysis from various studies, including:

- Lidar Survey: mapping of the upstream and downstream river reach using remote sensing technology;
- Conceptual Design: drawings of the structures as conceptually proposed for the project (included in Annex II of this ER);
- Hydrology Study: an analysis of the natural river flows (included in Annex I of this ER);
- Bathymetric Study: field study of water depths upstream and downstream of the project location and a spot measurement of flows for hydraulic model calibration;
- Hydraulic Studies: detailed hydraulic engineering analyses to better understand the various hydraulic parameters relevant to assess operational and environmental matters. The work included one-dimensional steady-state HEC-RAS modeling upstream and downstream of the proposed development, as well as unsteady-state flow modeling in the downstream area affected by operation of the project (see Annex I of this ER);
- Stream flow data: The rating curves produced by the HEC-RAS model were compared against stream flow data collected at four stream gauges installed by Xeneca on the Vermilion River. It was found that the rating curves produced by the HEC-RAS model compared well to the rating curves developed from the stream flow data of the stream gauges (see the September 20, 2012 memo titled, "Wabageshik Rapids Rating Curve Development" in Annex I of this report);
- Erosion survey: a desktop survey of upstream locations that could be sensitive to future shoreline erosion after project construction (Annex I of this ER);
- Fluvial geomorphic assessment: Determining and quantifying bank and bed erosion potential and general sediment transport associated with the proposed generating station (Annex I of this ER);
- Environmental field investigations: studies of the natural habitat and key environmental features (Annex III of this ER).

The operations strategy may be refined subsequent to regulatory review and comment, and once the project enters the final design stage, provided that such variances do not materially and negatively impact the environment beyond the scope of the impacts described in this ER.

5.1. HEADPOND INUNDATION

An important factor in modified run-of-river operation is the availability of water storage upstream of the facility. The proposed Wabageshik Rapids facility would result in the creation of a headpond that connects to Wabagishik Lake, approximately 0.8 km upstream of the facility. This new headpond (i.e. excluding Wabagishik Lake) would have an area of 4.8 ha, including the inundation of 0.4 ha of terrestrial land. The headpond is hydraulically connected to the lake, such that a change in water levels upstream of the facility could in turn impact water levels in Wabagishik Lake. The upstream zone of influence is therefore considered to include the lake, and spans a total length of approximately 11.5 km.

As a result of modified run-of-river operations, headpond water levels will fluctuate from on-peak to off-peak hours. Water levels will rise during off-peak hours as outflow from the plant is reduced to below the natural rate of river inflow, whereas the opposite will occur during the next business day as production and plant outflows are increased above the natural rate of river inflow. Operations will aim to follow natural lake levels, and limit the effect of daily operations on lake level fluctuations to a maximum range of 0.1 metre (± 5 cm). Due to the facility being located downstream of the lake outlet, a drop in water levels immediately upstream of the facility cannot cause a drop in levels in the lake that are lower than what would occur naturally. Furthermore, results from the dynamic modeling indicate that during extremely rare flooding events, water levels in Wabagishik Lake will not be increased as a result of operations at the Wabageshik Rapids facility. The limited amount of fluctuation in headpond water levels is not expected to have a significant negative impact on shoreline erosion, aquatic habitat, and civil structures and private property (to be discussed in greater detail in Section 7 of this ER).

Additionally, should the government direct Xeneca to maintain water levels in Wabagishik Lake at a specific level, the facility will be operated in this manner to the extent possible, provided that doing so does not conflict with the objectives described previously for maintaining headpond water levels.

The daily fluctuation in headpond water levels was modeled under different inflow conditions (long term average flow, 60% exceedance flow, 70% exceedance flow, etc.) and under the average daily inflow for each month of the year; the results are illustrated in graphs in Appendix 1 of the proposed Operating Plan, in Annex I of this ER.

5.2. SITE OPERATING STRATEGY

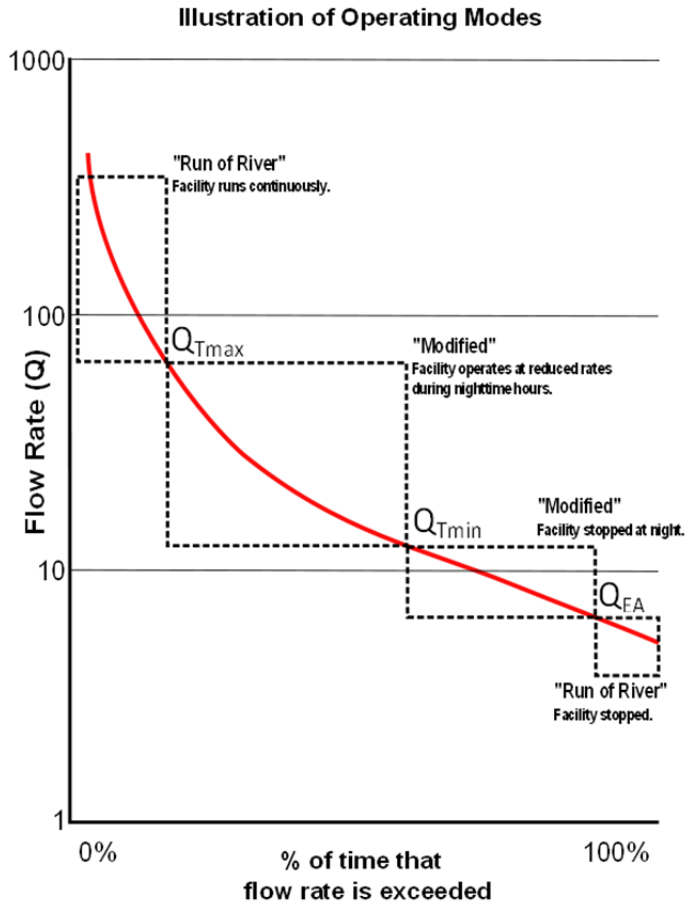
The electricity to be generated from the proposed generating station was contracted to the OPA under a FIT Contract. The FIT program encourages the producer to generate electricity between

the hours of **11 am and 7 pm (on-peak hours) from Monday to Friday**, when needed most in Ontario.

As a "*modified run-of-river*" generating facility, the operations of the Wabageshik Rapids GS would vary between run-of-river and intermittent operation depending on the flows present in the river. When the Wabageshik Rapids GS operates as a true run-of-river facility (e.g. during high flow or very low flow events), flows downstream of the facility would be unchanged compared to pre-development conditions, and operations would not result in fluctuations in water levels in the headpond. During other times of the year, the facility would "modify" the flows in the river by storing water in the headpond during off-peak hours for release during on-peak hours. This mode of operation takes into account the objective of building and operating the project in an environmentally sensible manner, while trying to achieve the Province's objective of generating electricity to supply peak demand.

Figure 9 below illustrates the mode of operation that would occur depending on the amount of natural flow in the river.

Figure 9: Modes of Operation



The proposed undertaking will have a limited ability to store water in the headpond, thus limiting the depth and area of inundation upstream, and by extension, the magnitude and spatial extent of the associated environmental impact. This, in addition to the limited amount of storage available for operation relative to the natural flow of the river, differentiates modified run-of-river projects from hydroelectric projects with large storage reservoirs capable of storing water for weeks or months and which have the ability to "peak" when seasonal periods of hot or cold weather raise the demand for electricity. Modified run-of-river projects typically have less environmental impact than such peaking hydroelectric projects.

5.3. SPILLWAY FLOW ALLOCATION

Flows in the Vermilion River at the Wabageshik Rapids GS will be allocated between the powerhouse and spillway. The proportion of flows going into each structure will depend on the amount of inflow into the project area and the operating status of the powerhouse. Flow will be allocated in such a way that ecological flow requirements identified during the environmental assessment process are met. The relative apportionment of flow between the spillway and powerhouse under different flow conditions are described below.

During high flow events, such as spring run-off (freshet) conditions and during/after significant precipitation events, flows in the river will typically exceed the maximum turbine capacity of the facility (64 m^3/s), so any excess flow is directed over the spillway. The combined flow of the water passed through the turbines (64 m^3/s) to generate electricity and the water bypassed over the spillway (the excess flow) will be equal to the natural flow of the river.

Under moderate flows falling within the range of the turbine flow capacity (19.2 to 64 m^3/s), which occur much of the time and during various times of the year, the majority of flows are passed through the powerhouse. A compensatory flow (Q_{COMP}) of 0.5 m^3/s or 2 m^3/s (depending on the season; see Section 5.6 below) will be passed over the spillway at all times, in order to ensure proper circulation in the pool immediately downstream. The facility may operate at reduced rates at night in order to store water in the headpond for release during the day; water is nonetheless passed through the powerhouse continuously during such times.

During low flow conditions, all flows are typically passed through the powerhouse. However, since the amount of flow is generally insufficient for continuous operation, flows through the powerhouse are interrupted intermittently (i.e. the facility is shut down at night). During such interruptions, only a minimum environmental flow (Q_{EA}) will pass through the Wabageshik Rapids GS and into the river downstream; Q_{EA} varies from 5 to 8 m^3/s, depending on the season (note that Q_{EA} does not apply in the spring, when all flows are automatically passed over the spillway and/or through the powerhouse, so the downstream reaches receive the full flow rate; see also Section 5.6 for further discussion on Q_{EA}). When the volume of water in the headpond

has increased to a sufficient level, operations will resume and flows of up to 25 m^3/s (the maximum turbine flow during intermittent operations) will be passed through the powerhouse.

During very low flows, flows in the river are too low for any type of operation, and any inflow must be directed over the spillway in order to maintain the ecological function of the river downstream. The powerhouse will not be operating during such times.

5.4. VARIABLE FLOW REACH

The Variable Flow Reach spans from the area immediately downstream of the facility to a distance downstream where the variability in flow is attenuated by the presence of a lake or a confluence with a significant tributary. Within the Variable Flow Reach, water depth, flow velocity and wetted channel perimeter can change substantially from on-peak to off-peak hours under modified run-of-river operations. Common concerns associated with modified run-of-river operations include potential impacts to aquatic habitat, navigation, public safety and civil structures, and ice scour. The operating parameters of the proposed undertaking will ensure that ecological flow requirements are met, take into consideration any downstream navigation constraints, and avoid significant negative impact on public safety and civil structures.

The magnitude of the daily fluctuations in flows in the Variable Flow Reach will depend on the operating mode of the facility and the natural flows in the river at that time. When the facility is running continuously, but at a reduced rate at night, daytime flows will typically be no more than four times greater than nighttime flows. When the facility is shut down at night, during which time only a flow equivalent to Q_{EA} is being released, daytime flows can be as much as 10 times larger than nighttime flows; additionally, the lower the natural river flow, the longer the facility will cease operations and store water. Under purely run-of-river operations, the variation in flows (if any) from daytime to nighttime would be the same as they would be in the absence of the project.

To reduce the potential for impact within the Variable Flow Reach during intermittent operations, the following approach was employed when selecting operating parameters:

1. Timing of event: Special attention was given to the timing of aquatic habitat events and the relationship to the range of natural flows that could occur during these periods. The temperature ranges at which important life stage events for Walleye, Lake sturgeon and Northern pike occur were identified, and appropriate operation strategies for such stages were developed. The proposed Operating Plan outlines a commitment to operational restrictions for key species, which are outlined in Appendix 2 of the proposed Operating Plan.

2. Controlled ramping of flows: To minimize the sudden release of water that occurs during start up, the increase or decrease in flows exiting the turbines will over gradually over the span of 60 minutes.
3. Limiting maximum turbine flow: During intermittent operation, the turbine flow will be set to not exceed an upper limit (25 m^3/s) to minimize the amount of flow variability that occurs on a daily basis.

The proposed operating parameters have been designed with the objective of avoiding significant impacts on the downstream habitat. It should be noted that operating parameters for turbine flows depend on the final design and equipment selected at construction. As such, some variation in the identified parameters may occur, however the objectives of the mitigation and ecological flows provided will remain as stated.

The maximum turbine flow during intermittent operations was *previously* proposed to be 41.6 m^3/s. Following the distribution of the Draft ER and subsequent discussions with regulatory bodies, this value was lowered to 25 m^3/s, as presented above, in order to limit the daily fluctuation in downstream flows during intermittent operations. This reduction was determined to be consistent with the commitment to limit water level fluctuations at a reference point 400 m downstream to a range of ±15 cm from the daily average. The hydraulic modelling conducted in support of the discussions with regulatory bodies is presented in the October 29, 2012 report ("Vermilion River Site #6 – Wabageshik Rapids, Additional Peaking Scenarios – Hydraulic Modeling") in Annex I.

Additionally, the Wabageshik Rapids GS will be operated in such a manner that peaking cycles occur no more than once per 24-hour period, such that the volume of water over this time period will remain approximately equal.

5.5. SUMMARY OF HYDRAULIC CHARACTERISTICS

Estimated water levels:

Normal operating headwater level	[Natural lake level]
Minimum operating level	204.0 masl
1:100 year flood flow	507 m^3/s
1:100 year low flow	1.07 m^3/s
Long-term average flow	47.3 m^3/s

5.6. Operating Parameters for Water Control Structures

In establishing the operation parameters for the proposed facility, the environmental aspects of the project site and surroundings were considered so as to provide a reasonable balance among operational constraints, environmental features and mitigation of possible impacts.

It should be noted that daily changes in upstream levels and downstream flows related to operation occur only when the facility is in modified run-of-river operations mode. While the facility is in run-of-river mode and subject to the amount of natural flow in the river, the upstream levels will be maintained at a constant level and downstream flows will equal to the natural flow in the river.

Operation Parameters

The following operating parameters for managing upstream water levels were selected:

- Normal lake level: The water level at the facility shall be maintained at a level that results in a lake level that is equal to the lake level under natural conditions.
- Fluctuation of lake level: The water level at the facility shall be maintained at a level that does not cause fluctuations in lake level that have an adverse effect on recreational uses and the environment. The effect on lake level fluctuations due to daily facility operation shall be within ± 5cm.
- Desired lake level: Where government directs Xeneca to maintain the lake level at a desired level, and where such desired level does not conflict with the objectives described above, the facility shall be operated in a manner that achieves the desired lake level to the extent reasonably possible.

The operating parameters that can be used to manage downstream flows/levels are:

- Upper Turbine Limit (Q_{TL}): The maximum amount of flow generated by the facility operation while intermittent turbine operation is occurring. The turbine(s) can be operated in a range of flows and outputs ranging from minimum turbine capacity to the maximum turbine capacity. When it is desirable to minimize the difference between on-peak and off-peak flows, the upper limit of turbine operation can be set as an operating parameter. Setting the upper limit has to take into account that the turbines do not operate very efficiently below roughly 65% of their maximum capacity. For the proposed Wabageshik Rapids GS, a Q_{TL} of 25 m^3/s is proposed.
- Turbine Ramp Time: This parameter defines how quickly a turbine can shift from being stopped (i.e. not operating) to the desired operating flow. Turbine start up involves going from being stopped to the minimum turbine capacity in a short period of time. Once the

turbine is operating, the turbine capacity can then be increased gradually to the desired operating flow. By increasing the flow gradually, downstream impacts can be reduced. For the proposed Wabageshik Rapids GS, a turbine ramp time of 60 minutes is proposed.

- Turbine Down Ramp Time: Essentially the reverse of Turbine Ramp Time. The time during which a turbine is taken down to minimum turbine capacity prior to shut down. By decreasing the flow gradually, downstream impacts can be reduced. For the proposed Wabageshik Rapids GS, a turbine down ramp time of 60 minutes is proposed.
- Environmental Flow (Q_{EA}): The amount of flow that is provided to the Variable Flow Reach during intermittent operation when the turbine is stopped. It should be noted that the environmental flow provided through operations cannot be larger than the natural flow upstream in the river. For the proposed Wabageshik Rapids GS, a Q_{EA} between 5.0 and 8.0 m^3/s is proposed, which will be passed downstream through a valve installed in the powerhouse (see Table 11 for the proposed Q_{EA} values for different months/season). These values were selected following analyses of different Q_{EA} and their effect on water flows and levels in the tailrace area; see the documents "Additional Hydraulic Analysis – Downstream of Tailrace Area" (November 21, 2012) and "Area Just Downstream of Tailrace – Photographs at Various Flow Conditions" (November 23, 2012) in Annex I of this ER. Note that Q_{EA} does not apply in the spring, when all flows are automatically passed over the spillway and/or through the powerhouse, so the downstream reaches receive the full flow rate.
- Compensatory Bypass Flow (Q_{COMP}): The amount of flow that is provided at all times to the bypass reach, between the control structure and the powerhouse tailrace outflow; the bypass reach for the Wabageshik Rapids GS spans a length of approximately 25 m. A compensatory flow of 2.0 m^3/s during the spring and 0.5 m^3/s for the remainder of the year is proposed, which will be passed through an orifice built into the weir.

Potential operational impacts to environmental components vary significantly depending on the mode of operation and flow conditions which are in turn typically dependent on seasonal conditions. For the purposes of the proposed Operating Plan, the operating seasons have been determined by reviewing a hydrograph of average annual flows and periods of special environmental significance (e.g. fish spawning). Table 10 summarizes the start and end dates for each season as they relate to the operations of the Wabageshik Rapids facility.

Table 10: Seasonal Hydrological Periods

Spring	March 20th – May 24th (66 days)
Summer	May 25th – October 11th (140 days)
Fall	October 12th – December 24th (74 days)
Winter	December 25th – March 19th (85 days)

Table 11 provides a summary of the flow hydrology information for the project site, and the proposed operating parameters which have been determined for the facility. It should be noted that the turbine flow parameters may be adjusted during the detailed engineering design and as commercially available equipment options are selected, provided that such adjustments do not materially or negatively impact the environment beyond the scope of the impacts described in this ER.

Table 11: Wabageshik Rapids GS Proposed Operating Parameters

Description	Acronym	Project & Streamflow Conditions (m^3/s)			
		Spring	Summer	Fall	Winter
Streamflow Exceeded 99% of the time	Q_{99}	13.2	2.78	4.45	5.92
Streamflow Exceeded 95% of the time	Q_{95}	19.3	5.19	8.89	8.89
Streamflow Exceeded 80% of the time	Q_{80}	43.2	9.40	21.6	13.5
Streamflow Exceeded 50% of the time	Q_{50}	102	18.9	37.7	20.5
Streamflow Exceeded 20% of the time	Q_{20}	193	38.2	63.4	29.9
Downstream environmental flow target [1]	Q_{EA}	No Int. Op.	5	Oct. = 5.0 Nov. = 6.5 Dec. = 8.0	Jan. = 8.0 Feb. = 6.5 Mar. = 6.5
Minimum compensatory flow in spillway area [2]	Q_{COMP}	2.0	0.5	0.5	0.5
Maximum turbine flow capacity	Q_{TMAX}	64.0			
Minimum turbine flow capacity	Q_{TMIN}	19.2			
Max. Turbine flow during intermittent operations	Q_{TL}	25			
Max. turbine flow during continuous operations	Q_D	64			
Long term annual flow, average annual mean	LTAF	47.3			
Median streamflow value	Q_{MED}	27.3			
2 year return period 7-day-average-low flow	7Q2	6.84			
10 year return period 7-day-average-low flow	7Q10	3.50			
20 year return period 7-day-average-low flow	7Q20	2.89			
High streamflow event; occurrence of 1 in 2 yr	Q1:2	268			
High streamflow event; occurrence of 1 in 100 yr	Q1:100	507			
Turbine Ramp Time	N/A	60 min			
Turbine Ramp Down Time	N/A	60 min			

[1] Q_{EA} values below 6.5 m^3/s are subject to the development and approval of a water sharing agreement between Xeneca and Domtar, given the latter's minimum flow requirements for the dilution of effluents at its dam in Espanola. In the absence of such an agreement, environmental flows of at least 6.5 m^3/s will be passed downstream during intermittent operations.

[2] Flows above the minimum Q_{comp} values will be provided into the spillway when inflow exceeds 64 m^3/s. Compensatory flows ranging from 2.0 m^3/s to 0.5 m^3/s will be achieved via a variable flow adjustment.

The frequency with which each type of operating mode is employed will vary seasonally. The proposed frequency of each mode of operation was determined using available hydrology, design parameters and operating restrictions (see Table 12).

Table 12: Operating Mode Occurrence by Season

Operating Mode	InFlow	Spring	Summer	Fall	Winter	Annual
Run-of-River (Continuous Operation)	$>Q_{Tmax}$	67%	8%	20%	4%	20%
Modified Run-of-River (Continuous Operation)	$>Q_{Tmin}$	28%	42%	63%	57%	47%
Modified Run-of-River (Intermittent Operation)	$<Q_{Tmin}$	4%	45%	16%	38%	31%
Run-of-River (Facility Not Operating)	$<Q_{EA}$	1%	5%	1%	1%	2%
		100%	100%	100%	100%	100%

Additional operating constraints are proposed for the Wabageshik Rapids GS, in order to minimize any potential impacts to fish spawning and other users of the river (see the proposed Operating Plan in Annex I). These include:

- The facility will go into run-of-river operations during walleye spawning, beginning when water temperatures reach 4°C and ending 33 days after the water reaches 12°C;
- The facility will go into run-of-river operations during lake sturgeon spawning, beginning when water temperatures reach 8°C, and transitioning into modified run-of-river operations between 25 and 46 days after the water first reaches 16°C.
- Daily water level fluctuation due to operation will not exceed the operating band of the Domtar dam's headpond (located downstream of the Wabageshik Rapids GS).
- Daily water levels fluctuations due to operations will not exceed ± 15 cm of the daily average in the pool located 400 m downstream of the facility.
- Natural lake level and outflow to be maintained in Wabagishik Lake. The total releases of water over a 24-hour period will be equal to the total flow that would have been observed under pre-disturbed conditions.
- When natural inflow into the project area is sufficient to support minimum generation requirements (i.e. flows are greater than the sum of minimum turbine capacity (19.2 m^3/s) and the Q_{COMP}), intermittent operations will not occur.

The rationale behind the operating restrictions for mitigating impacts to Walleye and Lake sturgeon spawning is provided in the June 14, 2013 memo titled, "Walleye and Lake sturgeon Parameters for the Development of the Operations Plan for the Wabageshik Rapids Hydroelectric Generating Station" (see Annex III of this ER). The memo reports the typical temperature ranges at which spawning and larval drift are known to occur for the species.

Outflows from the Wabageshik Rapids GS were modeled under different inflow conditions and average daily inflows observed for each month of the year; the modeled outflows can be viewed in the graphs in Appendix 1 of the proposed Operating Plan, in Annex I of this ER.

5.7. SPECIAL EVENT OPERATION

Operation during special events, such as floods, droughts and safety emergencies may need to deviate from the normal operating parameters to manage flows and mitigate impacts.

- Normal Flood Operation: Normal flood events are defined as flows that exceed the maximum capacity of the plant up to and including the one in two year flood event level. Flood events of this magnitude are normal occurrences in the river and present minimal concern for public safety or environmental impacts. During these periods, the facility is operated to manage water levels upstream below the maximum upstream operating water level where possible. This is achieved by allowing any water that is in excess of the maximum turbine capacity to bypass the facility through the spillway.
- High Flood Operation: High flood events are defined as events that exceed the one in two year flood event level but are within the safe design level of the facility. Flood events of this frequency are anticipated to occur only infrequently over the life of the facility. The objective of this type of operation is to ensure public safety. This is typically achieved by allowing any water that is in excess of the maximum turbine capacity to bypass the facility through the spillway and by operating the spillway and the power generation facility in a manner that achieves this objective.
- Extreme Flood Operation: Extreme flood events are defined as events at which the facility cannot be attended safely by operators and where the risk of flooding of the generation equipment is possible. The emphasis on operation is on ensuring public and operator safety. Where advance warning is received that an extreme event may occur, the operation of the facility will be adjusted in advance of the flood peak to maximize its ability to pass water and provide minimal obstruction to the passing of flood waters.

The inundation map and river profile mapping provided in Annex I show the water depths and extents for various flood conditions. The objective of flood operation for the spillway, turbine and bypass is to ensure that the backwater inundation effect is minimized and kept within the projected distance limits.

5.8. COMPLIANCE CONSIDERATIONS

For compliance purposes, the Target Operating Zone will be the legal operating limits as provided in Section 7 of the proposed Operating Plan (see Annex I) for the Wabagishik Rapids GS. The facility will be considered out of compliance with this proposed Operating Plan when

outside of these defined operating parameters. Xeneca will be required to submit an Incident Report following standard compliance procedures outlined by MNR whenever the headpond water levels or downstream flow targets deviate outside the Target Operating Zone.

During periods of drought or extreme flooding events equipment constraints may prevent water levels or flows from being maintained solely within the Target Operating Zone. Xeneca will not be required to submit an Incident Report whenever the operating parameters deviate outside the Target Operating Zone under these conditions. Xeneca will keep on record the occurrence of these events and resultant conditions.

When flows are above the maximum turbine design capacity (64 m^3/s), Xeneca will have no ability to control water levels upstream or downstream of the facility. Water levels and flows will rise and fall in accordance with natural inflows until flow decreases back to or below the design capacities. For compliance purposes, no Incident Report will be required if flows exceed the design capacity of the facility. However, when inflow rates decrease below the facility design capacity, Xeneca will become subject to the Target Operating Zone Parameters as discussed above.

5.8.1. Effectiveness Monitoring Program

A post-construction environmental monitoring program is outlined in Section 12.2 and includes assessment of the effectiveness of mitigation proposed, including effectiveness of the proposed Operating Plan in achieving the objectives/constraints outlined in Section 5.6.

5.8.2. Compliance Monitoring and Reporting Program

Xeneca will be required to report the following for the facility:

- one instantaneous discharge (flow) reading at 15 minute intervals;
- one instantaneous headpond water level reading at 15 minute intervals, and
- one instantaneous water level reading at 15 minute intervals 400 m downstream of the facility.

For total instantaneous discharge readings, this would be a combination of gauged/measured flows through the facility and calculated discharge from the spillway. For the purposes of compliance monitoring, the headpond water level will be monitored from a water level gauge located on the upstream side of the powerhouse. Downstream water levels will be monitored within a pool area located 400 m from the spillway.

Water temperature in the headpond will also be monitored on an hourly basis and this data will be reported with the flow and water level reading data.

This information will be reported annually in a compliance monitoring report to the MNR. The information will be provided in an electronic format that can be graphed as well as in a written format.

An out-of-operating zone situation will require the submission of an Incident Report as noted in Section 5.8.

5.9. Provisions for Plan Reviews, Amendments and Plan Renewals

The operation of the facility will be aligned with a proposed Operating Plan developed in conjunction with other generating facilities on the river system. Xeneca suggests that the proposed Operating Plan be accepted based on the Class EA process. Additional issues raised by the MNR and stakeholders identified in the SVRWMP will be addressed as part of the future comprehensive reviews.

6. FEDERAL, PROVINCIAL AND MUNICIPAL AGENCY AND STAKEHOLDER CONSULTATIONS

This section presents the methods and scope of stakeholder consultation conducted for this proposed development.

6.1. CONSULTATION GUIDELINES

One of the main objectives of the Waterpower Class EA process is to coordinate and integrate the requirements of regulatory agencies under the provincial *EAA* and any applicable federal legislation. This involves gathering information from public, private and Aboriginal stakeholders to identify environmental concerns and to inform project decision makers.

To meet this objective and to effectively engage with agencies and stakeholders, the Waterpower Class EA builds on the public notification requirements mandated under the *EAA*, and other provincial processes (i.e. *Lakes and Rivers Improvement Act*, *Public Lands Act*, *Ontario Water Resources Act*, etc.) which recommend that consultation and engagement planning be incorporated as an integral component of the planning process.

Xeneca's consultation programs are designed to provide the outreach to identify potential stakeholders, engage stakeholders and provide the means and opportunity for participation in the development planning process. The goals of the consultation programs are to:

- Identify and notify potentially interested and affected stakeholders;
- Identify and assess the range of positive and negative environmental and socio-economic effects of the project;
- Address the concerns of adjacent property owners, local and regional interest groups, individual members of the public and Aboriginal communities that may be directly affected by the project.

To achieve these goals, the consultation programs strive to:

- Identify potentially affected stakeholders;
- Describe how the project may affect the natural and socio-economic environment;
- Provide notification to identified stakeholders as prescribed by the Waterpower Class EA;
- Inform the public, Aboriginal communities and regulatory agencies where, when and how they can engage in the process;
- Identify public and Aboriginal community benefits, concerns and issues related to the project;
- Address public, Aboriginal community and regulatory agency concerns and issues raised regarding the development and operation of the project;

- Document public, Aboriginal community and regulatory agency input and how concerns were addressed, issues avoided and mitigation measures put into place during project planning.

The records of agency, public, and Aboriginal community consultation undertaken in the planning of this development proposal are provided in Appendices C, D and E, respectively.

6.2. CONSULTATION STRATEGIES

The consultation programs undertaken by Xeneca were intended to meet all mandatory consultation requirements of the Waterpower Class EA as well as to assist in the identification and resolution of environmental concerns relating to the project. Xeneca is responsible for all procedural aspects of consultation, including but not limited to notification, engagement, and consultation with First Nations and Aboriginal communities. All public consultation events, communications, and advertising with the public at large was coordinated and executed by Xeneca staff and consultants. Public and Aboriginal Community Consultation Plans for the proposed development are presented in Appendices D and E, respectively. Key components of the consultation plans including the specific tools and approaches to consultation are described below.

6.2.1. General Print and Mailing

General mailing of reports, notices and letters through postal, courier and electronic methods were used. To promote environmental sustainability, the EA team did attempt to minimize printed media; however, hard copy print was used where electronic formats were not guaranteed to reach the intended target audience and where specifically requested.

6.2.2. Print Media

Print advertising in support of the initial NOC was circulated in the Espanola Mid-North Monitor (July 28, 2010; August 4, 2010; August 25, 2010; September 10, 2010) and the Sudbury Star (July 28, 2010; July 31, 2010; August 21, 2010; August 25, 2010). A revised NOC was subsequently circulated, also in the Espanola Mid-North Monitor (November 10, 2010 and November 17, 2010) and the Sudbury Star (November 10, 2010 and November 13, 2010).

To ensure broad formal notification in advance of each PIC, meeting advertisements were posted two weeks in advance of each meeting in both the Espanola Mid-North Monitor and the Sudbury Star (on March 22, 2011; October 20, 2011; July 25, 2012), as well as on the Xeneca website. The Notice of Completion was advertised in the Espanola Mid-North Monitor and the Sudbury Star in mid-September, 2013.

6.2.3. Web Media

Xeneca has provided regular project status updates through emailing and through its website throughout the EA process to complement the consultation and engagement program. Key documents (Project Description, etc.) and notifications were provided through emailing and Xeneca's website at www.Xeneca.com; preliminary distribution of the Project Description was through the OEL-HydroSys Inc. website at www.wesa.ca. In some cases, Xeneca personnel also employed other social media communication tools to garner and provide feedback to the public.

6.2.4. Meetings

Direct and/or teleconference meetings with various stakeholders such as municipalities, and public interest groups were a component of the consultation initiative intended to assist in the identification and resolution of environmental concerns. A summary of these events is presented in Sections 6.3.3 and 6.4.

Meetings were held with identified Aboriginal communities as part of the EA consultation requirements and the business to business Aboriginal consultation initiatives that are part of MNR's site release process. As part of these meetings, consideration of the concerns of First Nations and other Aboriginal communities located in the vicinity of, and/or having a potential interest in the project was afforded. To help facilitate these activities, Xeneca was prepared to assist interested Aboriginal communities in accessing government information, programs and funding.

First Nations and Aboriginal communities located within, or having traditionally used the project area, were identified in the MNR Site Information Package provided to the proponent and through dialogue with the Ministry. A copy of all notifications of the proposed undertaking provided by the proponent to First Nation and Aboriginal communities can be found in Appendix E. In addition, Xeneca solicited participation of Aboriginal communities in the Stage 2 archaeological study for the site and requested their participation in project planning.

6.2.5. Public Information Centres (PICs)

In addition to direct correspondence, three PICs were held to collect information on concerns as well as to allow the EA team to inform members of the public and to provide direct and immediate feedback. The date and time for the PICs was advertised in local publications and notification was sent either electronically or via post to participating members of stakeholder groups and government agencies well in advance of the scheduled date. The PICs were held on March 22, 2011, October 20, 2011 and July 25, 2012.

Members of Xeneca staff as well as key discipline experts from the EA team were on hand to answer public questions and to address concerns related to the project. Attendees were asked to provide their contact information, to identify whether they wished to be provided with project updates, and to provide feedback on the project. A summary of these events is presented in Section 6.4.

6.3. GOVERNMENT AND AGENCY CONSULTATION

The EA team was responsible for regulatory agency consultation. Xeneca issued a Notice of Commencement for the proposed undertaking on July 28, 2010. The Project Description document was provided to regulators on November 19, 2010. A revised Notice of Commencement was issued on November 10, 2010, and a copy of each Notice is provided in Appendix D. A record of consultation, including meeting minutes is presented in Appendix C.

The EA team invited federal, provincial and municipal agency representatives to an EA Coordination meeting on February 8, 2011 to introduce the project, collect preliminary comment on the project and details on the project site, and discuss project scoping and regulatory approvals. Comments and issues raised by the individual agencies are summarized in their respective sections below.

A summary of agency consultation is presented below. For the reader's convenience, a summary of the issues identified during the regulatory agency and public consultation process is provided in tabular format as Table 33 (Identified Issues and Management Strategies). The table also identifies the proposed resolutions to the issues. Additional measures potentially required at the permitting or operation stage are also outlined in Section 7 of this report.

6.3.1. Federal

It is important to remind the reader that the proponent initially approached the EA planning process with a view to presenting one harmonized environmental assessment report document to meet the requirements of both provincial and federal planning processes. Since the enactment of the new *CEAA 2012*, a federal environmental assessment is no longer required for this project. Therefore, the information contained in the following section is based on the preliminary project approach and should therefore be considered in the light of the regulatory setting it was undertaken in despite the current requirements for EA planning. There is merit in recounting the entire planning process accurately so the entire federal consultation record has been included in order to provide a comprehensive account of the planning process. Additional consultation with federal regulators may be required subsequent to the release of this document and prior to obtaining authorizations or approvals required under applicable federal legislation.

6.3.1.1. Canadian Environmental Assessment Agency

The CEA Agency was provided with a project overview by Xeneca in June 2010. The CEA Agency confirmed it would be acting at the FEAC for the proposed project. The CEA Agency requested a detailed Project Description and clarification as to whether federal funding was being contemplated for the project. The proponent was advised that federal agencies to be contacted through the FEAC would include EC, DFO, Health Canada, AANDC, NRCan, and Transport Canada. Xeneca was informed that project documents may be made available to the public, and that information related to the EA would be posted on the Canadian Environmental Assessment Registry.

The Project Description was provided to the FEAC and each of the above referenced federal agencies in November 2010.

An EA Coordination meeting for the proposed project was held in Sudbury on February 8, 2011. The CEA Agency was in attendance via teleconference. The Agency noted that, to satisfy the federal requirements, the ER would have to assess the connection line and access roads associated with the undertaking. The Agency identified Transport Canada and DFO as the Responsible Authorities (RAs).

In a March 17, 2011 letter to the proponent, the CEA Agency recommended that Xeneca follow a coordinated EA process, which would result in the submission of a single body of documentation for each project that satisfies both federal and provincial EA requirements. The CEA Agency advised the proponent that the collection of adequate baseline data was required to support the assessment of potential environmental effects, noting that this information would be required before a responsible authority could reach an EA decision. In response to a proposed timeline for the issue of Environmental Reports, Xeneca was advised that the federal review process would be determined in part by the quality of the report, the complexity of project-specific issues and the level of associated public and Aboriginal community concerns.

The Agency issued a Scoping Document for the proposed undertaking on June 6, 2011 to detail the information that would be required in the EA screening report to constitute the basis for the RAs to render a decision under Section 20 of the *Canadian Environmental Assessment Act.* The Scoping Document (a copy of which is provided in Appendix C) identifies a list of environmental components to be assessed for the Wabageshik Rapids Hydroelectric Development, including:

- Surface geology and soils
- Surface water quality and quantity
- Hydrogeology, groundwater quality and quantity
- Air quality and climate

- Fish and fish habitat
- Vegetation and wetlands
- Wildlife and wildlife habitat (including migratory birds)
- Species at Risk
- Environmental changes resulting in effects on other environmental components

Included in the Scoping Document are requirements to clearly describe public and Aboriginal consultation, including the identification of any concerns raised during consultation with respect to traditional activities being practiced near the project site.

Subsequent to the enactment of *CEAA 2012*, the proponent received an electronic notice from the CEA Agency on August 10, 2012, informing that the CEA Agency is no longer involved in any of the waterpower projects proposed by Xeneca at the time.

All correspondence received to date from the CEA Agency is provided in Appendix C.

6.3.1.2. Fisheries and Oceans Canada

The Department's role as a RA under the *Fisheries Act* was confirmed at the February 8, 2011 EA Coordination meeting. In response to Xeneca's proposed approach to deviate from the standard EA planning process by which commitments would be made in the screening report to complete future investigations in advance of the permitting process, DFO cautioned that they were unable to comment on the appropriateness of this approach until they had completed a review of the investigations undertaken in support of the project.

DFO outlined their concerns and responsibilities regarding the project, including impacts to fisheries (noting Lake sturgeon concerns) and fish habitat around the project site and at any proposed water crossings as well as provisions for fish migration and passage and the requirement for detailed information. In order for DFO to complete their review of the undertakings, accept the EA planning outcomes, and, ultimately, make a determination under the *Fisheries Act* and *SARA*, sufficient detailed information relating to these issues must be made available.

Consultation with DFO will continue as the project moves forward into the permitting and approvals phase of development. Detailed engineering drawings will be required by the Department before it can issue a determination under the *Fisheries Act*.

DFO was in attendance at the May 26, 2011 meeting to scope the biological field program for the proposed project, during which they noted that the project represents a HADD (Harmful Alteration or Disruption, or the Destruction, of Fish Habitat). DFO added that they would defer to the MNR's fisheries management plan with regard to issues dealing with fish passage. During a

discussion of habitat compensation requirements, DFO confirmed that compensation can occur in a different location from the area that is impacted, as long as it occurs within the same system.

In July 2012, DFO issued correspondence to Xeneca to advise them that a Federal EA would not be required, due to changes to the *CEAA*.

DFO was in attendance at the July 19, 2012 meeting with Xeneca, MNR and MOE to discuss potential project impacts and proposed mitigation measures. During the meeting, the possibility of creating Lake sturgeon spawning habitat at Nairn was discussed as one option to compensate for losses at Wabageshik Rapids. Compensation measures would be discussed further with DFO and MNR during the permitting phase of development. DFO also raised concerns regarding the potential for fish mortality due to entrainment and impingement at the proposed facility, and stated that mortality numbers are required before the department can make a decision on authorizations for the project (i.e. Section 32). In regard to requirements for fish passage, it was noted that DFO first requires direction from the MNR on whether fish passage is indeed required to meet fisheries management objectives, before DFO can make a determination on whether fish passage at the dam will be required per the *Fisheries Act* (Section 20). MNR suggested at the meeting that they may be willing to accept a lack of fish passage, provided that there is adequate habitat compensation elsewhere in the same system downstream of the Wabageshik Rapids GS, and that an ecologically defensible operating plan can be agreed upon.

DFO was provided with the draft ER for the proposed Wabageshik Rapids GS on August 10, 2012. DFO issued its review comments on September 11, 2012, which focused on fish, fish habitat, and potential requirements under the *Fisheries Act*. Based on its review of the proposal, DFO noted that there may be a requirement under Section 20 of the *Fisheries Act* to provide fish passage at the Wabageshik Rapids GS, although a final determination by the MNR on the need for fish passage had not yet been made. DFO also noted that, should the construction of cofferdams and the associated dewatering result in a HADD (harmful alteration or disruption, or the destruction, of fish habitat), the affected fish habitat will need to be included in the fish habitat compensation plan.

On January 2, 2013, DFO issued a letter to Xeneca informing them that a fish habitat authorization would be required under Section 35 of the *Fisheries Act*, to address the impacts to a horseshoe-shaped area that would be dewatered during regular operations at the proposed Wabagishik Rapids site, and the impacts to the area of inundation. These impacts would result in a HADD and would require that a fish habitat compensation plan be developed. DFO advised that the compensation plan should address benthic invertebrate habitat compensation for the areas where this type of habitat was predicted to be lost. DFO also indicated that the proposed 5 m^3/s minimum flow value could be increased to minimize the impact on benthic invertebrates in the horseshoe-shaped area.

In an email dated February 21st, 2013, DFO provided further clarity on the issues that were required to be resolved to complete DFO's regulatory review. Outstanding information that still needed to be provided to DFO at this time included a Fish Habitat Compensation Plan in regards to Section 35 of the Act, a finalized Operating Plan (Section 22), fish mortality estimates and mitigation measures proposed to limit fish mortality during operation of the facility (Section 32), monitoring plans for construction, post construction and operations, Aboriginal Consultation Records, and an application for Fish Habitat Authorization.

DFO participated in inter-agency meetings and teleconferences held on February 27th, March 19th, and March 21st, 2013. DFO provided a key role in the review of the Draft Fish Compensation plan submitted by Xeneca in March of 2013. DFO participated in an additional teleconference on April 25th, 2013, where recommendations were provided on fish habitat compensation. Additional description of this meeting is provided under MNR correspondence.

6.3.1.3. Transport Canada

On September 28, 2010, TC provided comments to the CEA Agency on the draft Project Descriptions issued by the proponent. TC noted that where there is a proposal for new works including dams, booms, and water crossings, the *NWPA* will be triggered. TC advised that, to confirm its role under *CEAA*, a Request for Project Review under *NWPA* (from the proponent) should be submitted as early as possible to the Navigable Waters Protection Office. The agency could provide an opinion as to the navigability of the waterway and whether or not the *NWPA* will apply to the project. The proponent was advised to include the results of this navigability assessment in the Project Description if possible.

The Agency's role as a Responsible Authority for the project was confirmed at the February 2011 EA Coordination Meeting. The Agency advised the proponent to submit its application for a project review request under the *NWPA* as soon as possible; the application is pending. Section 5(1) of the Act prohibits the construction or placement of any "works" in, on, over, under, through or across navigable waters without first obtaining approval.

Future consultation with TC will be required as the project moves forward in the development process. Detailed engineering drawings will be required by the Agency before it can issue a determination under the *NWPA*.

6.3.1.4. Environment Canada

The results of the 2010 surface water quality investigation (Annex IV) were provided to EC on March 15, 2011. EC was also informed of the proponent's timeline for releasing additional supporting documentation, including reports that would encompass hydrology, operations, existing conditions and archaeology.

Although no comments have been received from EC on the results of the 2010 surface water quality investigation for the Wabageshik Rapids, comments were received from the Agency for other Xeneca surface water investigation programs, applying the same methodology. It is therefore anticipated in the writing of this document that the Agency would have similar comments for the Wabageshik Rapids site, generally these would include:

- Information on the reference sampling area prior to headpond creation to ensure appropriate sampling for baseline conditions is completed;
- Estimate of the expected temperature and volume of the thermal discharge from the powerhouse in order to quantify the potential change in surface water temperature in the headpond due to increased surface area and slower flow velocity;
- Additional analytical parameters in relation to hardness of water, water levels and currents, etc.

The proponent undertook consultation with EC in 2012 in order to scope and undertake additional surface water quality investigations in order to determine any potential negative effects of the proposed project within the project's zone of influence. For details on the project's proposed surface water quality program please refer to Annex IV of this report.

EC was provided with a copy of the Draft ER for the proposed Wabageshik Rapids project on August 10, 2012. EC provided its review comments to Xeneca on September 7, 2012. EC advised Xeneca on mitigation measures for impacts to migratory birds during project construction, and that the chipping of waste wood is a more suitable alternative to burning during construction.

In a September 10, 2012 response letter to EC's review comments, Xeneca acknowledged EC's comments in regard to nesting migratory birds and other avian species, and stated that woody debris will be chipped instead of burned wherever possible during construction.

6.3.1.5. Natural Resources Canada

An Agency representative from NRCan participated in the February 2011 EA Coordination meeting. NRCan indicated they would offer expert advice on hydrology and mercury at the request of the RAs.

Electronic correspondence was received from NRCan on August 13, 2012, confirming that NRCan is no longer involved in the undertaking as a result of *CEAA 2012* coming into force.

6.3.2. Provincial

Various provincial ministries were provided with a Notice of Commencement, a revised Notice of Commencement, the Project Description document and a copy of the Draft ER. A record of provincial agency consultation is provided in Appendix C.

The following is a synopsis of the consultation undertaken with provincial regulators.

6.3.2.1. Ontario Ministry of Natural Resources

The MNR, with a mandate to manage natural resources and to promote renewable energy in the province, has a legislative role in this project with respect to natural heritage, water management planning, and the management of Crown land.

Meetings were held between members of the EA team and the MNR to refine field study work plans and investigation protocols, and confirm reporting requirements. Discussions toward reaching consensus were initiated and will continue beyond the report submission stage.

The proponent's notification and consultation with the Ministry includes the provision of early notification of the project, requests for background/baseline information on natural heritage information and data in the vicinity of the project site, scoping consultation, and application for scientific permits and approvals to complete natural habitat and geotechnical investigations.

Discussions were held between the EA project team to discuss potential impacts resulting from the proposed development as it relates to Lake sturgeon and other species at risk.

Sudbury District Office MNR met with members of the EA project team on September 17, 2010 in order to determine the applicability of the *ESA* to the project. One species at risk, Lake sturgeon, has been observed at Espanola and the Nairn Dam site. The Ministry stated there were no natural barriers to fish movement to Wabageshik Rapids and that site investigations confirmed suitable Lake sturgeon habitat at the rapids. MNR informed the EA team that field investigations would have to extend beyond 2 years to verify that Lake sturgeon were not using the habitat at the base of the rapids. The Ministry also noted the abundance of wetland habitat in proximity to the site that was favoured by Blanding's turtle, noting that the wetland would be a key factor in determining the connection line route. For a detailed record of the meeting, the reader is directed to the meeting minutes in Appendix C.

The Ministry contacted the EA project team in December 2010 to advise of increased anecdotal evidence of Lake sturgeon in the vicinity of the project site. The proponent subsequently provided MNR with a proposed multi-year telemetry program for Lake sturgeon investigations to increase the data on the distribution and habitat use of Lake sturgeon on the Vermilion River

in the vicinity of Wabageshik Rapids. (Note: following further field studies, the proposal for a multi-year telemetry program was later deemed unnecessary. The currently-proposed monitoring plan involves the use of Riverine Index Netting, as described in the Preliminary Biological Monitoring Plan in Annex III of this ER.)

MNR requested information from the proponent in January 2011 regarding public consultation events. MNR was kept informed of all subsequent public consultation opportunities.

A Site Information Package for the Wabageshik Rapids project was provided to the proponent by the Ministry on February 23, 2011.

MNR participated in the February 8, 2011 EA coordination meeting, a brief summary of the main topics discussed is presented below, detailed meeting minutes are included in Appendix C.

- The MNR confirmed that the exemption of connection lines rated at <115 kV from the Waterpower Class EA necessitated the application of the RSFDP Class EA to those portions of the connection line crossing Crown land. It was agreed that the environmental assessment of the project under the Waterpower Class EA would be expanded to incorporate the assessment of the connection line, meeting the notification requirements of both processes and that the EA would remain a proponent driven process. The Ministry requested connection line and access road mapping in order to categorize the undertaking under the RSFDP Class EA, and requested the completion of an MNR Part 1 Work Permit from Xeneca. (Note: it was later decided to keep the two EA planning processes separate, and therefore information on connection lines is provided in this EA is for information purposes only, and should not be considered within the scope of this EA.)
- The Ministry cautioned that Xeneca's proposed approach to making commitments in the ER to 'fill in' information gaps at the regulatory permitting stage of development would likely result in the inability of MNR to issue Location Approval.
- Key permitting requirements were discussed, including *LRIA* and *ESA*, the *Public Lands Act*, the *Aggregates Act* and the *Crown Forest Sustainability Act*.
- The Ministry confirmed it would provide further guidance on specific information requirements with respect to passage for Lake sturgeon.

The MNR requested to be included in the planning of Xeneca's Aboriginal consultation initiative in March 2011.

The MNR received copies of all correspondences sent to Aboriginal communities, including copies of the Draft Aboriginal Consultation Plans. On April 26, 2011, the MNR provided

notification letters to all communities regarding the Non-competitive waterpower site release application process for waterpower projects.

MNR was in attendance at the May 26, 2011 agency meeting with Xeneca to scope the biological field program. MNR confirmed at the meeting that, should Lake sturgeon be confirmed to be present in the project area, permitting requirements under the *ESA* will need to be met.

During 2011 and 2012, Xeneca and senior management personnel from the MNR, the MOE and, to a limited extent, DFO, engaged in a series of meetings to determine a reasonable and efficient approach to engaging the review agencies at the regional and district levels. It was hoped that consistency in requirements and review across agency districts could be achieved, such that provincial environmental planning requirements for the Class EA process are met within reasonable timeframes, thereby assisting Xeneca in meeting their FIT contract schedule. In 2012, meetings were held on February 8, March 13, April 16, May 4, June 8 and July 19.

During the July 19, 2012 meeting with Xeneca, DFO, MNR and MOE, the MNR expressed concern over the lack of information at the time regarding SAR habitat, such as Blanding's turtle and Eastern Whip-poor-will. MNR noted that the permitting process, when SAR are involved, may take up to 6 months or longer, and therefore impacts and mitigation should be investigated now in order to limit delays later on. [*Note: biological field investigations along the proposed access road corridors, including targeted surveys for Blanding's turtle and Eastern Whip-poor-will, were conducted in 2013, and are summarized in Section 2.9 of this report. The full reports detailing these field investigations are included in Annex III.*] The MNR recommended that Xeneca fill out a "Hydrologic Regime Assessment Table" with information produced by the computer software SAAS (Streamflow Analysis and Assessment Software), in order to inform discussions on the proposed degree of system alteration and to determine suitable environmental flow requirements. Following this meeting, Xeneca completed the table and provided it to the MNR on October 12, 2012 (see Annex I of this ER for a copy of this table).

MNR was provided with the Draft ER for the Wabageshik Rapids project on August 10, 2012. MNR issued its review comments to Xeneca on September 28, 2012. The MNR's comments focused predominantly on:

- The lack of consensus with regulatory agencies over the anticipated Zone of Influence;
- Additional information requirements in support of future authorizations for the project under the *Lakes and Rivers Improvement Act*;
- Consultation requirements for water management planning;
- Aboriginal consultation process and the Crown's Duty to Consult;
- Potential requirements for authorizations under the *ESA*;

- Information and studies required ahead of MNR issuing permits for the construction of roads and transmission lines;
- The scope of studies undertaken for assessing potential impacts to terrestrial wildlife species and habitat; and
- MNR's recommendation that a post-construction monitoring plan be integrated with the proposed development.

In its review comments, the MNR also noted that, should Xeneca complete the EA process without fully addressing the MNR's comments, the additional information and the associated review would be required prior to the consideration of permits and approvals. The MNR's complete review comments are included in Appendix C of this ER.

On November 6, 2012, a meeting was held between Xeneca, MNR, DFO and the Ontario Federation of Anglers and Hunters to discuss habitat compensation for the proposed project. During the meeting, it was acknowledged that some spawning habitat would be lost during construction, but that Xeneca commits to replacing the lost habitat. It was suggested that a partnership could be developed between Xeneca and Vale, who is working on habitat compensation for its facilities on the Vermilion and Spanish Rivers. The MNR and DFO agreed that there is no problem with such a partnership, but there would need to be an agreement in place between the two companies regarding the types of work to be applied and the division of labor. Potential sites for habitat compensation included a site just below Vale's Nairn Centre dam (which would require a partnership and/or agreement with Vale), the embayment area immediately downstream of Wabageshik Rapids, and Graveyard Rapids (approximately 4 km downstream of Wabageshik Rapids).

In 2013, meetings were held on January 21st, February 27 and 28, March 12 and March 19 (via teleconference), and March 21. On January 21, 2013 NRSI and Xeneca representatives had a discussion with MNR to finalize issues related to the deer crossing. Xeneca (NRSI) conducted a study to combine flow and deer crossing data. The results of the study showed that deer have no problem crossing the river at flows of between 50 and 60 m^3/s, therefore no changes to the proposed Operating Plan were required as a result of deer crossing. Daily flows are provided by Vale, and the proposed Wabagishik Rapids facility will produce hourly data. Xeneca committed to assembling flow data for the remaining eight months of the year and adding it to the Operations plan. They also committed to outlining a monitoring strategy for deer migration along with potential mitigation strategies that could be employed if future limitations or issues related to deer crossing are identified.

On February 27th and 28th 2013, an issues scoping meeting was held in Sudbury. Xeneca provided MNR with an update on the development of Draft agreements with Vale (Sudbury) and Domtar (Espanola), as they related to the water management planning process for the

Spanish-Vermilion River system and the cumulative impacts of the Wabagishik facility. The finalized operations plan was discussed with respect to minimum flows required at the Domtar facility. Aggregate resource requirements were discussed; Xeneca plans to utilize local pits to supply the aggregate required for the project and will not open their own pit. A tender for these services will be offered during the construction phase. The requirement for geotechnical investigations to investigate ARD (Acid Rock Drainage) was discussed. The Construction Management Plan (Annex II of this ER) references how ARD will be appropriately addressed. Erosion potential and monitoring were discussed; although the issues associated with erosion and sedimentation seems limited, they were further addressed through development of the geomorphology report, which can be referenced in Annex I of this ER.

The requirement for additional public consultation was raised by the MNR. To date, Xeneca has held three public meetings on the project, has developed a stakeholder advisory committee and identified potential partnerships with organizations such as Earthcare Sudbury, Science North, Laurentian University and the Sudbury Chamber of Commerce. Additional studies that were not included in the public consultation events to date will be provided for public scrutiny through placement on the company website, and through direct notification.

Significant wildlife habitat, specifically relating to the deer migration corridor and amphibian breeding was discussed. MNR indicated that recent sightings of deer utilizing an area north and east of Elizabeth Lake may require Xeneca to avoid certain stands and minimize the strip width required for roads to access the site, however the cumulative impacts would be better established through regular monitoring.

Fish habitat compensation was discussed, specifically that required for walleye and Lake sturgeon spawning habitats. Two sites were selected in the Vermilion River for compensation; these include the Graveyard Rapids and an area directly below Wabagishik Rapids. Detailed discussion took place considering the optimal timing of flows and water temperatures to sustain spawning activities and larval drift in the compensation areas. MNR identified the need for fish mortality estimates during monitoring and habitat authorizations.

Minimum flow requirements to sustain the flows were discussed in detail. Xeneca stated they had a limited ability to control the ramping rate. The method of passing the minimum flows was also discussed as it was planned to be proportioned, both over (or through) the dam or through the facility. The requirement to minimize water fluctuations at the Domtar Dam was discussed, in addition to the operational activities of Vale at the upstream Lorne Falls Dam. At the end of the meeting, Xeneca committed to assessing the potential for combining the road and power line corridor along Xeneca's preferred north/south road leading to Panache Lake Road. Xeneca also proposed to add spawning habitat timelines into the ER with a discussion on the temperature-

based approach to operations during the spawning period, and to seek further clarification from Woodland Heritage Services and MTCS on the buffer zone for the Belmer archaeological site.

On March 12, 2013, Xeneca provided MNR with additional information on flow fluctuations downstream of the Domtar Dam at Espanola in order to address concerns about the cumulative effects of the Wabageshik Rapids project. This letter provided MNR with an analysis showing that fluctuations resulting from the proposed Wabageshik Rapids project would not significantly increase the fluctuations downstream of Domtar under existing conditions.

On March 19, 2013, a teleconference was held as a prelude to the upcoming March 21 issues consensus meeting. The operation plan, minimum flows, *ESA* requirements, and the deer crossing were topics of discussion. MNR informed Xeneca that additional time would be required for proper regulatory review of all submitted material.

On March 21, an issues consensus Meeting was held in Sudbury. At this time, the proposed Operating Plan had been modified to reflect the minimum flow requirements proposed during the February meeting. Discrepancies in the data were discussed and the need for more detailed reviews by MNR and MOE staff were identified.

The preliminary Fish Habitat Compensation Plan was introduced. This plan focuses on walleye and Lake Sturgeon spawning requirements at two riffles upstream of Wabagishik Rapids (one upstream of the snowmobile bridge and one downstream) and in the Lower Vermilion and Spanish Rivers. Fish in Wabagishik Lake utilize spawning habitats at Lorne Falls and at other locations on the lake. Therefore the focus of the compensation agreement is on fish spawning downstream of the proposed Wabagishik Rapids facility. Changes to the proposed compensation area were discussed; approximately 50% of this area was removed from the compensation plan due to high flow values being overestimated for the site. The two proposed compensation locations, Graveyard Rapids and the bottom of Wabagishik Rapids, were discussed with respect to the need to maintain navigation and spawning. Some residual spawning habitat will remain in the inundation area.

The Monitoring Plan was introduced and specific measures were identified for deer crossing, turtle overwintering habitat, vegetation monitoring in the bay directly below Wabagishik Rapids, and wildlife. Benthic invertebrate monitoring and fish community sampling, in addition to monitoring of the fish compensation measures implemented, comprise the aquatic habitat monitoring requirements. MNR identified that additional monitoring measures would be required for downstream erosion and possibly for Lake sturgeon. Further discussion ensued regarding the requirement for flowing water between the tailrace and pool and commitment was made to conduct monitoring that includes flow measurements and water quality. Compensation spillway flows and the mechanisms for passing these flows were discussed.

Discussion took place regarding the March 12, 2013 submission from Xeneca. Due to the level of uncertainty in the model, further discussion will be required with Domtar to clarify their concern regarding low flows, and to determine whether the pulsing from Vale may require them to spill additional water which would result in a loss of generation capacity. It was identified that MNR assistance might be required to actively engage Domtar and Vale Inco in further discussions on water management planning requirements. The operational limits of Domtar and the timing and intensity of flows from Nairn Centre would need to be studied further. The agreement between Domtar and Xeneca should ensure that pulses of water will not combine and force Domtar to change its downstream flow or lead to a loss of generating revenue at its Espanola GS. At this meeting Xeneca expressed concern regarding requests for a routing study. It was agreed that MNR would make a request to Vale for the required data. MNR stated that, for *LRIA* approval, other operators on the river system would need to be engaged and agreements would need to be in place.

Xeneca advised MNR that KBM and Dave Thompson (Dowland) had been retained to complete the required habitat assessments for the majority of the roads and transmission line work. Progress on the proposed road and transmission line locations for project development was facilitated through a two-stage habitat assessment, which included spring sampling in late April/early May of 2013 through Ecological Land Classification (ELC) classification of a 500 m wide corridor. Activities planned included examination and documentation of landforms, vegetation, ecozones and potential habitat for species at risk. The second round of habitat assessment would focus on transmission lines. A request was made to MNR to share values information and survey methodology for selected species at risk. Xeneca confirmed that the proposed road and transmission line corridor would follow one shared route, but that the initially proposed options would remain in the EA documentation. Any new information resulting from the roads studies would be provided to the public through newsletters or through the Xeneca website. Meeting minutes for all inter-agency meetings are provided in Appendix C.

On April 25, 2013, a final conference call took place with MNR and DFO to discuss the fish habitat compensation plan. MNR and DFO indicated they would like to see additional detail added to the compensation plan to further quantify the HADD, and utilize available modelling information to better delineate suitable habitat and flow regimes. In addition a clearer indication of the amount of habitat lost for each species should be prepared to facilitate further discussions regarding ratios of replacement habitat required for Lake sturgeon and Walleye.

The agencies proposed that potential options for compensation should focus on the embayment and tailrace areas rather than the Graveyard Rapids location and the plan should indicate a prioritization of potential sites, and where productivity can be enhanced and quantified in existing productive areas.

DFO and MNR recommended additional 2D modelling after the EA is completed. The timing of development of compensatory habitat and the implications for compensation ratios was discussed. The method of placement of compensatory habitat materials was discussed with regard to the need to protect the archaeological (Belmer) site on the North side of the river. The alignment of the plunge pool feature in relation to the tailrace was discussed. Regulatory agencies suggested that the compensation plan should be augmented with additional information on benthic invertebrate feeding habitat and food production areas and the benefits of the compensatory habitat to benthics.

Monitoring methods for compensatory habitats were discussed with a focus on larval drift and egg matting and fish mortality monitoring. 2-D modelling on priority sites was recommended by regulatory agencies at sites such as the tailrace and the upstream limits of the embayment.

The requirement for Xeneca to obtain a letter of credit to cover the cost of creating compensatory habitat was discussed.

In June 2013, the project team and MNR discussed the potential power line options for the proposed Wabageshik Rapids GS. It was determined that Xeneca would only present power line options that were in conjunction with road corridors. The resulting corridor options can be found in Section 3.4 above.

In their review comments on the proposed Operating Plan (comments sent in draft form in mid-June, 2013), the MNR (Sudbury district) stated that they accept the downstream operating parameters as presented. These parameters include the minimum flows during intermittent operations, the minimum compensatory flow in the spillway area, and the maximum turbine flow during continuous and intermittent operations (see Section 5.6 above and the proposed Operating Plan in Annex I of this ER).

Throughout June 2013, the MNR provided their review comments on various draft documents submitted by Xeneca, these being:

- The Fish Habitat Compensation Plan (see Annex III of this ER for the final version)
- The Operating Plan (see Annex I)
- The Power Lines & Roads Summary report (see Annex VI)
- The Construction Management Plan (see Annex II)
- The Biological Monitoring Plan (see Annex III)

Xeneca issued responses to the MNR's review comments in late June 2013 and early July 2013 (see Appendix C of this ER for the response letters). The above listed documents were revised

based on the MNR's feedback, and the revised versions are included in Annexes I, II, III and VI of this ER.

6.3.2.2. Ontario Ministry of the Environment

A project overview and draft Notice of Commencement was provided to the MOE on June 10, 2010.

At the February 2011 EA Coordination meeting, the MOE cautioned that Xeneca's approach to making commitments in the ER to fill in information gaps to satisfy regulatory permitting requirements may lead to a requirement for an addendum to the EA to address any major changes to the undertaking (components or activities) that may cause a new negative effect from the subsequent identification of unforeseen impacts. MOE noted that any impacts that would be dealt with at the permitting and approvals stage must be identified in the ER in order to meet the intent of the Class EA. The addendum EA document would need to be finalised prior to permits being issued which could lead to delays later in the process. MOE also cautioned the proponent to remember the intent of the EA process and ensure that it is satisfied.

The Ministry outlined a list of information and permitting requirements which should be addressed in the ER document. The MOE noted that the limited field work completed to date could not have adequately addressed the important sport fishery in the project area. The project biologist confirmed that spatial and temporal assessments would be completed in the upcoming 2012 field season (see Annex III). The Ministry noted the requirement to address any potential for ARD impacts to surface and ground water quality through completion of a field reconnaissance by a qualified professional to assess the risk of ARD due to the presence of sulphide minerals, and submission of a stamped report stating the opinion on and risk of encountering ARD rock, recommendations for any further testing required, and recommendations for handling any rock identified as having ARD potential ranging from medium to high. A surface water quality program has since been established in consultation with the MOE (see Annex IV). MOE advised that it wanted to be included in any discussions/meetings on establishing minimum flows. The MOE was involved in the 2011/12 discussions between Xeneca and key regulators as was discussed in the previous section. The MOE participated in the July 19, 2012 agency meeting which was the first in a series of meetings to discuss minimum flow requirements for the project (see Appendix C). The Ministry added that all further notices should indicate all of the EA planning processes being incorporated into the assessment of the project. The Ministry stated that, based on the public and stakeholder feedback received to date, Xeneca was encouraged to give thought to the quality of information presented at its Public Information Centres. The MOE noted being in receipt of communication from the Vermilion River Stewardship Committee expressing its concerns over the proposed project. Meeting minutes are provided in Appendix C.

The MOE was provided with a copy of the Draft ER for the proposed Wabageshik Rapids GS on August 10, 2012. The MOE issued its review comments on September 24, 2012. The MOE commented on a number of issues including, but not limited to:

- Requirements under the Class EA for Waterpower Projects for Public and Aboriginal consultation;
- Xeneca's proposed timing for additional field investigations and consultation relative to the issuance of the Final ER and Notice of Completion;
- Potential impacts on operations at the neighbouring dams and waterpower facilities (owned by Vale and Domtar);
- Potential impacts on water quality;
- The total zone of influence;
- The archaeological assessments;
- Potential cumulative impacts.

The MOE further noted that extensive additional work was required for the Final ER. The complete review comments from the MOE are included in Appendix C of this ER.

The MOE participated in an inter-agency meeting held on February 27th and 28th, 2013, where minimum flow requirements were discussed further. The proposed minimum flows in the Final Operations Plan were determined based on discussion between MNR, MOE and the proponent.

At this meeting, Xeneca committed that agreements would be struck with upstream and downstream operators Domtar and Vale. Xeneca stated it would outline the procedures for dealing with acid rock and provide them to MOE for review, along with a copy of the construction management plan. Xeneca committed to provide a summary of changes to its Operating Plan in a cover letter sent out to regulatory agencies, and committed to no intermittent operations when flows were above 19 m^3/s. The requirement for the passing of minimum flows was discussed and Xeneca committed to developing a clear approach to pass the minimum flows either over the spillway or through the turbines.

MOE was in attendance at a March 21, 2013 meeting with Xeneca, MNR, DFO, and MTCS. During the meeting, MOE emphasized that an agreement with Domtar is a critical component of the minimum flow proposal for the Wabageshik Rapids GS, and that this agreement must include the specific parameters that would trigger a shift in operations at the GS from intermittent to run-of-river. Additionally, an agreement with Domtar will be required when Xeneca applies for a Permit to Take Water.

On April 3, 2013, Xeneca held a teleconference call with the MOE and a representative of the OWA in order to clarify the natural heritage and archaeological assessment requirements for road

corridors for all projects under the Waterpower Class EA. During this meeting, different approaches to the assessment process were discussed.

On July 18, 2013, the MOE provided Xeneca with their review comments on the March 2013 drafts of the Construction Management Plan and Operating Plan. The MOE provided a brief explanation of the requirements under the *Environmental Protection Act* with regard to waste disposal during construction. The MOE also advised that additional clarification be provided in the Construction Management Plan regarding the potential risk of Acid Rock Drainage during blasting activities.

With regard to the March 2013 draft Operating Plan, the MOE requested clarification on various operating constraints and commitments proposed by Xeneca. The MOE also noted potential water quality issues at the Domtar dam on the Spanish River, and the need for sufficient dissolved oxygen levels in the Spanish River downstream of Domtar's effluent discharge location. The MOE noted that they do not object to Xeneca's proposed minimum flow of 5 m^3/s during intermittent operations, on the condition that an agreement is established between Xeneca and Domtar in which the Wabageshik Rapids GS will switch to run-of-river operations when needed. The MOE further noted that when a Permit to Take Water is ultimately issued to Xeneca for their waterpower generation, it will require that the agreement made with Domtar be executed, and that dissolved oxygen levels below the Wabageshik Rapids GS be monitored. Should no formal agreement between Xeneca and Domtar be achieved, the MOE will instead require a minimum flow of 6.5 m^3/s be released at all times below the Wabageshik Rapids GS.

The MOE's July 18, 2013 comments on the draft Construction Management Plan and draft Operating Plan were discussed in a teleconference call on August 7, 2013. Xeneca confirmed that the Construction Management Plan will be revised based on the MOE's feedback *[NOTE: the Construction Management Plan (August 2013) in Annex II of this ER includes the revisions requested by the MOE]*. During the call, Xeneca explained the proposed operating constraints for mitigating potential impacts to the headpond of the Domtar dam on the Spanish River. In the event that the water level in the Domtar dam's headpond reaches the limits of its operating band, the Wabageshik Rapids GS will revert to run-of-river operations if it is not already operating as such. Xeneca noted that they will strive to attain a finalized MOU with Domtar prior to applying for a Permit to Take Water. Xeneca confirmed that, in the event that an agreement cannot be achieved, a minimum environmental flow of at least 6.5 m^3/s will be released at all times.

6.3.2.3. Ontario Ministry for Municipal Affairs and Housing

In response to the request for comments on the proposed project, the Ontario Ministry for Municipal Affairs and Housing advised the proponent on July 20, 2010 (Appendix C) that their

Ministry did not intend to comment specifically on any of the projects proposed by Xeneca as it was understood that consultation efforts with potentially affected communities was being undertaken by the proponent.

6.3.2.4. Ontario Ministry of Energy

The ME requested additional information on Xeneca's proposed approach to fostering Aboriginal and First Nation partnerships within the development proposal via an e-mail on December 21, 2010 (Appendix C). ME noted that although the Ministry might not participate in all planning meetings, the Ministry would like to be kept abreast of the planning process developments. Additionally, ME confirmed on January 5, 2011 (Appendix C) that they wanted to be included in the distribution of all technical documents and the ER in order to provide comment where appropriate.

A representative from the Ministry was present at the EA Coordination meeting; no concerns were raised by the Ministry.

6.3.2.5. Ontario Ministry of Transportation

The MTO provided a response to several of Xeneca's proposed undertakings on February 18th, 2011. Information was provided as per the *Public Transportation and Highway Improvement Act* and applicable permits (Appendix C). MTO identified the requirements for any project that requires modification to a highway entrance. The Ministry identified that all connection lines must be placed outside of existing MTO ROW, and that permits will be required for all proposed ROW crossings or for lines located within 45 metres of MTO ROW limits.

6.3.2.6. Ontario Ministry of Tourism, Culture and Sport

Representatives from the MTCS Heritage and Marine departments participated in the EA Coordination meeting. The MTCS Marine Advisor noted a requirement for the completion of marine heritage archaeological assessment at Xeneca's proposed project sites (it was later determined that this type of archaeological assessment was not required for waterpower projects located on inland waterways in the Province). It was agreed that this would require additional discussion between the proponent, the archaeological consulting firm tasked with archaeological assessment of all Xeneca sites, and the Ministry. Stage 1 and Stage 2 archaeological assessments were conducted for the project area. Confirmation that these studies were accepted by the MTCS can be found in a letter dated Jan 31st, 2013 in Annex V. Available results of these studies can be found in Annex V.

In a communication dated February 2013 from MOE to Xeneca, MOE provided clarification related to archaeological assessment requirements under the Waterpower Class EA. This

communique outlined that because archaeological sites were identified outside of the defined zone of influence for the project, the potential impacts could be mitigated through avoidance and utilization of a buffer area. The buffer area would be 20 metres, with no portion of the buffer encroaching into the zone of influence, with an additional 50 m buffer zone for monitoring by a licenced archaeologist, which can extend into the defined Zone of Influence.

Xeneca committed to documentation of this in the EA. At a teleconference on March 21, 2013, the potential impacts of the construction of the proposed Wabageshik Rapids facility on the Belmer site was discussed with representatives of Woodland Heritage Services and the MTCS. An archaeological protocol for construction has been developed by Woodland Heritage Services, which also proposes monitoring of the site during construction. This protocol and a map with the positive test pit locations were provided to the MTCS.

On May 17, 2013, Xeneca sent a letter regarding monitoring commitments to the MTCS. The letter clarified commitments made in the March 21st teleconference, which were to describe the archaeological protocols required in a letter, to utilize contour maps to denote construction areas and location of archaeological test pits, and to forward a monitoring plan for archaeology during construction to the Ministry. The letter outlined the Monitoring Plan in some detail. The monitoring program entails a site visit to erect fencing around the site, placement of appropriate signage, and creation of documentation that will instruct staff, subconsultants and construction crews of appropriate measures to be taken during the construction phase to protect the site.

A briefing on the cultural heritage protocol will also be provided to key staff in the event of unexpected discovery of cultural resources or human remains. Site visits will be completed by Woodland Heritage staff at key intervals during the construction phase, with written reports being submitted to Xeneca on a regular basis. In the event that cultural heritage resources of any kind are uncovered during construction activities, specific protocols will be followed. Mapping of test pits and contour lines in the area were provided to the MTCS.

6.3.2.7. Ontario Ministry of Northern Development and Mines

In correspondence dated July 8, 2010, the MNDM provided a response to the review of Xeneca's project proposals. MNDM detailed the status of land tenure and mining-related hazards at the dam sites, whether past mineral exploration activity has been reported in the vicinity of the sites, and conditions in regards to various policies and acts. MNDM indicated that a similar review will be required for the connection corridors for all Xeneca's proposed hydroelectric projects.

Further, changes to the *Mining Act* in Ontario now recognizes waterpower and other resource development and provision exists for the claim holder to cede first right of refusal on surface

rights to the developer of a renewable energy facility (note excerpts from the *Mining Act* and the attached letter from MNDM stating terms of the *Mining Act* as it applies to renewable energy development; Appendix C). To properly close this file, the mining claim holder must sign off on surface rights. Xeneca will submit a request to the claim holder for an agreement for signature that will acknowledge the project and the terms under which Xeneca will develop the site.

6.3.3. Municipal

The project site was initially believed by the proponent and the City of Sudbury to be located within the City of Greater Sudbury, and, as such, the City was provided copies of the introductory letter and a Notice of Commencement for the proposed undertaking on July 28th, 2010. A Project Description document was provided to the City on November 19th, 2010. A revised Notice of Commencement was issued on November 10th, 2010. Xeneca met with municipal representatives on September 23, 2010. The recreational value of the Wabageshik Rapids was discussed. The City also expressed an interest in reviewing Xeneca's proposed operating regime for the hydroelectric development for comparison to the operating regimes of existing water control structures on the waterway. The City offered to share its available data (i.e. flood mapping, bathymetry) with Xeneca.

A representative from the municipality was in attendance at the February 2011 EA Coordination meeting. The City's representative stated that because the proponent's environmental assessment approach appeared to differ from that which is detailed in the Waterpower Class EA, that Xeneca clarify its approach to members of the public and other stakeholder groups in order to avoid misunderstandings and ensure a productive consultation initiative. The City agreed with the advice to give consideration to improving the quality of the information Xeneca was providing, and to ensure the flow of accurate information between the parties.

The Municipality of Killarney was also invited to the EA coordination meeting, but no representative was able to attend.

The proponent received an electronic communication from the City of Greater Sudbury on February 10, 2011 informing the proponent that it had revised its initial assessment with regards to municipal boundaries at Wabageshik Rapids, confirming the site was situated beyond the City's boundary. The City stated it no longer needed to be involved in the project but confirmed the Nickel Belt Conservation Authority jurisdiction and continued involvement.

It was subsequently confirmed that the Wabageshik Rapids project zone of influence is not located within the Greater City of Sudbury.

In a March 7, 2011 electronic response to the Town of Espanola regarding the project's effects on the town, the proponent stated that, in addition to the benefits of locally produced electricity,

the project would bring significant investment to the region, and much of the goods and services associated with construction will be procured locally. The Mayor and a staff member of the Town of Espanola attended the PIC. Although offered by Xeneca, no further meetings have been requested by the Town of Espanola.

On June 5, 2012, the Township of Nairn and Hyman forwarded the Council's recently adopted resolution to Xeneca, outlining their opposition to the project and their concerns about the potential negative impacts on a variety of natural resource values. Their concerns included:

- The potential impacts associated with holding back water for up to 24 hours;
- The cumulative impacts of operation coupled with the wastewater treatment facilities and heavy metal contamination from mining in the watershed;
- The potential cumulative impact of these activities on algal bloom formation;
- Concern over ice stability;
- Impacts on recreational activities, and the resulting economic impacts on tourism in the area;
- Potential impacts on Walleye and Lake sturgeon;
- Potential impacts that a lack of decommissioning plans could have on the tax base.

On September 17, 2012, Xeneca gave a presentation at a council meeting in the Township in order to address the concerns of the Township and work towards the modification or retraction of the June 5, 2012 council resolution.

On June 11, 2012, the Township of Sables-Spanish Rivers adopted a similar resolution, supporting the position of the Township of Nairn and Hyman, and opposing the project on the grounds of potential impacts to water quantity, water quality, destruction of fish habitat and spawning areas, . On November 28, 2012, Xeneca delivered a presentation to the Mayor and Council in order to address the Township's concerns surrounding the Wabageshik Rapids GS project. While the Mayor and Council were appreciative of the new information they were provided, they stated that they could not commit to rescinding the June 11, 2012 resolution. On December 13, 2012, the Township of Sables-Spanish Rivers confirmed to Xeneca that the Council did not alter their position on the resolution.

Xeneca's future intentions are to keep all municipalities informed of the project, to provide additional information where requested to do so, and to continue to engage on an ongoing basis with all municipalities. Xeneca will respond to all future meeting invitations.

6.4. PUBLIC CONSULTATION

Public consultation was undertaken by the proponent in the form of direct communications, advertising, PICs and other correspondence. Each PIC was advertised in local publications at least ten days prior to the event; copies of the advertising undertaken in support of the PICs, as well as a record of consultation compiled by the proponent, are provided in Appendix D. Private information of specific individuals (e.g. phone numbers and home addresses) was redacted from the correspondences for privacy reasons.

A summary of the identified issues and concerns raised during the public consultation process is summarized in the sections below and included in Table 33.

General consultation events

Members of the public, including local residents, cottage owners, and hunters and trappers, were added to the public mailing list and sent project information from Xeneca upon request. Throughout the EA planning process, the proponent received inquiries/concerns regarding:

- The road network to be used during construction
- Location of transmission line
- Gross revenue charges
- Water quality
- Ice buildup on Wabagishik Lake
- Potential for impacts due to heavy metals
- Potential impact on elk restoration locally
- Potential for algal blooms
- Potential for effects on loons and turtles
- Rail line crossing (one access alternative)
- Impacts on remoteness of the area
- Potential for private property damage
- Access to the river
- Fluctuations in water levels
- Safety to recreational users in the waterway
- Effects on canoeists (safety, portage routes, loss of rapids for paddling)
- Effects on property values
- Aesthetic and noise impacts
- Effects on the snowmobile bridge
- Effects on fish spawning habitat
- Fish passage requirements

- Connection line routes relative to private property

An email was received on December 20, 2010 from a licenced trapper within the project area, requesting to be added to the project's mailing list and to be informed of project updates.

One individual contacted the proponent in March and April 2011, voicing his support for the proposed development, and suggesting that the dam be used to regulate water levels on Wabagishik Lake in the spring and summer, as this would benefit cottage owners.

On July 19, 2012, an email was sent out to the stakeholder mailing list, confirming that Wabagishik Lake is within the Zone of Influence for the proposed project. The recipients of the email were informed that the headpond of the Wabageshik Rapids GS could extend into the lake, and, though the project will generally follow natural lake levels, fluctuations of ± 5 cm in the lake level could occur.

On the advice of the MOE, Xeneca made the Draft ER for its projects, including the Wabageshik Rapids GS project, publicly available on its website in early July 2013. The public contacts were notified via email of the availability of the Draft ER.

6.4.1. Public Information Centres

March 22, 2011 Public Information Centre

Individuals on the project mailing list were emailed invitations to attend the March 22, 2011, PIC on March 15, 2011. Published advertising for the PIC appeared in the Sudbury Star on March 9 and 12, 2011 and the Mid North Monitor on March 9 and 16, 2011.

The March 22, 2011 PIC was held at the Espanola Recreation Centre from 4:00 – 8:00 pm. At the time of the PIC, the Wabageshik Rapids GS was proposed at a location approximately 300 m downstream from the current preferred location, and incorporated both a weir and penstock in its design.

Approximately fifty (50) people were in attendance at the PIC, including members of the OFAH and the RCSA. One of the provincial directors of the OFAH expressed concern over impacts to Walleye spawning grounds, but was interested in the proponent's potential contributions to the local fish hatchery programs. Although several individuals voiced concerns about the project's potential effects on water levels in Wabagishik Lake and the Vermilion River downstream of the proposed dam, some lakefront property owners viewed the potential changes positively, noting that water levels on the lake presently experience seasonal fluctuation of up to 6 inches per day. The landowners suggested the dam could act to regulate lake levels, particularly in May and June. Other landowners were concerned about the proposed connection line and access routes

passing through their property. One couple expressed opposition to the project, claiming that their property will be negatively affected. The snowmobile bridge located upstream of the project site was also mentioned during the PIC. The proponent stated that they will not be crossing the bridge with any equipment, but the footings of the bridge may be exposed to some inundation.

There were discussions between PIC attendees and project team members concerning wildlife in the area, with attendees noting that deer and moose cross a low-water part of the river just above the proposed dam location, and that this is a critical linkage between their summer grounds and over-wintering habitat to the east. It was noted that bald eagles and a beaver house have been sighted in the proposed project area. Other concerns raised during the PIC include:

- Effects on turtles, fish, loons and waterfowl
- Impacts on aesthetics and recreation (fishing, camping, navigation)
- Public safety for those travelling on the lake during winter
- Public access to the general area
- Water quality (e.g. sedimentation, especially of heavy metals, in the river; turbidity levels during mid-summer dry spells)
- Fish migration (changes to flows, presence of impassable barriers)
- Extent of inundation
- Resulting turbidity levels downstream of dam
- Effects to water quality from metals in sediment
- Effects on angling

Following the PIC, some riparian landowners emailed additional questions and concerns to the proponent, including concerns regarding proposed access to the site, construction noise impacts, property value impacts, aesthetic impacts, and public safety. A request was made by some property owners for a face to face meeting with the proponent.

<u>October 20, 2011 Public Information Centre</u>

Subsequent to the March 2011 PIC, the proposed location of the Wabageshik Rapids GS was shifted approximately 300 m upstream in order to:

- Avoid a sensitive spawning area; and
- Address local landowner concerns over visual and noise impacts.

A second PIC was held on October 20, 2011, at the Espanola Recreation Centre, in order to present the revised site location and the proposed close-coupled design. Updates on the results of field investigations were also presented.

At least forty (40) individuals were in attendance at the PIC. A questionnaire was also distributed to the attendees, inquiring about their use of the Vermilion River in the general project area and their opinion of the proposed project. A wide range of recreational uses were reported, including, but not limited to, fishing, camping, trapping, cottaging and snowmobiling. The most frequently cited concern was that water levels in Wabagishik Lake and local aquatic and terrestrial wildlife would be impacted. Xeneca responded to concerns raised, including impacts in Wabageshik Lake levels, and that lake levels would follow natural lake levels throughout seasonal changes within a ± 5 cm range.

July 25, 2012 Public Information Centre

Representatives of various provincial regulatory agencies attended the July 25, 2012 PIC, which was held at the Espanola Recreation Centre. In total, about 35 people attended.

A broad spectrum of questions were asked in relation to the project and how it will be developed and operated. Some of the topics included:

- Decommissioning of the site
- Environmental effects
- Water level fluctuations on Wabagishik Lake
- Effects on Vale Inc. upstream waterpower project at Lorne Falls
- Effects on downstream users (Domtar) at Espanola
- Impact on fisheries
- Vermilion River Stakeholders Committee
- Potential impacts of global warming

The Mayor of Nairn Centre attended the meeting and acknowledged recent correspondence from Nairn Centre in which opposition to the project was expressed. It was noted the correspondence was generated following presentations from the Ontario Rivers Alliance (ORA) which opposes all of Xeneca's waterpower projects. Following the PIC, Xeneca co-ordinated with the Mayor to plan an upcoming meeting for the Town of Nairn Centre.

Vale Inco representatives were in attendance. They requested LiDAR data and flow modeling to better determine if Xeneca's operating levels would have any impacts on Vale's Lorne Falls GS. LiDAR data was requested to assist Vale with investigation to make structural changes to its plant. The requested information was forwarded from Xeneca to Vale on July 26, 2012.

A Domtar representative posed questions on Xeneca's downstream effects. She noted that, despite the warm summer and low rainfall during the year, previously seen low water levels have not yet been seen at their mill site in Espanola. A copy of Xeneca's proposed Operating Plan was

requested and later forwarded to Domtar on July 26, 2012. Domtar also planned to share flow data recorded from the Espanola Power Plant.

Discussions with regard to the interests and concerns of the Vermilion River Stakeholders Committee took place.

Responding to questions on fisheries, Xeneca noted that the plant location was moved to ensure minimal impact on a spawning site and that operations would be adjusted to ensure that adequate flows would be maintained during the spawning period.

Several cottagers expressed interest in lake levels on Wabagishik Lake. Xeneca representatives explained that plant operations would ensure that lake levels will follow natural lake levels.

Daily fluctuation of the lake by plus or minus 5 centimetres is within the natural daily water level fluctuations caused by wind and wave action.

6.4.2. Focus Group Meetings

Vermilion River Stewardship

Numerous discussions were held via email and telephone exchanges between the Xeneca staff and a representative of the Vermilion River Stewardship (VRS). In a December 8, 2010, introductory email, the VRS expressed concerns regarding the proponent's proposed waterpower projects on the Vermilion River, noting urgency owing to the fact that approvals had already been granted without prior public notification. VRS asked the proponent about the influence of four proposed water control structures on the river, on public safety, on the ecosystem and on local inhabitants, noting the absence of public meetings in advance of the approvals, concerns with already decreasing water levels, and clarification regarding economic benefits of the undertaking to the local economy. A second electronic dispatch from VRS was issued to the proponent on January 14, 2011. The proponent responded with an acknowledgment of the received correspondences, welcoming the opportunity to meet with members of the VRS that would be in attendance at an upcoming local PIC that Xeneca was hosting for a different waterpower project.

The VRS met with the proponent at the March 22 2011 PIC. In a February 8, 2011 letter, the VRS made a formal request for all available documentation for all proposed Xeneca projects on the Vermilion River, and to be notified as new documentation was made available. VRS commented on the difficulty in securing documentation, answers to questions and project details and included in the letter a list of questions for which the group was seeking answers. A follow up email from VRS to the proponent requesting a date for a response to the documentation request and questions posed was sent on March 14, 2011. The proponent provided responses to the VRS

questions submitted in December 2010 and February 2011 on March 17, 2011. In this March 17, 2011 response, the proponent also explained at which stage of the Class EA the various requested documents would be released, and reiterated their commitment to protecting the environment and the affected users (see Appendix D).

Throughout March 2011, email and phone discussions were held between the proponent and the VRS about the formation of an independent committee to review the proposed Vermilion River projects and the proponent's requirement that Committee members sign confidentiality agreements. The VRS put forth suggestions for Committee chairs, but continued to voice concerns over the proposed developments. The proponent assured VRS that their concerns were being taken into account and that public consultation is an important component of the EA process. Subsequent to the Wabageshik Rapids PIC (held on March 22, 2011), the VRS submitted a list of additional questions and comments, and was critical of the proponent's methods in keeping the public informed, requesting that future public information events be held in a 'forum format'. The proponent drafted a response to these questions on May 8th, which included a Site Information Package and a Waterpower Applicant Declaration Form dated March 30th 2011.

Ontario Rivers Alliance

Xeneca met with representatives of the Ontario Rivers Alliance (ORA) on November 16, 2012. The ORA expressed concern over the level of transparency in the Class EA process and the typically large volume of material found in ER. Xeneca reiterated their commitment to providing ORA with a copy of the ER with as much advance notice as possible, and to provide "unlocked" versions of the documentation. In response to the ORA's concern regarding blue-green algae, which currently presents a problem in the Vermilion River, Xeneca explained that the proposed operations of the Wabageshik Rapids GS would not exacerbate the existing issue, stating that modified run-of river operation combined with smaller, relatively small head ponds will not typically increase algal blooms. During the meeting, Xeneca explained the anticipated timelines in moving their proposed developments forward.

A copy of the Draft ER for the proposed Wabageshik Rapids GS was sent to the ORA on February 1, 2013. At the time of writing of this ER, no formal review comments were received on the Draft ER.

Snowmobilers

On March 4, 2011, the President of the RCSA, also the Volunteer President of the Espanola and District Snowmobile Club (EDSC), contacted the proponent electronically noting errors in the Project Description mapping. The correspondence clarified that what was noted as an "Existing Bridge" on the Vermilion River was in fact a "Snowmobile Only Bridge." Additionally, it was

noted that the "Existing Local Road" was in fact a snowmobile trail, and that the trail is part of a trail network linking the communities of Espanola and Nairn Centre. RCSA noted the membership had significant concerns regarding the proposed undertaking and its proximity to the bridge (approximately 600-800 metres upstream of the proposed dam location) and trail network. It was also suggested by the RCSA that the proponent contact the OFSC about all their proposed waterpower projects since these may affect official ice crossing trails which may be located in proximity to proposed water control structures. Xeneca responded to the RCSA on March 4, 2011 (copied to the OFSC) confirming that there would be no impact to the snowmobile bridge, and extended an invitation for further discussion via telephone. It was also noted that there would be an opportunity to meet with Xeneca engineers and staff in Espanola on March 22, 2011 in advance of the PIC, to discuss the project. The proponent was contacted by the OFSC on March 4, 2011 expressing an interest in Xeneca's Vermilion River projects. Additional electronic correspondence was received on March 9, 2011 by the OFSC requesting assurances of continued access to the trail, and of the future condition of the trail. Additionally, the proponent was asked whether winter construction activities would impact snowmobile use on the trail in the project area. It was noted that the upstream zone of influence was shown to extend beyond the snowmobile bridge on project mapping. The proponent was asked to provide details on the increase in water levels at the bridge as a result of the project, and asked to specify how the bridge piers would be protected from ice and water. Finally, the proponent was asked to confirm whether they would accept liability for any damage to the bridge as a result of the undertaking. In a March 9, 2011 electronic response, the proponent stated that they will work with the snowmobile groups to ensure that the trails are maintained and alternative routes are established should the trails be unexpectedly impacted during construction. Xeneca stated that they would be willing to work with the groups towards maintaining or improving the existing trail. The proponent stated that water levels below the bridge will experience only a minimal increase, and indicated that flood flow up to a 1:100 year event could safely pass under the bridge. While unlikely that the project would result in ice jam formations at the bridge as a result of the project, the issue would be incorporated into the project design process.

In response to additional questions from the RCSA on March 23, 2011, the proponent noted that they do not intend to use the snowmobile bridge for either construction or future vehicular traffic and that any hydraulic modeling findings or inspection reports concerning the bridge could be provided to the affected snowmobile clubs, if requested. Subsequent to the March 22, 2011 PIC at which the President of the RCSA was present, a list of questions from the Club was forwarded to the proponent. The RCSA asked whether its snowmobile bridge on the Vermilion River would be used by the proponent during the construction program or to complete subsequent maintenance work in the project area. The RCSA questioned who would be responsible for bridge, pier and embankment inspections, any required upgrades, and whether the clubs would be provided with inspection results. Additionally, the RCSA identified a second

bridge, the Elizabeth Lake Bridge (south of Wabagishik Lake), raising similar questions. The proponent responded that it was not presently anticipating using the deck of the bridge for either construction or maintenance activities, and that preliminary hydraulic modeling was underway to determine if there would be any changes to existing flows on or in proximity to the bridge features. The proponent confirmed that it would provide the findings of the modeling to the snowmobiling community if requested. The proponent clarified that further study would be required before they could answer the questions regarding the necessity of, and responsibility for bridge upgrades, or inspection details. The then-preferred option for road access to Wabageshik Rapids GS was to construct a new road adjacent to the distribution line route; that access road would cross an existing snowmobile trail 900 m south of the GS and would require a single water crossing east of Elizabeth Lake (this option corresponds to the "New Road Option" discussed in Section 3.4). Currently, a bridge structure is in place spanning Brazil Creek, next to the Elizabeth Lake boat launch. This bridge was installed primarily to accommodate a snowmobile grooming machine and has a maximum rated capacity of 10 tons. Elizabeth Lake itself will not be intersected to provide access to the project site, and is located more than 2 km south of the project location. Flows from Elizabeth Lake flow northwest into the Vermilion River system downstream of the project site, near the junction of the Spanish River.

In a July 23, 2012 correspondence to the RCSA and EDSC, Xeneca made a formal commitment to maintain the integrity of the nearby snowmobile bridge. Xeneca stated that, should the bridge be damaged due to construction or operation of the Wabageshik Rapids GS, Xeneca will repair the bridge. During the detailed design phase, design engineers will create a quantifiable inspection chart for the Operations Manager to review on an annual basis. Additionally, Xeneca commits to working collaboratively with the snowmobiling community to ensure that engineering re-certification of the bridge (if required) is completed in a timely and cost-effective manner.

On August 27, 2012, Xeneca confirmed that there were no plans at the time to use the snowmobile bridges and trails to transport construction materials to the project site.

At a club meeting on October 11, 2012, the EDSC members in attendance passed a motion confirming that they have no objections to the construction of the Wabageshik Rapids GS based on the information provided to them up to August 27, 2012 (which at the time presented the "New Road Option" as the preferred access corridor). A copy of the motion was forwarded to Xeneca on the same day, and can be viewed in Appendix D of this ER.

Ontario Federation of Anglers (OFAH) and Hunters; United Walleye Clubs of Ontario (UWCO)

UWCO and OFAH were in attendance at a November 6, 2012 meeting with Xeneca, the MNR and the DFO, in which habitat compensation for the proposed project was discussed. UWCO

expressed interest in collaborating with Xeneca in creating a fish hatchery education centre in proximity to the Wabageshik Rapids GS site. UWCO indicated that their organization could supply the labour needed for construction.

The suggestion for creating a fish hatchery and education centre was explored further at a meeting between UWCO, OFAH club representatives and Xeneca on February 27, 2013. While the focus of the hatchery was initially to produce Walleye, OFAH and UWCO noted that the possibility of incorporating a Lake sturgeon rearing operation was also being explored, in order to restore the species to their historic range in the watershed. It was discussed that Xeneca could contribute funds and resources, while OFAH and UWCO could develop construction plans, contribute labor for construction and manage the operation and maintenance of the hatchery and education centre. A MOU in support of this goal was signed by Xeneca and UWCO on September 4, 2013.

Vale

Vale owns and operates a generating station on the Vermilion River at Lorne Falls near the outlet of Ella Lake, upstream of the proposed project location. The Vale facility (known as the Lorne Falls GS) operates as a run-of-river facility. In a November 12, 2010 correspondence, Vale's Senior Specialist -Environmental requested that the firm be added to the stakeholder list for the Wabageshik Rapids GS project, as well as for Xeneca's then-proposed waterpower project at Cascade Falls. In a March 18, 2011 email, the proponent reiterated commitments to minimize negative impacts to business and to enhance business opportunities where possible, and invited Vale to the March 22, 2011, PIC. Vale was not able to attend the PIC, but requested that they be informed of any future information sessions. Xeneca provided the contact information of its contracted biological consultant to Vale for a discussion regarding field studies.

In an April 11, 2011 letter to the proponent, Vale expressed concerns about the potential for negative impacts on its Lorne Falls tailrace levels, whereby any increase in tailrace levels to those experienced under natural conditions would result in a reduction in output and revenue at Lorne Falls GS. Vale stated they would not consent to the project if it would result in an increase in the water surface elevation of Wabagishik Lake. Vale also outlined additional information requirements it was seeking from the proponent.

On April 26, 2011, following telephone discussions, the proponent stated that no impact is anticipated on the tailrace at Lorne Falls, and proposed entering into discussions with Vale concerning water management planning. The proponent also presented a list of potential positive benefits to Vale. A meeting between both parties was held in late May 2011. A subsequent meeting with Vale was held on July 19th 2012, wherein an agreement in principle was reached that the operations of the proposed Wabagishik Rapids facility would not affect the

operational business of the Vale facility at Lorne Falls. In February of 2013, Xeneca had prepared Draft Agreements for Vale and Domtar with regard to the water management planning process for the Spanish-Vermilion River system.

In June of 2013, Xeneca issued a Commitment Letter to Vale, clarifying that the level of Wabagishik Lake will be controlled in a manner that mimics natural lake levels, to avoid any negative impact on tailrace levels at Lorne Falls GS, through utilization of an Operation Rating curve that would allow a daily deviation of no more than plus or minus 0.05 m in lake levels. Xeneca made a commitment to monitor lake levels daily in the tailrace area of the Lorne Falls GS, utilizing a geodetic datum consistent with the datum used in the Operational Rating curve, and to make operational data available to Vale at no charge. Xeneca also committed to providing annual reports to Vale comparing daily lake levels over the preceding year to the rating curve, and to compensating Vale for any revenue losses attributable to any deviation from the curve.

Vale returned Xeneca's commitment letter with some suggested changes. All requested changes were made by Xeneca and the agreement was returned to Vale.

Domtar

On November 8, 2012, Xeneca met with Domtar in Espanola. The focus of the meeting was on Domtar's operating parameters and contractual agreements. Domtar's measurement of instantaneous flows required to meet compensatory flow regulations was discussed. The low flow situation that took place in July of 2012 was discussed, and Domtar enquired regarding the potential advantages of releasing additional flow from Wabagishik Lake. The cumulative impacts of residential and commercial water withdrawals between the Stobie Dam and Lorne Falls were discussed. At the conclusion of the meeting, Domtar committed to conduct a legal review of the Draft Memorandum of Understanding (MOU) developed by Xeneca and to work with Xeneca toward a co-operative management approach.

On May 16, 2013, Xeneca met with Domtar in Espanola. Discussion took place regarding Domtar's minimum flow requirements to maintain effective effluent dilution downstream of the mill. High flows and the impact of upstream operations were discussed. Xeneca suggested the installation of monitoring equipment downstream of Nairn Centre, which is located upstream of the confluence of the Vermilion and Spanish Rivers, which would provide better real-time flow and volume information which could quickly alert Domtar in advance of flow changes impacting their headpond. Xeneca also committed to initiating a communication protocol with Domtar that would enable Domtar to optimize its hydro generation operations, while minimizing Domtar's operational challenges. Both parties discussed the Draft MOU and the timeframes required for the completion of Xeneca's EA. At the meeting's conclusion, Domtar advised

Xeneca they would like an accredited third-party review of Xeneca's Operating Plan and commitments.

Xeneca has provided a third version of their MOU to Domtar, who noted that the MOU must be reviewed by their corporate legal department prior to it being signed. However, until the impact of the Project on the Domtar operation is known, no agreement can be made with Domtar in respect to this project.

In the latest version of their MOU to Domtar, Xeneca committed to operating the Wabageshik Rapids GS such that it will have no negative impacts on the operations of the Domtar dam in Espanola. The MOU letter commits to Domtar that:

- Under low-flow conditions, Xeneca will operate in a manner that assists Domtar in meeting its effluent dilution and minimum flow requirements.
- Xeneca will constrain its operations to ensure flows received at Domtar from the Wabageshik Rapids GS will not exceed Domtar's ability to process water through its turbines.
- Indemnify Domtar against any losses that occur as a direct result of Xeneca's operation of its Wabageshik Rapids GS.
- Xeneca will provide real-time flow data from the Vermilion River to Domtar.
- Xeneca will work with Domtar to help them optimize their hydro operations.

Domtar has requested a third party review of Xeneca's commitments and Xeneca will work with Domtar and the third party to finalize this agreement as soon as possible.

If for any reason Xeneca and Domtar cannot reach a final agreement, Xeneca will operate at 6.5 m^3/s, which will provide the minimum flows required to maintain the agreed-upon effluent dilution levels. Please refer to the proposed Operating Plan (Annex I) for more details.

On July 25, 2013 Domtar issued Xeneca a letter outlining the requirements that would need to be fulfilled for Domtar to sign a Memorandum of Understanding. Outstanding requirements include the need for the high flow and low flow issues to be adequately resolved at no cost to Domtar, and that Xeneca must provide financial indemnification for any losses of revenue to Domtar associated with their operations. Domtar also requested that a good issue dispute resolution process must be put into place. Impacts of the Wabageshik Rapids project downstream of the Domtar Dam need to assess the impact on Lake sturgeon. Domtar identified the need for further analysis on the impact of the project on the Spanish River downstream of the Domtar facility, and on the impact on instantaneous flow at the Domtar facility.

On August 7, 2013, Xeneca provided their responses to the concerns outlined in Domtar's July 25, 2013 letter. Xeneca clarified the mitigation measures that will be adopted to minimize and/or avoid potential negative impacts on operations and effluent dilution requirements at the Domtar dam. Xeneca committed to operations that do not force Domtar to spill water or cause Domtar to vary flows downstream of its Espanola GS, thus ending the Wabageshik Rapids GS' ZOI within the Domtar headpond. Further Xeneca committed to indemnifying Domtar from costs incurred from any negative effects resulting from operations at the Wabageshik Rapids GS, and agreed to a third-party review of the proposed Operating Plan of the Wabageshik Rapids GS.

Other

In a March 18, 2011 email, the proponent introduced itself to Xstrata Nickel, noting the proposed project and the upcoming PIC; no response was received.

6.5. ABORIGINAL ENGAGEMENT

6.5.1. Aboriginal Engagement Introduction

Xeneca's general approach to Aboriginal engagement and consultation follows:

- the Ontario Waterpower Association Class EA process and best practices adopted from the Ontario Power Authority (OPA) *Consulting with First Nations and Métis Communities: Best Practices, Good Business*(Ontario Power Authority, July 2008) document; and
- the Government of Canada's *Aboriginal Consultation and Accommodation: Updated Guidelines for Federal Officials to Fulfill the Duty to Consult* Guide *(AAND 2011).*

Using these documents Xeneca developed an Aboriginal Consultation Plan that outlines a proposed approach to consultation with Aboriginal communities.

Xeneca has drafted an Aboriginal Consultation Plan which contains methods and goals for Aboriginal consultations during the Class EA period. Highlights of these goals are defined below, a full text of the Aboriginal Consultation Plan can be found in Appendix E.

General Consultation Protocol

Xeneca places great importance on its relationships with potentially affected Aboriginal communities and has created an Aboriginal Relations Liaison position within Xeneca to manage Aboriginal Relations Policy, Guiding Principles and ensure that the consultation requirements of the Class EA are satisfied.

To support the Crown's Duty to Consult to the best of its ability Xeneca proposes to:

- Provide project information to potentially affected communities and to be responsive to questions, concerns and input in a timely manner;
- Through the environmental assessment planning process provide all available information and accept from Aboriginal communities all information they wish to share regarding existing and traditional use for those resources and environmental components that might be impacted by the project;
- Ensure that any traditional knowledge shared by a Community is presented in an agreed upon manner to ensure that it remains the property of the Community;
- Afford consideration to any potential adverse impacts to treaty rights in the Class EA planning process;
- Clearly outline the EA Consultation and engagement process, and potential project related issues to the Communities;
- Maintain records of correspondence and engagement;
- Reflect on input questions and responses in the EA Report and subsequent processes accurately, respectfully and in a timely manner;
- Seek to have Aboriginal Communities obtain benefits from the projects where reasonably possible;
- Respect an Aboriginal Community's right not to engage; and
- Provide the Crown requested information concerning the proponent's Aboriginal consultation and engagement activities.

Xeneca is committed to carry out engagement with identified Aboriginal Communities & Métis Councils through written correspondence and direct telephone communications, including follow up on numerous occasions if communities are non-responsive. Upon appropriate direct contact, Xeneca has sought meetings with community leaders or designated lead person(s) in order to introduce Xeneca and the projects which may impact that particular community. Upon receiving an invitation from the host Aboriginal Community, Xeneca will conduct and sponsor community engagement sessions. Xeneca is also prepared, when requested, to provide access to its professional staff and consultants to answer technical questions. Finally, where a request is made Xeneca is committed to providing necessary resources to support meaningful engagement including the retention of external consultants to peer review material presented to the communities.

By meeting these objectives and following the above-noted processes, Xeneca hopes to foster and sustain a mutually respectful relationship with its aboriginal neighbors beyond the requirement to provide consultation support to the Crown.

The following is a list of methods of communication and engagement approaches employed throughout the EA Process in order to seek input from the Aboriginal communities involved with the Wabagishik Project:

- Providing project information to potentially affected communities and being responsive to questions, concerns and formal engagement letters;
- Follow-up Email(s) and phone call(s);
- Formal invitations to participate in Public Information Centres (PICs);
- Offer to host information sessions in individual Communities;
- Extend invitations and offer financial assistance to participate in Stage II Archaeological field work program;
- Provide financial resources, technical staff and consultants to assist in the review of the Draft Environmental Report and supporting documents.

In certain circumstances, Xeneca has supported community initiatives, such as fishing derbies, and tradeshow conferences, when a request has been brought forward by the community.

Where Xeneca has received a protocol from the Aboriginal community that provides details on how the communities are to be consulted with, Xeneca has collaborated with the community to create a mutual understanding on a process to proceed.

6.5.2. Identified Communities

The identification of communities was completed through consultation with the Sudbury District office of the Ministry of Natural Resource (MNR) as part of the Crown Land Site Release (Site Release) process. A Site Information Package was provided in February of 2011 outlining aboriginal communities and the level of interest or participation as part of the Site Release process. These communities are listed below:

- Atikameksheng Anishnawbek (Whitefish Lake FN)
- Sagamok Anishnawbek
- Wikwemikong Unceded Indian Reserve
- Whitefish River First Nation
- Sudbury Métis Council
- North Channel Métis Council

The identification of Federal Aboriginal Communities for consultation was completed through written direction from Transport Canada, with assistance from Fisheries and Oceans Canada, National Defence and Aboriginal Affairs and Northern Development Canada, to further define communities which may have treaty rights, traditional territories or interests within the project

areas by way of correspondence dated October 28, 2011. This letter defined communities in addition to those listed above. These communities are listed below:

- Serpent River First Nation
- Aundeck-Omni-Kaning (Sucker Creek) First Nation
- M'Chigeeng First Nation
- Sheguiandah First Nation
- Wahnapitae First Nation
- United Chiefs and Councils of Mnidoo Mnising
- Below is a table (Table 13) of each community identified and their organizational structure.

Table 13 – Community Organization

Community/Community Council	Tribal Council/Region	Grand Council/Nation
Aundeck-Omni-Kaning (Sucker Creek) First Nation	United Chiefs & Councils of Mnidoo Mnising	Union of Ontario Indians
M'Chigeeng First Nation	United Chiefs & Councils of Mnidoo Mnising	Union of Ontario Indians
North Channel Métis Council	Region 5/ Mattawa/ Lake Nipissing Traditional Territory	Métis Nation of Ontario
Sagamok Anishnawbek	Mamaweswen, The North Shore Tribal Council Secretariat	Union of Ontario Indians
Serpent River First Nation	Mamaweswen, The North Shore Tribal Council Secretariat	Union of Ontario Indians
Sheguiandah First Nation	United Chiefs & Councils of Mnidoo Mnising	Union of Ontario Indians
Sudbury Métis Council	Region 5/ Mattawa/ Lake Nipissing Traditional Territory	Métis Nation of Ontario
Wahnapitae First Nation	Waabnoon Bemjiwang Association of First Nations	Union of Ontario Indians
Wikwemikong Unceded Indian Reserve	None	Union of Ontario Indians
Whitefish Lake First Nation (Atikameksheng Anishnawbek)	Mamaweswen, The North Shore Tribal Council Secretariat	Union of Ontario Indians
Whitefish River First Nation	United Chiefs & Councils of Mnidoo Mnising	Union of Ontario Indians

Additional Consultation Communities

Xeneca also consulted with the following Communities which were not identified by the MNR or by Transport Canada as Consultation Communities:

- Métis Nation of Ontario
- Union of Ontario Indians

6.5.3. Consultation through Site Release

The aboriginal consultation and engagement process began as a component of the Crown Land Site Release Process, and has included components of the Waterpower Class EA (Class EA) planning process in parallel. An application was made for this site through the Crown Land Site Release process in 2007. The engagement process as required by the Site Release Process and the Consultation Process as required by the Class EA process, were connected and where possible completed in parallel.

While Site Release and the consultation process required by the Class EA were connected and completed in parallel, a separate report updating the MNR on the status of the consultation process for the Site Release process will be completed independently of this Class EA.

6.5.3.1. Areas under Land Claim

The majority of the identified communities are signatories to the Robinson – Huron Treaty 1850, except Wikwemikong Unceded Indian Reserve whom are not signatories to a treaty, the North Channel Métis Council and the Sudbury Métis Council. The project is located wholly within the area of the Robinson – Huron Treaty of 1850.

There is presently a Comprehensive Land Claim Agreement in Principle with respect to Governance on file between the Canadian Federal Government and the Anishinabek Nation/ Union of Ontario Indians which is the Grand Council of Robinson – Huron Treaty of 1850, and represents all those communities which are signatories to these Treaties (refer to Table 13). At this time a final agreement has not been negotiated (Minister of Affairs and Northern Development and Federal Interlocutor for Métis and Non-Status Indians, 2007).

The Project location is not located within the boundaries of any First Nation reserve lands, nor areas expressly stated as protected through Robinson – Huron Treaty of 1850. Communities may assert protections to activities and rights under this treaty which are not explicitly stated within the treaty text. Where those rights are asserted they have been documented as impacts. The Project location is assumed to be within the traditional territories and current usage areas of the aboriginal communities engaged and consulted throughout the Class EA process.

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5150000 000000

5100000 000000

5050000 000000

Wahnapitae

SUDBURY

ELLIOT LAKE

NORTH BAY

Whitefish Lake

Vermillion River

ESPANOLA

Serpent River

Sagamok Anishnawbek

KILLARNEY LAKELANDS AND HEADWATERS PROVINCIAL PARK

Whitefish River

FRENCH RIVER PROVINCIAL PARK

Aundeck-Omni-Kaning

Sheguiandah

M'Chigeeng First Nation

MANITOULIN ISLAND

Wikwemikong Unceded

Georgian Bay

May 16, 2013 UTM 17N. MNR CANMAP data and data from ainc-inac.gc.ca. Produced by: Kerri-Ann Jones

Robinson - Huron Treaty 1850 and 1854

Indian Reserves

Provincial Parks

Lakes and Rivers

Wabageshik Dam Site

ORTECH Power

30 15 0 30 Kilometers

Data Sources:

First Nations Treaties (2011) printed map retrieved at www.tanakiwin.com.

All background data sourced from MNR CANMAP data files.

6.5.3.2. Consultation Requirements

The Class EA requires that aboriginal communities be consulted with regards to their rights within treaty and traditional lands and how they may be impacted by project activities. This consultation and engagement is designed in part to help determine whether the Crown has a legal duty to consult under the Constitution Act of 1982, and is not intended to replace that duty. The Class EA requires that aboriginal engagement includes consultation as required for the general public, as well as recommending active engagement to determine if the project activities will impact aboriginal uses and values within the area.

What follows below is a description of the major highlights of engagement and consultation as it relates to the Class EA. A full description of all consultation activities, copies of major correspondence and a log of all correspondence can be found in Appendix E. It is expected that consultation activities will continue throughout final permitting, design and the lifecycle of the Project.

6.6. COMMUNITY ENGAGEMENT AND CONSULTATION

On November 13, 2012 a meeting was held between the Proponent and the following communities: M'Chigeeng First Nation, Sagamok Anishnawbek, Aundeck Omni Kaning, Wikwemikong Unceded Indian Reserve, Whitefish River First Nation, United Chiefs & Councils of Mnidoo Mnising. Representatives from Whitefish Lake First Nation, Sheguindah First Nation, Serpent River First Nation and Wahnapitae First Nation were invited to participate but were unable to attend. During this meeting the groups attending came to a consensus that Sagamok Anishnawbek would be responsible for the peer review of the EA Report and supporting studies and documents including the Archaeology study on behalf of the group. More details related to this group are referenced throughout the consultation summaries for each community that participated in the group. A full discussion on this group and their findings can be found in section 6.6.15.

6.6.1. Aundeck-Omni-Kaning (Sucker Creek) First Nation

Aundeck-Omni-Kaning is a member of the United Chiefs & Councils of Mnidoo Mnising Tribal Council and a signatory to the Robison Huron Treaty of 1850. The community engages in woodland style antler carving, as well as other types of leather and beadwork in the traditional style. They also engage in traditional hunting activities for deer, moose, rabbits and partridge. Harvesting of vegetables, herbs, timber, morels and maple syrup are important activities carried out by the local community. The community also hosts a Rainbow Trout fish farm which was developed in 1992, and is home to a tourism operator who focuses on eco-tours of Manitoulin Island (Aundeck Omni Kaning).

This community is a member of a First Nations EA Peer review group, which was established, in late 2012. They have chosen to delegate discussions related to Environmental Assessment concerns to Sagamok First Nation. Further information on these discussions can be found in Section 6.6.15.

6.6.1.1. Summary of Engagement

Aundeck-Omni-Kaning First Nation was notified about the project on July 26, 2012 when a formal letter was sent introducing the company, notifying the community of the Project, the need for a Class EA process, the federal EA process, and providing an Aboriginal Consultation Plan. This letter provided contact information for Xeneca and invited the community to establish a time to meet with the company to discuss the development.

On July 27, 2012 Xeneca provided the community a package of information containing copies of several important project specific documents. The package included copies of all of the Notice of Commencements, along with past communications, and a Project Description.

In August of 2012 the Community was notified that as per the Stage II archaeological recommendations Xeneca would be choosing to avoid the significant archaeological find at the project site, and that further studies would not be completed at this time.

On October 30, 2012 Xeneca provided the Community with a copy of the *"Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"* dated August 2012for the Community's review and comment.

On November 5, 2012 Xeneca extended an invitation to the Community to participate in a meeting to discuss the Project. This meeting was a multi-community coordination meeting which was to be attended by many First Nations groups which had interests in the Project in order to discuss the Environmental Assessment.

On November 9, 2012 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project.

On April 11, 2013 Xeneca provided the Community with a copy of the Stage II archaeological assessment for their review and comment.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

Table 14 – Aundeck-Omni-Kaning First Nation ER Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	July 27, 2012 & September 5, 2012	Chief Patsy Corbiere
Notice of Commencement	July 27, 2012	Chief Patsy Corbiere
Draft Environmental Report	October 30, 2012	Chief Patsy Corbiere
Updated Project Description	November 9, 2012	Chief Patsy Corbiere

6.6.1.2. Current Status of Consultation and Engagement

Throughout this period Xeneca has continued to engage Aundeck-Omni-Kaning First Nation individually and through the United Chiefs & Councils of Mnidoo Mnising. To date the community has not tabled any specific concerns related to aboriginal treaty rights, traditional lands or specific community issues. Any concerns raised have been raised through the EA Peer Group and are reflected in the EA Peer Review Table in Section 6.6.15. A full reference to all identified comments and concerns can be found in Appendix E. Based on a general understanding of the community's traditional and current use of the area, potential concerns for the community are listed in the impact and mitigation matrix in the potential project effects table, Section 7. Consultation and engagement with this community will continue throughout the construction period, and into the lifecycle operations of the project.

6.6.2. M'Chigeeng First Nation

M'Chigeeng First Nation is a member of the United Chiefs & Councils of Mnidoo Mnising and the Union of Ontario Indians and is a signatory to the Robinson - Huron Treaty of 1850. The community has one reserve, M'Chigeeng 22, located 21 km south west of Little Current on Manitoulin Island (Aboriginal Affairs and Northern Development Canada, 2013). The community has recently completed the development of a 4 MW wind power facility in their traditional territory; they have additional wind and solar projects planned for development in 2013 and 2015 (3G Energy, 2011).

6.6.2.1. Summary of Engagement

M'Chigeeng First Nation was notified about the project on July 26 2012 when a formal letter was sent introducing the company, notifying the community of the project, the need for a Class EA process, the federal EA process, and providing an Aboriginal Consultation Plan. This letter

provided contact information for Xeneca and invited the community to establish a time to meet with the company in the future to discuss the development.

On July 27, 2012 Xeneca provided the community a package of information containing copies of several important project specific documents. The package included copies of all of the Notice of Commencements, along with past communications, and a Project Description.

In August of 2012 the Community was notified that as per the Stage II archaeological recommendations Xeneca would be choosing to avoid the significant archaeological find at the project site, and that further studies would not be completed at this time.

In September of 2012 Chief Hare requested that an inter-community discussion with regards to accommodation occur. Xeneca began to facilitate this request and invited other communities to participate in this discussion. Further information on this inter-community discussion can be found in section 6.6.15.

On October 30, 2012 Xeneca provided the Community with a copy of the *"Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"* dated August 2012for the community's review and comment.

On November 5, 2012 Xeneca extended an invitation to the Community to participate in a meeting to discuss the Project. This meeting was a multi-community coordination meeting which was to be attended by many First Nations groups which had interests in the Project in order to discuss the Environmental Assessment.

On November 9, 2012 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project.

On April 11, 2013 Xeneca provided the Community with a copy of the Stage II archaeological assessment for their review and comment.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

Table 15 – M'Chigeeng First Nation ER Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	July 27, 2012 & September, 2012	Chief Joe Hare
Notice of Commencement	July 27, 2012	Chief Joe Hare
Draft Environmental Report	October 30, 2012	Chief Joe Hare
Updated Project Description	November 9, 2012	Chief Joe Hare

6.6.2.2. Current Status of Consultation and Engagement

Throughout this period Xeneca has continued to engage M'Chigeeng First Nation both individually, and through the United Chiefs & Councils of Mnidoo Mnising. To date the community has not individually tabled any specific concerns related to aboriginal treaty rights, traditional lands or specific community issues. Any issues they may have were raised by the EA Peer review group and are reflected in Table 30 in Section 6.6.15 and in the Aboriginal Issues and Concerns Table, located in Appendix E. Consultation and engagement with this community will continue throughout the construction period, and into the lifecycle operations of the project.

6.6.3. North Channel Métis Council

The MNO Timmins Métis Council is a member of Region 4 Historic Sault Ste. Marie of the Métis Nation of Ontario. They have traditional territories in the lands surrounding the Projects; however, they are not signatories to the Robinson – Huron Treaty of 1850. They presently engage in hunting, fishing, trapping and harvesting activities in their traditional areas (Métis Nation of Ontario, 2013).

6.6.3.1. Summary of Consultation

The Community was contacted in April of 2011 by the Sudbury District office of the MNR to notify them that an application for Site Release had been made by Xeneca, and that site release would be occurring concurrently with an Environmental Assessment Process. Additionally this letter listed their community as a local community which potentially had interests in the Project.

On July 18, 2011 Xeneca provided the Community summary reports for the Stage 1 archaeological work that was completed on the Project site. They also invited the Community to participate in the Stage II archeological field work which had yet to be scheduled.

In August 2011 Xeneca provided an Aboriginal Consultation Plan, for review and comment. On July 23, 2012 a revised Aboriginal Consultation Plan was provided to the Community which included federal revisions and additional communities resulting from federal consultations.

On October 12, 2011 the community was invited to a Public Information Centre (PIC) for the Project which was held on October 20, 2011 in Espanola.

On December 13, 2011 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project

On July 12, 2012 the community was invited to a PIC for the Project which was held on July 25, 2012 in Espanola. At this time Xeneca also extended an offer to host a meeting specific to the North Channel Métis.

In August of 2012 the Community was notified that as per the Stage II archaeological recommendations Xeneca would be choosing to avoid the significant archaeological find at the project site, and that further studies would not be completed at this time.

On October 30, 2012 Xeneca provided the Community with a copy of the *"Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"* dated August 2012 for the community's review and comment.

On April 11, 2013 Xeneca provided the Community with a copy of the Stage II archaeological assessment for their review and comment.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

On July 16, 2013 Xeneca provided the Community with a copy of the final Notice of Commencement along with a copy of the Project Description for their records.

Table 16 – North Channel Métis Council ER Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	July 16, 2013	Ms. Lori Witty
Notice of Commencement	July 16, 2013	Ms. Lori Witty
Draft Environmental Report	October 30, 2012	Mr. Daniel Belisle
Updated Project Description	December 13, 2011	Mr. Daniel Belisle

6.6.3.2. Current Status of Consultation and Engagement

Throughout this period Xeneca has engaged the North Chanel Métis Council directly and through the Métis Nation of Ontario. This engagement and consultation process is progressing towards a Memorandum of Understanding (MOU) on their behalf through the Métis Nation of Ontario. To date the community has not tabled any specific concerns related to aboriginal treaty rights, traditional lands or specific community issues. Based on a general understanding of the community's traditional and current use of the area, potential concerns for the community are listed in the impact and mitigation matrix in Section 7. Consultation and engagement with this community will continue throughout the construction period, and into the lifecycle operations of the project.

6.6.4. Sagamok Anishnawbek

Sagamok Anishnawbek is a member of Mamaweswen, the North Shore Tribal Council Secretariat and a signatory to the Robinson Huron Treaty of 1850. They presently hold a reserve in the Massey Area (Aboriginal Affairs and Northern Development Canada, 2013b).

6.6.4.1. Summary of Engagement

Sagamok Anishnawbek was notified about the project in June 2010 when a formal letter was sent introducing the company, notifying the community of the project, the need for a Class EA process, and providing information related to the Site Release. This letter provided contact information for Xeneca and contact information for the MNR if any further information was required.

In September of 2010, Xeneca sent a letter inviting the community to participate in the archaeological studies at the project location. A follow up to this letter was sent on May 13, 2011 in which Xeneca provided the community summary reports for the Stage 1 archaeological work that was completed on the Project site. They also invited the Community to participate in the Stage II archeological field work which had yet to be scheduled.

In October 2010, Xeneca sent a letter inviting the community to a preliminary Public Information Centre (PIC) on November 22 and 23, 2010. Due to unforeseen circumstances, this PIC was canceled and a formal letter notifying the community of this change was sent on October 25, 2010.

In December, 2010 the Class EA began in earnest and Xeneca sent the community a letter to notify them that this process had begun. This package included copies of the Draft Project Description for the Project.

On April 26, 2011 the Sudbury District office of the MNR provided the community with a letter giving the community notice that Xeneca had entered into a formal site release process concurrently with the Environmental Assessment process and that Sagamok Anishnawbek was an identified community for engagement in the business to business relationships portion of the site release process. This letter also provided additional guidance specifically related to the Site Release Process. MNR also requested the identified communities provide information pertaining to the communities concerns or aboriginal treaty rights as it related to project developments.

On May 13, 2011 Xeneca provided the community a package of information containing copies of several important project specific documents. The package included copies of all of the Notice of Commencements, along with past communications, and a Project Description.

In August 2011 Xeneca provided an Aboriginal Consultation Plan, for review and comment.

On September 6, 2011 Xeneca offered the Community an opportunity to participate in the Stage 2 archaeological field investigation and provided them with details and a schedule for the upcoming field work program. Sagamok attempted to send a Community member to participate in the field program; however they were unable to do so at the time.

On October 12, 2011 the community was invited to a Public Information Centre (PIC) for the Project which was held on October 20, 2011 in Espanola.

On December 13, 2011 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project.

Following a meeting with a Community representative in June 2012, Xeneca began to make arrangements to host a community information meeting for July 24, 2012 the day before their Public Information Center was scheduled in Espanola. The meeting did not occur due to community elections.

On July 12, 2012 the community was invited to a PIC for the Project which was held on July 25, 2012 in Espanola. At this time Xeneca also extended an offer to host a meeting specific to the Community.

In July 2012 the community was notified that the Stage III archaeological work was commencing and asked if they would like to participate and send a field monitor for that work.

In August of 2012 the Community was notified that as per the Stage II archaeological recommendations. Xeneca would be choosing to avoid the significant archaeological find at the project site, and that the Stage III assessment work would not be completed at this time.

In September 2012 Sagamok was asked if they would be interested in participating in an inter-community discussion with regards to accommodation, responding to a request from Chief Hare of M'Chigeeng First Nation. Further information on this inter-community discussion can be found in Section 6.6.15.

On October 30, 2012 Xeneca provided the Community with a copy of the *"Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"* dated August 2012 for the community's review and comment.

On November 5, 2012 Xeneca extended an invitation to the Community to participate in a meeting to discuss the Project. This meeting was a multi-community coordination meeting which was to be attended by many First Nations groups which had interests in the Project in order to discuss the Environmental Assessment.

On February 27, 2013 Xeneca provided the Community with copies of comments and major issues raised by agencies (MNR, DFO, MOE, EC), along with Xeneca's responses.

On April 11, 2013 Xeneca provided the Community with a copy of the Stage II archaeological assessment for their review and comment.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

On August 23, 2013, Xeneca provided the Community with a copy of the final version of their proposed Operating Plan and Water Management Plan Amendment (OP) document for the Wabagishik Rapids project.

On September 19, 2013 Chief Paul Eshkakogan issued a letter to Xeneca stating that he was satisfied to date with the status of the consultation and the efforts made to date by Xeneca with regards to information sharing and review. This letter can be found in Appendix E.

Table 17 – Sagamok Anishnawbek ER Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	December 20, 2010	Chief Paul Eshkakogan
Notice of Commencement	May 13, 2011	Chief Paul Eshkakogan
Draft Environmental Report	October 30, 2012	Chief Paul Eshkakogan
Updated Project Description	December 13, 2011	Chief Paul Eshkakogan

6.6.4.2. Current Status of Consultation and Engagement

Throughout this period Xeneca has continued to engage Sagamok Anishnawbek individually. Additionally Sagamok has been involved as a lead member of the EA Peer Review Group. To date this community has worked with a consultant to table several concerns and issues which can be found in the EA Peer Review Table (Table 30 below). Based on a general understanding of the community's traditional and current use of the area, potential concerns for the community are listed in the impact and mitigation matrix in section 7. Additionally this community has provided a letter as described above, which outlines their satisfaction with the consultation process to date and their commitment to continue to work with Xeneca to review the Final ER.

Table 18: Sagamok Anishinabek Issues and Concerns Tracking Table

Issue / Concern Raised	Date Identified	Response on Record
Lack of Sturgeon Sampling completed in 2010 field season.	13-Jul-11	In addition to the 2011 sturgeon study, a full year of study was completed in 2012.
Chief wants inter-First Nation approach.	16-Jan-12	Noted. This recommendation was acted on and an intercommunity meeting was called in November 2012, which lead to the formation of the First Nation EA Peer Review Group. Further Information can be found **Section 6.5, Aboriginal Engagement section** of the Wabagishik Class EA Report.

Request for a meeting to discuss implementation of MOU as signed (approximately one year earlier) and to discuss business to business relationships. Also requested status update on plans and activities for all Xeneca projects in their traditional territory.	28-May-12	Meeting held June 12, 2012 to provide status update on all activities for all Xeneca projects.
Key question council and representatives will ask [in future meeting] is how well the project measures against Sagamok natural resource stewardship principles.	12-Jun-12	Xeneca provided Sagamok the Biological reports, archaeological reports and a copy of the draft environmental assessment for their internal review as part of the EA Peer review group review in January 2013. This review allowed for the group to assess the project against the community's natural resource stewardship principles.
Concern regarding the archaeological study and the fact stage II archaeology may have indicated First Nation use of the site.	15-Jun-12	The Belmer site which is the location identified in the Stage II archaeological study as being significant, will be fully avoided and protected by employing mitigation measures during construction as approved by MTCS which include delineation of the eastern boundary of the site, and establishing a second fence 70m from this eastern boundary to prevent construction personnel from entering the site.
What are the specifics of the Stage II Archaeology study, and what 'values' may have found on site.	13-Jul-12	The Stage 2 archaeology study was provided to Sagamok in January 2013 as part of EA Peer review group in January 2013. This report provided information on specific values and finds discovered at the site.
Would like to obtain copy of archaeological stage II study (full, not public).	31-Jan-13	Xeneca sent SENES the Stage 2 public report. Full report cannot be issued until it has been approved and a clearance letter issued by MTCS.
	21-Feb-13	Full copy sent to SENES. Avoidance strategy documentation was sent to individual communities in July of 2013.

Are there Sturgeon in the lake now?	07-Jun-13	Sturgeon not likely to be found in Wabagishik Lake. There have been no previous reports of occurrence.
What is Bruce Kilgour proposing as part of his study? The First Nation will need to be satisfied with the approach.	07-Jun-13	Kilgour recommended that if you wanted to definitively determine that Sturgeon are not upstream, an extensive telemetry study would have to be carried out over multiple years (i.e. Sturgeon only spawn every 5 years). However, in light of any existing evidence of sturgeon upstream, it was discussed with FN that efforts might be better spent on a sturgeon restoration initiative downstream. This initiative is being considered and Xeneca has offered to support such an initiative if FN want to move forward with it. Xeneca has suggested to combine the Walleye hatchery (already committed to) with a sturgeon hatchery.
Sagamok does not have the [Vale] background reports [on the Vermillion] but needs to have them.	07-Jun-13	Xeneca has made this request on behalf of Sagamok but has not received anything from Vale.

6.6.5. Serpent River First Nation

Serpent River is a member of Mamaweswen The North Shore Tribal Council Secretariat and the Union of Ontario Indians and is a Signatory to the Robinson - Huron Treaty of 1850. They are primarily located in Cutler Ontario (Aboriginal Affairs and Northern Development Canada, 2013c).

6.6.5.1. Summary of Engagement

Serpent River First Nation was notified about the project on July 26 2012 when a formal letter was sent introducing the company, notifying the community of the Project, the need for a Class EA process, the federal EA process, and providing an Aboriginal Consultation Plan. This letter provided contact information for Xeneca and invited the community to establish a time to meet with the company in the future to discuss the development.

On September 5, 2012 Xeneca provided the Community with a copy of the Wabagishik Rapids Project Description.

On October 30, 2012 Xeneca provided the Community with a copy of the "Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"dated August 2012for the community's review and comment.

On November 5, 2012 Xeneca extended an invitation to the Community to participate in a meeting to discuss the Project. This meeting was a multi-community coordination meeting which was to be attended by many First Nations groups which had interests in the Project in order to discuss the Environmental Assessment.

On November 9, 2012 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project.

On April 11, 2013 Xeneca provided the Community with the Stage II archaeological report for review and comment.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

On July 16 2013 Xeneca provided the Community with a copy of the final Notice of Commencement along with a copy of the Project Description for their records.

Table 19 – Serpent River First Nation ER Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	September 5, 2012	Chief Isadore Day
Notice of Commencement	July 16, 2013	Chief Isadore Day
Draft Environmental Report	October 30, 2012	Chief Isadore Day
Updated Project Description	November 9, 2012	Chief Isadore Day

6.6.6. Current Status of Consultation and Engagement

Throughout this period Xeneca has continued to engage Serpent River First Nation individually. To date the Community has not tabled any specific concerns related to aboriginal treaty rights, traditional lands or specific community issues. Based on a general understanding on the community's traditional and current use of the area, potential concerns for the community are listed in the impact and mitigation matrix in section 7. Consultation and engagement with this

Community will continue through the construction period, and into the lifecycle operations of the Project.

6.6.7. Sheguiandah First Nation

Sheguiandah First Nation is a member of the United Chiefs & Councils of Mnidoo Mnising Tribal Council and a signatory to the Robison Huron Treaty of 1850. They presently hold a reserve, Sheguiandah 24, 8 km outside of Little Current on Manitoulin Island (Aboriginal Affairs and Northern Development Canada, 2013d).

6.6.7.1. Summary of Engagement

Sheguiandah First Nation was notified about the project on July 26 2012 when a formal letter was sent introducing the company, notifying the community of the Project, the need for a Class EA process, the federal EA process, and providing an Aboriginal Consultation Plan. This letter provided contact information for Xeneca and invited the community to establish a time to meet with the company in the future to discuss the development.

On July 27, 2012 Xeneca provided the community a package of information containing copies of several important project specific documents. The package included copies of all of the Notice of Commencements, along with past communications, and a Project Description.

In August of 2012 the Community was notified that as per the Stage II archaeological recommendations Xeneca would be choosing to avoid the significant archaeological find at the project site, and that further studies would not be completed at this time.

On September 5, 2012 Xeneca provided the Community with an additional copy of the Wabagishik Rapids Project Description.

On October 30, 2012 Xeneca provided the Community with a copy of the *"Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"* dated August 2012for the community's review and comment.

On November 5, 2012 Xeneca extended an invitation to the Community to participate in a meeting to discuss the Project. This meeting was a multi-community coordination meeting which was to be attended by many First Nations groups which had interests in the Project in order to discuss the Environmental Assessment.

On November 9, 2012 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project.

On April 11, 2013 Xeneca provided the Community with the Stage II Archaeological Report for review and comment.

On May 31, 2013, Xeneca extended an invitation to the Community to participate in a field trip to the culturally significant Belmer site, although members of the Community were unable to attend. Photographs and summary notes from the field trip were provided to the Community on July 8, 2013.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

Table 20 – Sheguiandah First Nation ER Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	July 27, 2012 & September 5, 2012	Chief Orville Aguonie
Notice of Commencement	July 27, 2012	Chief Orville Aguonie
Draft Environmental Report	October 30, 2012	Chief Orville Aguonie
Updated Project Description	November 9, 2012	Chief Orville Aguonie

6.6.7.2. Current Status of Consultation and Engagement

Throughout this period Xeneca has continued to engage Sheguiandah First Nation individually. To date the Community has not tabled any specific concerns related to aboriginal treaty rights, traditional lands or specific community issues. Any concerns raised have been raised on their behalf through the EA Peer Group and can be found in Section 6.6.15. Based on a general understanding of the community's traditional and current use of the area, any issues are listed in the impact and mitigation matrix in section 7. Consultation and engagement with this Community will continue through the consultation period, and into the lifecycle operations of the Project.

6.6.8. Sudbury Métis Council

The Sudbury Métis Council is a member of Region 5 of the Métis Nation of Ontario. They have traditional territories in the lands surrounding the Projects; however, they are not signatories to the Robinson – Huron Treaty of 1850. They presently engage in hunting, fishing, trapping and harvesting activities in their traditional areas (Métis Nation of Ontario, 2013).

6.6.8.1. Summary of Current Engagement

The Community was contacted in April of 2011 by the Sudbury District office of the MNR to notify them that an application for Site Release had been made by Xeneca, and that site release would be occurring concurrently with an Environmental Assessment Process. Additionally this letter listed their community as a local community which potentially had interests in the Project.

On July 18, 2011 Xeneca provided the Community summary reports for the Stage I archaeological work that was completed on the Project site. They also invited the Community to participate in the stage II archeological field work which had yet to be scheduled.

In August 2011 Xeneca provided an Aboriginal Consultation Plan, for review and comment. On July 23, 2012 a revised Aboriginal Consultation Plan was provided to the Community which included federal revisions and additional communities resulting from federal consultations.

On October 12, 2011 the community was invited to a Public Information Centre (PIC) for the Project which was held on October 20, 2011 in Espanola.

On December 13, 2011 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project.

On July 12, 2012 the community was invited to a PIC for the Project which was held on July 25, 2012 in Espanola. At this time Xeneca also extended an offer to host a meeting specific to the Sudbury Métis Council.

In August of 2012 the Community was notified that as per the Stage two archaeological recommendations Xeneca would be choosing to avoid the significant archaeological find at the project site, and that further studies would not be completed at this time.

On October 30, 2012 Xeneca provided the Community with a copy of the "Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"dated August 2012 for the community's review and comment.

On April 11, 2013 Xeneca mailed the Community the Stage II Archaeological Report for review and comment.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

On July 16, 2013 Xeneca provided the Community with a copy of the final Notice of Commencement along with a copy of the Project Description for their records.

Table 21 – Sudbury Métis Council ER Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	July 16, 2013	Mr. Roger Giroux
Notice of Commencement	July 16, 2013	Mr. Roger Giroux
Draft Environmental Report	October 30, 2012	Mr. Roger Giroux
Updated Project Description	December 13, 2011	Mr. Roger Giroux

6.6.8.2. Current Status of Consultation and Engagement

Throughout this period Xeneca has engaged the Sudbury Métis Council directly and through the Métis Nation of Ontario. This engagement and consultation process is progressing towards a Memorandum of Understanding (MOU) on their behalf through the Métis Nation of Ontario. To date the community has not tabled any specific concerns related to aboriginal treaty rights, traditional lands or specific community issues. Based on a general understanding of the community's traditional and current use of the area, potential concerns for the community are listed in the impact and mitigation matrix in section 7. Consultation and engagement with this community will continue throughout the construction period, and into the lifecycle operations of the project.

6.6.9. United Chiefs and Councils of Mnidoo Mnising

The United Chiefs and Councils of Mnidoo Mnising are the Tribal Council responsible for providing programs and services to the Member Nations of: Aundeck Omni Kaning, Sheguiandah, M'Chigeeng, Whitefish River, Sheshewaning and Ziibaahaasing (United Chiefs & Councils of Mnidoo Mnising, 2013).

6.6.9.1. Summary of Engagement

The United Chiefs and Councils of Mnidoo Mnising was notified about the project on July 26 2012 when a formal letter was sent introducing the company, notifying the community of the project, the need for a Class EA process, the federal EA process, and providing an Aboriginal Consultation Plan. This letter provided contact information for Xeneca and invited the community to establish a time to meet with the company in the future to discuss the development.

On July 27, 2012 Xeneca provided the community package of information containing copies of several important project specific documents. The package included copies of all of the Notice of Commencements, along with past communications, and a Project Description.

In August of 2012 the Community was notified that as per the Stage II archaeological recommendations Xeneca would be choosing to avoid the significant archaeological find at the project site, and that further studies would not be completed at this time.

On October 30, 2012 Xeneca provided the Community with a copy of the *"Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"* dated August 2012 for the community's review and comment.

On November 5, 2012 Xeneca extended an invitation to the Community to participate in a meeting to discuss the Project. This meeting was multi-community coordination meeting which was to be attended by many First Nations groups which had interests in the Project in order to discuss the Environmental Assessment.

On November 9, 2012 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project.

On April 11, 2013 Xeneca provided the community with the Stage II Archaeological Report for their review and comment.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

Table 22 – UCCMM Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	September 5, 2012	United Chiefs and Councils of Mnidoo Mnising
Notice of Commencement	July 27, 2007	
Draft Environmental Report	October 30, 2012	United Chiefs and Councils of Mnidoo Mnising
Updated Project Description	November 9, 2012	United Chiefs and Councils of Mnidoo Mnising

6.6.9.2. Current Status of Consultation and Engagement

Throughout this Project Xeneca has continued to engage UCCMM on behalf of its member organizations. To date this Community has tabled some specific concerns related to aboriginal treaty rights, traditional lands and specific community concerns. These can be found in Table 23 below. Consultation and engagement with this Community will continue through the construction period, and into the lifecycle operations of the Project.

Table 23: UCCM Issues and Concerns Tracking Table

Issue / Concern Raised	Date Identified	Response on Record
Concerned over the accommodation of the First Nations in relation to the project.	13-Sep-12	A meeting was arranged in order to discuss concerns with all First Nation communities potentially impacted by the Project Development, including UCCMM. This meeting was held on November 13, 2012, during which time the issue of accommodation was discussed The meeting also discussed a strategy to determine how the group would collaborate on a joint review of the environmental assessment, archaeology and economic participation model.
Not informed of blasting happening at Wabagishik Rapids, requests that it be stopped until the Community understands what us being done.	30-Nov-12	Work was stopped immediately after concerns were raised. No more work has been completed. Follow up was completed with UCCMM and the two communities who also submitted complaints and commitments to submit proper advance notification and communication prior to commencement of the work in the future. The remaining work was deferred until the construction period.

6.6.10. Wahnapitae First Nation

Wahnapitae First Nation is a member of Waabnoon Bemjiwang Association of First Nations, and a signatory to the Robinson Huron Treaty of 1850. The Community holds a reserve on the north shore of Lake Wanapitei, and has a land claim in process to expand this reserve. Individuals from the Community own and operate businesses in the area including a licensed restaurant, and four camp/trailer/cottage areas. The Community is surrounded by resource development such as mining extraction and forestry. As a result they have developed a Community Development Plan

which focuses on priorities for the community. These include Economic Development, Watershed Management and Infrastructure (Wahnapitae First Nation, 2013).

6.6.10.1. Summary of Engagement

Wahnapitae First Nation was notified about the project in June 2010 when a formal letter was sent introducing the company, notifying the community of the project, the need for a Class EA process, and providing information related to the Site Release. This letter provided contact information for Xeneca and contact information for the MNR if any further information was required.

In October 2010, Xeneca sent a letter inviting the community to a preliminary Public Information Centre (PIC) on November 22 and 23, 2010. Due to unforeseen circumstances, this PIC was canceled and a formal letter notifying the community of this change was sent on October 25, 2010.

In September of 2010, Xeneca sent a letter inviting the community to participate in the archaeological studies at the project location. A follow up to this letter was sent on May 11, 2011 in which Xeneca provided the community summary reports for the Stage I archaeological work that was completed on the Project site. They also invited the Community to participate in the stage II archeological field work which had yet to be scheduled.

In December, 2010 the Class EA began in earnest and Xeneca sent the community a letter to notify them that this process had begun. This package included copies of the Draft Project Description for the Project.

On May 13, 2011 Xeneca provided the community a package of information containing copies of several important project specific documents. The package included copies of all of the Notice of Commencements, along with past communications, and a Project Description.

On July 26, 2012 an Aboriginal Consultation Plan was provided to the Community which included federal revisions and additional communities resulting from federal consultations.

On September 5, 2012 Xeneca sent the Community an additional copy of the Project Description to the new Chief.

On October 30, 2012 Xeneca provided the Community with a copy of the *"Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"* dated August 2012 for the community's review and comment.

On November 5, 2012 Xeneca extended an invitation to the Community to participate in a meeting to discuss the Project. This meeting was a multi-community coordination meeting which was to be attended by many First Nations groups which had interests in the Project in order to discuss the Environmental Assessment.

On November 9, 2012 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project.

On April 11, 2013 Xeneca sent the Community the Archaeological Stage II Report for Wabagishik Rapids for review and comment.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

Table 24 – Wahnapitae Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	May 13, 2011 & September 5, 2012	Chief Myles Tyson & Chief Ted Roque
Notice of Commencement	May 13, 2011	Chief Myles Tyson
Draft Environmental Report	October 30, 2012	Chief Ted Roque
Updated Project Description	November 9, 2012	Chief Ted Roque

6.6.10.2. Current Status of Consultation and Engagement

Throughout this period Xeneca has continued to engage Wahnapitae First Nation individually. To date the community has not tabled any specific concerns related to aboriginal treaty rights, traditional lands or specific community issues. Based on a general understanding of the community's traditional and current use of the area, potential concerns for the community are listed in the impact and mitigation matrix in section 7. Consultation and engagement with this community will continue throughout the construction period, and into the lifecycle operations of the project.

6.6.11. Whitefish Lake First Nation (Atikameksheng Anishnawbek)

Whitefish Lake First Nation is member of Mamaweswen The North Shore Tribal Council Secretariat and signatories to the Robison-Huron Treaty of 1850. They are located approximately 19km west of Sudbury (Atikameksheng Anishnawbek).

6.6.11.1. Summary of Engagement

Whitefish Lake First Nations was notified of the project on June 24, 2010 when a formal letter was sent introducing the company, notifying the community of the project, the need for a Class EA process, the federal EA process, and providing an Aboriginal Consultation Plan. This letter provided contact information for Xeneca and invited the community to establish a time to meet with the company in the future to discuss the development.

In September of 2010, Xeneca sent a letter inviting the community to participate in the archaeological studies at the project location. A follow up to this letter was sent on May 11, 2011 in which Xeneca provided the community summary reports for the Stage I archaeological work that was completed on the Project site. They also invited the Community to participate in the stage II archeological field work which had yet to be scheduled.

On October 13, 2010 Xeneca sent a letter inviting the community to attend Public Information Centres for the proposed projects. The community was notified again on October 25, 2010 that the Public Information Centres had been rescheduled.

In December, 2010 the Class EA began in earnest and Xeneca sent the community a letter to notify them that this process had begun. This package included copies of the Draft Project Description for the Project.

On May 13, 2011 Xeneca provided the community package of information containing copies of several important project specific documents. The package included copies of all of the Notice of Commencements, along with past communications, and a Project Description.

In August 2011 Xeneca provided an Aboriginal Consultation Plan, for review and comment.

On October 12, 2011 the community was invited to a Public Information Centre (PIC) for the Project which was held on October 20, 2011 in Espanola.

On December 13, 2011 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project

On July 12, 2012 the community was invited to a PIC for the Project which was held on July 25, 2012 in Espanola. At this time Xeneca also extended an offer to host a meeting specific to the Community.

On July 23, 2012 Xeneca sent a letter to the Community notifying them that the Class EA was nearing completion and requesting their input. A revised Draft Aboriginal Consultation Plan was sent to the community in this package.

In August of 2012 the Community was notified that as per the Stage II archaeological recommendations. Xeneca would be choosing to avoid the significant archaeological find at the project site, and that further studies would not be completed at this time.

On October 30, 2012 Xeneca provided the Community with a copy of the "Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)" dated August 2012 for the community's review and comment.

On November 5, 2012 Xeneca extended an invitation to the Community to participate in a meeting to discuss the Project. This meeting was a multi-community coordination meeting which was to be attended by many First Nations groups which had interests in the Project in order to discuss the Environmental Assessment.

On December 3, 2012, following complaints from the Community due to the geotechnical testing program, Xeneca's CEO issued a letter of apology to the Community for the disruption caused by geotechnical testing. Further meeting and discussion with the Community was requested. This was followed up by a meeting with the Chief in January 2013.

On March 22, 2013, Xeneca sent a letter to the Community requesting input on upcoming field studies. The Community was asked to indicate any interest they might have in participating in the process.

On June 17, 2013, Xeneca extended an invitation to the Community to participate in a field trip to the culturally significant Belmer site, although members of the Community ultimately were unable to attend.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

Table 25 – Whitefish Lake Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	December 20, 2012	Chief Edward Steven Miller
Notice of Commencement	May 13, 2011	Chief Edward Steven Miller
Draft Environmental Report	October 30, 2012	Chief Edward Steven Miller
Updated Project Description	December 13, 2011	Chief Edward Steven Miller

6.6.12. Current Status of Consultation and Engagement

Throughout this period Xeneca has continued to engage Whitefish Lake First Nation individually. To date this Community has tabled some specific concerns related to aboriginal treaty rights, traditional lands and specific community concerns. These can be found in Table 26 below. Based on a general understanding of the community's traditional and current use of the area, potential concerns for the community are listed in the impact and mitigation matrix in section 7. Consultation and engagement with this community will continue throughout the construction period, and into the lifecycle operations of the project.

Table 26: Whitefish Lake First Nation Issues and Concerns Tracking Table

Issue / Concern Raised	Date Identified	Response on Record
Concerns about the Vermillion, as community elders can recall the use of (the) river as an important travel corridor to Sagamok and the North Channel. And Bill C-45 (changes to navigable waters policy).	22-Jan-13	Xeneca has acknowledged that this project will impact the navigability of the waterway, and that this is an important travel corridor to local communities. In order to mitigate the effects of the structure, a portage route around the dam is planned. This portage route is described in Part B, Section 1.5 of the ***Wabageshik Rapids Hydro Project Construction Management Plan.*** During construction there will be a temporary portage route, the final portage route will be more direct. These two routes are shown on diagrams in the Construction Sequence Drawings in the ***Wabageshik Rapids Hydro Project Construction Management Plan: Annex II.***

6.6.13. Whitefish River First Nation

Whitefish River First Nation is a member of the United Chiefs & Councils of Mnidoo Mnising. This Community is located on the North Shore Channel of Manitoulin Island. Wildlife, lakes and rivers are important to the Community. Additionally the community is interested in business development opportunities within their traditional territory (Whitefish River First Nation).

6.6.13.1. Summary of Engagement

In September of 2010, Xeneca sent a letter inviting the community to participate in the archaeological studies at the project location. A follow up to this letter was sent on May 11, 2011 in which Xeneca provided the community summary reports for the Stage I archaeological work that was completed on the Project site. They also invited the Community to participate in the stage II archeological field work which had yet to be scheduled.

On October 13, 2010 Xeneca sent a letter inviting the community to attend Public Information Centres for the proposed projects. The community was notified again on October 25, 2010 that the Public Information Centres had been rescheduled.

In December, 2010 the Class EA began in earnest and Xeneca sent the community a letter to notify them that this process had begun. This package included copies of the Draft Project Description for the Project.

On May 13, 2011 Xeneca provided the community a package of information containing copies of several important project specific documents. The package included copies of all of the Notice of Commencements, along with past communications, and a Project Description.

In August 2011 Xeneca provided an Aboriginal Consultation Plan for review and comment. On July 23, 2012 a revised Aboriginal Consultation Plan was provided to the Community which included federal revisions and additional communities resulting from federal consultations.

On December 13, 2011 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project

On July 12, 2012 the community was invited to a PIC for the Project which was held on July 25, 2012 in Espanola. At this time Xeneca also extended an offer to host a meeting specific to the Community.

In August of 2012 the Community was notified that as per the Stage two archaeological recommendations Xeneca would be choosing to avoid the significant archaeological find at the project site, and that further studies would not be completed at this time.

On October 30, 2012 Xeneca provided the Community with a copy of the *"Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"* dated August 2012 for the community's review and comment.

On November 5, 2012 Xeneca extended an invitation to the Community to participate in a meeting to discuss the Project. This meeting was a multi-community coordination meeting which was to be attended by many First Nations groups which had interests in the Project in order to discuss the Environmental Assessment.

On February 27, 2013, Xeneca provided the Community with a letter notifying them of changes to the Canadian Environmental Assessment Act, and that the project would no longer require federal environmental assessment. The letter confirmed Xeneca's intent to continue to work proactively with the Community.

On March 25, 2013, Xeneca sent a letter to the Community requesting input on upcoming field studies. The Community was asked to indicate any interest they might have in participating in the process.

On April 11, 2013 Xeneca sent the Community the Archaeological Stage II Report for Wabagishik Rapids for review and comment along with an explanation of the archaeological study process.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

Table 27 – Whitefish River Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	December 20, 2010	Chief Franklin Paibomsai
Notice of Commencement	May 13, 2011	Chief Franklin Paibomsai
Draft Environmental Report	October 30, 2012	Chief Shining Turtle
Updated Project Description	December 13, 2011	Chief Shining Turtle

6.6.13.2. Current Status of Consultation and Engagement

Throughout this period Xeneca has continued to engage Whitefish River First Nation individually. To date this community has worked with a consultant to table several concerns and issues which can be found in the EA Peer Review Table in Section 6.6.15. Based on a general understanding of the community's traditional and current use of the area, potential concerns for the community are listed in the impact and mitigation matrix in section 7. Consultation and engagement with this community will continue throughout the construction period, and into the lifecycle operations of the project.

Table 28: Whitefish River Issues and Concerns Tracking Table

Issue / Concern Raised	Date Identified	Response on Record	Comments
Xeneca's Aboriginal Consultation Plan does not meet requirements under Canadian Law about the duty to consult and accommodate, does not met requirements of Anishinabe law and custom, and the Plan and the fact that it was unilaterally developed and imposed on us is disrespectful of WRFN. Calling for meeting with the community, representatives of Xeneca and MNR.	12-Sep-11	Xeneca's aboriginal consultation guide was drafted in order to assist and facilitate dialogue. It was drafted using guidance from the Provincial and Federal governments and in that regard meets the Duty to Consult in accordance with Canadian law.	Meetings were held with Whitefish River First Nation in follow up.
Provided protocol to meet with Water Keepers (delegation of women who carry spiritual connection to water and who work together for the protection of water, land, air and all living things).	18-Oct-12	Xeneca coordinated with the Water Keepers and arranged a field trip to the location and information meeting to create an understanding and awareness about the project and to listen to their issues and concerns. The meeting occurred in the summer of 2013 when there were less safety issues in travel to the remote site.	A group from Whitefish River and Sagamok Anishinabek traveled to the Wabagishik project (Belmer archaeology site). The Whitefish River Waterkeepers / Grandmothers performed water ceremony and blessing for the proposed project.

6.6.14. Wikwemikong Unceded Indian Reserve

Wikwemikong Unceded Indian Reserve is a member of the Union of Ontario Indians, and is not a signatory of to the Robinson-Huron Treaty of 1850. The Community is located on Manitoulin Island, and is responsible for providing a number of local services including housing, education and infrastructure services to its members. The reserve is one of the largest in Canada (Wikwemikong Unceded Indian Reserve, 2013).

6.6.14.1. Summary of Engagement

On May 11, 2011 Xeneca provided the community summary reports for the Stage I archaeological work that was completed on the Project site. They also invited the Community to participate in the stage II archeological field work which had yet to be scheduled.

On August 18, 2011 Xeneca provided the community with the Aboriginal Consultation Plan for their review and comment. On July 23, 2012 a revised Aboriginal Consultation Plan was provided to the Community which included federal revisions and additional communities resulting from federal consultations.

In September of 2011, Xeneca sent a letter inviting the community to participate in the archaeological studies at the project location.

On October 12, 2011 the community was invited to a Public Information Centre (PIC) for the Project which was held on October 20, 2011 in Espanola. On December 13, 2011 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project.

On July 12, 2012 the community was invited to a PIC for the Project which was held on July 25, 2012 in Espanola. At this time Xeneca also extended an offer to host a meeting specific to the Community.

In August of 2012 the Community was notified that as per the Stage II archaeological recommendations Xeneca would be choosing to avoid the significant archaeological find at the project site, and that further studies would not be completed at this time.

On October 30, 2012 Xeneca provided the Community with a copy of the "Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"dated August 2012 for the community's review and comment.

On November 5, 2012 Xeneca extended an invitation to the Community to participate in a meeting to discuss the Project. This meeting was multi-community coordination meeting which was to be attended by many First Nations groups which had interests in the Project in order to discuss the Environmental Assessment.

On April 11, 2013 Xeneca provided the Community with a copy of the Archaeological Stage II Assessment for their review and comment.

On July 15, 2013 Xeneca provided the Community with copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

On July 16, 2013 Xeneca provided the Community with a copy of the final Notice of Commencement along with a copy of the Project Description for their records.

On July 31, 2013 the Community issued a letter which stated "I am confident that Xeneca will take all measures to ensuring that the construction of these particular rapids are drafted with avoidance evaluations for sacred sites such as the Belmer site and also to mitigate the environmental degradation that is to occur in the development of the Wabagishik Rapids site."

Xeneca was invited by the community to set-up an information booth at a Trade Show held August 20, 2013. Xeneca participated in the event, answered questions about the project, and discussed potential employment opportunities with Community youth with respect to the construction and operation of the project.

Table 29 – Wikwemikong Unceded Indian Reserve Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	July 16, 2013	Chief Duke Peltier
Notice of Commencement	July 16, 2013	Chief Duke Peltier
Draft Environmental Report	October 30, 2012	Chief Duke Peltier
Updated Project Description	December 13, 2011	Chief Hazel Fox-Recollet

6.6.14.2. Current Status of Consultation and Engagement

Throughout this period Xeneca has continued to engage Wikwemikong Unceded Indian Reserve individually. To date the community has not tabled any specific concerns related to aboriginal treaty rights, traditional lands or specific community issues. Any concerns raised have been raised through the EA Peer Group and are reflected in the EA Peer Review Table in Section 6.6.15.

Based on a general understanding of the community's traditional and current use of the area, potential concerns for the community are listed in the impact and mitigation matrix in section 7. Consultation and engagement with this community will continue throughout the construction period, and into the lifecycle operations of the project.

6.6.15. First Nations EA Peer Review Group

In November 2012, Xeneca, with the assistance of several Aboriginal Communities convened an EA Peer Review Group which would assist the various communities in reviewing aspects of the Project development. In addition to reviewing the Environmental Assessment, this group would also take on review of business to business (B2B) items. The B2B discussion between Xeneca and Aboriginal Communities are not part of the EA process and are for the most part confidential, therefore they will not be discussed further in this document. For the purposes of the Class EA Sagamok Anishnawbek was appointed the lead for the Environmental Assessment review. The members of the EA Peer Review group agreed that within reason, and in some cases with Elder approval, what the lead group (Sagamok) concluded from their review, they would also generally endorse.

The EA Peer Review Group consists of the following communities:

- Aundeck-Omni-Kaning (Sucker Creek) First Nation
- M'Chigeeng First Nation
- Sagamok Anishnawbek
- Sheguiandah First Nation
- Wikwemikong Unceded Indian Reserve
- Whitefish River First Nation

Whitefish Lake First Nation (Atikameksheng Anishnawbek) was present at the November 5, 2012 coordination meeting for the EA Peer review group and have agreed with the idea in principle; however, they have remained independent from the group to date.

In early 2013, Sagamok Anishnawbek hired a third party consultant to assist them in reviewing the draft EA and associated documents, including the Stage II archaeological reports. In April of 2013, the third party consultant and Sagamok Anishnawbek presented Xeneca with the concerns and issues from their review of these documents. These can be found in Table 30 below. In a Meeting on April 24, 2013 Sagamok Anishnawbek, the third party consultant, and members of the EA Peer Review group held an open discussion on these issues in order to gain more clarity.

On June 20, 2013 the members some members from the EA Peer Review Group, Elders, Water Keepers and a Councillor from Sagamok, Xeneca, the third party consultant and Xeneca's archaeologist toured the project site and visited the culturally significant Belmer site. White Fish Lake First Nation (Atikameksheng Anishnawbek) and the United Chiefs & Councils of Mnidoo Mnising were invited but were unable to attend. The Water Keepers performed a Water Ceremony. This field visit was held in order to discuss issues related to the peer review. During the visit Xeneca answered questions about the design and operation of the site and the Belmer Site avoidance strategy. In follow up to this meeting those individual communities who were part of the EA Peer Review group who were unable to attend received a package of materials summarizing the Field Visit. Attending members also received this package.

Table 30 – EA Peer Review Issues and Concerns

Issue / Concern Raised	Date Identified	Response on Record
Lake Sturgeon - consultant has questioned whether the conclusion that there are not Lake Sturgeon upstream or in Wabagishik Lake is sound. Also, has questioned conclusions about Lake Sturgeon inability to move upstream through the rapids. There is a recommendation for broader field work / sampling and reconsideration of some of the conclusions drawn about upstream passage based on scientific literature that looks at fish behaviour in controlled versus natural environments.	22-Mar-13	Xeneca has completed extensive studies on the Vermillion River in the proposed Project area in 2011 and 2012 which provided no incidence of Lake Sturgeon. Further information from the district MNR staff and anecdotal data collected during the study period indicate that there are no Lake Sturgeon in the area. Additionally lake sturgeon would find upstream movement difficult because of the steep channel and fast flows. Xeneca has offered to work with UCCMM and First Nation Communities on restoration initiatives for Lake Sturgeon downstream of the Proposed Wabagishik Rapids Site.
Walleye - The consultants feel that a second year of study is required to determine potential impacts on this VEC.	22-Mar-13	Additional walleye studies were completed as part of the overall water management plan on the Vermillion River. Xeneca reviewed these studies as part of a comprehensive literature review which determined that a second year of study wasn't necessary as the results of this study showed similar data to the initial review.

Northern Pike - As above, more data on this VEC may be required to determine potential impacts.	22-Mar-13	Northern Pike habitat was not found to be present in the headpond upon investigation. Northern Pike habitat was found downstream and lake Wabagishik. A mitigation strategy in the operation plan seeks to minimize impact on Northern Pike spawning in the downstream areas, and the operation of the facility won't result in impacts to Northern Pike habitat in the lake.
Methyl Mercury Fish Tissue Sampling - Additional sampling is recommended, particularly with respect to Walleye and Northern Pike which were excluded from previous assessment.	22-Mar-13	Fish species were of the size and species composition requested by the Ministry of the Environment and this methodology is described in section 4 of the *Wabageshik Rapids Baseline Water Quality and Fish Report* prepared by Hutchison Environmental Services Ltd in June 2013. Baseline years studied include 2012 and 2013. (Annex IV, Surface Water Quality).
Turtle Survey - Consultants feel that a Turtle Survey is required as a result of desirable habitat (downstream and including for Blanding's) and the confirmed presence/observance of snapping turtle.	22-Mar-13	A survey for Blanding's Turtle and other turtles was completed in May and June 2013. This survey included an assessment of habitat and species presence. The survey found presences of turtles including snapping turtles, and painted turtles, however targeted surveys for Blanding's turtles did not result in any individuals. Mitigation measures for these species can be found in Table 11 of the *Wabageshik Baseline Environmental Conditions for Road Options* prepared by Northern Bioscience in June 2013 in Annex VI, Lines and Roads.
Transmission Lines / Roads - General observation that terrestrial field work and archaeological work have not been completed as the preferred route has not been selected.	22-Mar-13	The terrestrial field work was completed for the all the roads and lines options in May and June 2013. The results of this assessment can be found in the *Wabageshik Baseline Environmental Conditions for Road Options* prepared by Northern Bioscience (June 2013). The archaeological assessment for the lines and roads was completed July 2013. The results of this assessment can be found in the Stage I Archaeology Report Prepared by Woodland Heritage located in Annex V. The preferred route selection will be made as during the detailed design phase of the selection. Aboriginal consultation will continue during this phase.

Cultural Heritage / Belmer Site - This continues to be a concern for Sagamok and suspect will also be an area of focus for the other Communities. Our consultants have suggested that confirmation of the eastern boundary of the project site be provided. Also, there would need to be a determination by Luke DellaBona from Woodland Heritage whether there was need for a Stage II (archaeology assessment) for areas that are now within the project site, but may not have been included in the archaeological work done to date.	22-Mar-13	The Belmer Site is outside the project construction island. Construction fencing will be erected demarking the eastern boundary of the site. This will include a fence 70m from the boundary area preventing staff from entering the site. An avoidance strategy letter has been submitted to MTCS showing the fences during construction and the rationale of no impacts to the Belmer site. Additional archaeology work has been completed for remainder of project areas, including construction lay down areas, all access roads, and transmission lines which concluded that there would be no anticipated impacts from the Project activities with relation to archaeological values.
Operational Plan - clarification with DFO and MNR - once clarified a few other issues identified in the Senes report may be resolved.	22-Mar-13	Xeneca has reached consensus with the Agencies (MNR, MOE and DFO) on the operating plan of the project including minimum environmental flows and compensatory flows. Please refer the *Proposed Operating Plan & Water Management Plan Amendment Wabageshik Rapid Small Waterpower Project* which was updated on July 2013 for further information. (Annex I).
Fish entrainment and impingement and mitigation strategies - our consultant has raised some issues in this area, but they are items for discussion between Xeneca and the FNs (and consultants) and do not require further field work.	22-Mar-13	More information can be found in the in Section 6.6 of the updated *Wabageshik Rapids Hydroelectric Generating Station Project: Natural Environment Characterization and Impact Assessment Report* (July 2013) prepared by NRSI (Annex III) which has been updated from the previous version. This matter was discussed with the MNR and turbines with blade designs which prevent entrainment and impingement will be utilized. Monitoring will occur post construction and should it find that mitigation measures are not effective the intake will be further modified to prevent or reduce entrainment and impingement including provision lighting, electrical barriers, air bubbling and sound barriers.
There is reported to be a lack of information on the actual area of inundation, which also may affect some of the findings, conclusions and	22-Mar-13	The area of inundation was updated on July 2013 and is described in Operating Plan prepared by ORTECH. Discussions have been held with MNR and MOE to confirm the inundation. This information is

recommendations.		also included in Section 5, Operating Strategy of the ER.
Spawning habitat loss - we understand that this has not been calculated yet, and that discussions may be underway with DFO and MNR.	22-Mar-13	Areas requiring habitat compensation are outlined in *Wabageshik Rapids Hydroelectric Generating Station Project Preliminary Fish Habitat Compensation Plan* (July 2013) prepared by NRSI located in Annex III.
Important findings from many of the supporting studies and reports are not summarized in the main ER document.	10-Apr-13	This has been corrected in the final report.
The draft ER provides a limited discussion of potential environmental effects.	10-Apr-13	We have strengthened the effects/mitigation tables to provide greater information.
There were several components of the environment that were only minimally assessed.	10-Apr-13	We have expanded environmental reviews and descriptions for the final report.
Some important aspects of the Project have not been resolved or assessed and are apparently (and it is not entirely clear) that will be deferred into a post environmental assessment pre-construction stage.	10-Apr-13	For the final version of the report Xeneca has taken care to include all Project components in its site assessment.
There are some important findings and mitigation measures identified in the supporting documents but it is not fully clear whether such measures will be implemented.	10-Apr-13	Xeneca is fully committed to the mitigation and monitoring as described in the ER text, and is bound by them as required under provincial and federal law as described in the Environmental Protection Act, the Environmental Assessment Act and all associated Regulations, policies and programs.
We would recommend that Sagamok remain involved with the environmental assessment process (and later stages) while the Proposed Project continues to evolve.	10-Apr-13	Xeneca intends to continue to keep Sagamok and all potentially impacted aboriginal communities involved during the environmental assessment process, as well as throughout the construction and operation periods of the Project.
It is recommended that in subsequent consultation between Sagamok and Xeneca that the two transmission route options be prominently mapped for inspection by community resource users.	10-Apr-13	Final transmission routes have been presented in the *Power Line and Road Summary for Wabagishik Rapids Hydroelectric Project (Vermillion River)* prepared by KBM Resources Group (July 2013).

It is recommended that in subsequent consultation between Sagamok and Xeneca that the two (access road) routes be prominently mapped for inspection by community resource users. It may make most sense to hold these sessions after Xeneca has completed the 2013 field work.	10-Apr-13	Final access routes have been presented in the *Power Line and Road Summary for Wabagishik Rapids Hydroelectric Project (Vermillion River)* prepared by KBM Resources Group (July 2013).
It is recommended that the ER and associated documents be updated to reflect that Xeneca will undertake the Project according to [the Ontario Waterpower Association] Best Management Practices.	10-Apr-13	The Ontario Waterpower Association Best Management Practices guidelines will be integrated into the documentation prepared in support of permitting applications and adhered to through construction.
Under Fish Habitat in Table 5 (no page number) of the ER it is indicated that the Construction Management Plan will be revised. It is recommended that that Plan be revised based on the Final ER and all subsequent permits and approvals work including additional studies.	10-Apr-13	The recommendation is appreciated. The construction management plan used at the time of construction will include all mitigation, monitoring and constraints developed as part of the final ER. It should also be noted that the Construction Management Plan will be updated and shared with agencies for future permitting discussions.
Assuming Xeneca, MNR and DFO come to an agreement on where suitable replacement (spawning) habitat will be put it is recommended that post-construction monitoring be required to ensure the fish are actually using the new habitat.	10-Apr-13	A proposed habitat compensation plan has been provided for review and comment in the final ER. This plan includes a monitoring component to measure success of the plan. Further information can be found in the Wabageshik Rapids Hydroelectric Generating Station Project Preliminary Fish Habitat Compensation Plan (July 2013) prepared by NRSI located in Annex III.
Xeneca should include an assessment of impingement and entrainment as part of this review and discuss potential mitigation strategies that use current fish protection systems and methodologies given the concern with Lake Sturgeon. Xeneca should feel free to discuss the costs and benefits of such mitigations.	10-Apr-13	More information can be found in the in Section 6.6 of the updated *Wabageshik Rapids Hydroelectric Generating Station Project: Natural Environment Characterization and Impact Assessment Report* (July 2013) prepared by NRSI (Annex III) which has been updated from the previous version. This matter was discussed with the MNR and turbines with blade designs which prevent entrainment and impingement will be utilized. Monitoring will occur post construction and should it find that mitigation measures are not effective the intake will be further modified to prevent or reduce entrainment and

		impingement including provision lighting, electrical barriers, air bubbling and sound barriers.
Xeneca should be more cautious in their statement that it is unlikely that Lake Sturgeon can ascend Wabagishik Rapids during the elevated flows of a typical spring based on swimming speed data presented. As mentioned above, these lab based speed information may not reflect true performance of fish in the field based on US evidence. Furthermore, Lake Sturgeon can possibly pass through the rapids during the summer when the velocities are reduced.	10-Apr-13	The detailed work done on the system found that there are no lake sturgeon present above Wabagishik Rapids, therefore there is no risk of impingement. Furthered the use of low mortality turbines in order to reduce impingement on the system has been approved by the MNR. Monitoring will occur post construction in order to ensure that mitigation measures are effective. Should impingement be found to be occurring of any fish species, further mitigation will occuring including provision lighting, electrical barriers, air bubbling and sound barriers.
Xeneca should also be more cautious in their statement that "installation of a dam that lacks provision for fish passage will not adversely affect the management of fisheries resources." This may not be correct if a species is migratory based on recent findings with American eel (Hitt et al. 2012).	10-Apr-13	There was no evidence that lake sturgeon currently migrate above Wabageshik Rapids in the baseline studies performed at the Project site. Based on this information the construction and operation of the Project is being completed for those species identified.
The least environmental impact would occur during the more natural run-of-river operating mode. The proposed plan by Xeneca suggests that the facility will use the modified "run-of-river" operating mode most of the time. However, it should be recognized that intermittent peaking is likely very important to the economic feasibility of the Project.	10-Apr-13	The facility will generally operate in modified peaking mode, however the operations plan identifies several periods of the year during which run of river operations will be undertaken to mitigate effects (ie. upon fish spawning). The operations plan can be found in Annex 1.
It is recommended that additional sampling for total and methyl mercury be completed as soon as possible to establish a useful baseline.	10-Apr-13	Baseline data for Methyl Mercury was collected as part of the water quality monitoring program. The methodology for which is described in section 4 of the *Wabageshik Rapids Baseline Water Quality and Fish Report* prepared by Hutchison Environmental Services Ltd in June 2013. (Annex IV)This sampling was completed in accordance with the Ministry of the Environment's water quality guidelines. Baseline years include 2012 and 2013. Additional pre-

		construction baseline data will be conducted in 2013; post development monitoring will include methyl mercury.
It would be expected that a site-specific erosion and sedimentation control plan would be developed following the EA but prior to the initiation of construction.	10-Apr-13	A study was commissioned in spring 2013 to asses erosion and sedimentation this study will inform the development of a site specific erosion and sedimentation control plan during the detailed design phase of the Project. Further information can be found in the *Vermilion River Hydroelectric Project Geomorphic Assessment Wabagishik Rapids* (June 2013) report prepared by Parish geomorphic.(Annex I, Section 5).
Xeneca has committed to a three year surface water quality sampling program subsequent to the facility being commissioned (p. 139). Methyl mercury sampling in water should also be included as one of the parameters measured at multiple sampling locations.	10-Apr-13	Methyl mercury sampling in water measured at multiple sampling locations is a part of the post development sampling program. Samples will be collected upstream of the facility, within the impoundment and downstream of the facility. Further information on sampling locations can be found in section 4 of the *Wabageshik Rapids Baseline Water Quality and Fish Report* prepared by Hutchison Environmental Services Ltd in June 2013. (Annex IV).
It appears that no site specific geotechnical or soil information was collected.	10-Apr-13	Seismic geophysical investigation of the project site was done in late 2012, which provides sufficient information about bedrock profile and overburden thickness. Further geotechnical investigation including drilling and other test will be completed before the detailed design of the project.
With respect to vegetation no significant vegetation species were identified and a detailed plant list is provided in Appendix V of the NRSI Report. It is possible that Sagamok or other First Nation members may use the area for local plant collection. Sagamok could request from Xeneca their entire plant list for two basic forest types to see if there are any plants of concern to community members.	10-Apr-13	The list is provided in the Appendix V of the NRSI Report which was provided for the community to review. This list can be found in the Final ER in in Annex III (Appendices).

The ER report and supporting documentation seems incomplete. Therefore it would be preferable to complete the turtle survey prior to the completion of the final Environment Report.	10-Apr-13	The ER Report has been updated to include more complete information. A turtle survey was completed in May and June 2013. It found presence of painted and snapping turtles in the study area, however targeted surveys for Blanding's turtles did not result in any individuals. Mitigation measures for these species can be found in Table 11 of the *Wabageshik Baseline Environmental Conditions for Road Options* prepared by Northern Bioscience in June 2013 located in Annex VI.
The selection of the preferred transmission route and road option may be something that is of interest to Sagamok members whether it be from the perspective of allowing for or discouraging access. It is recommended that Sagamok request from Xeneca field visit tours of the transmission line and roads options.	10-Apr-13	The preferred transmission and access route options will be selected in the detailed design phase of the project. Interested parties are encouraged to submit comments on the proposed routes during the EA consultation period, however should the aboriginal communities wish to provide input on the selection of the preferred routing, they should do so during the detailed design phase of the Project.
It [is] necessary for the archaeologist to clearly define the eastern perimeter of the Belmer site so it is not impacted by Project construction.	10-Apr-13	The eastern perimeter of the Belmer site has been clearly defined and an avoidance strategy has been proposed in the ER in order to preventing construction personnel from entering the site. An avoidance strategy letter has been submitted to MTCS showing the fences during construction and the rationale of no impacts to the Belmer site. This avoidance strategy can be found in Annex V.
Given the Belmer Site's close proximity to the River it is recommended that Xeneca provide a presentation to Sagamok FN on how the site can and would be protected from any impacts associated with the Project. This should include representation from both Xeneca and the consulting archaeologist Luke DellaBona. In reality this recommendation was essentially mandated by the Stage 2 report and by the MTCS in terms of consultation requirements.	10-Apr-13	On June 20th, 2013 Xeneca toured the site with representatives from the EA Peer review group in order to examine the site and to provide information on the Project layout and to provide information on the setback provisions in reference to the Belmer site.

It should also be noted that it is likely stage 2 work has not been completed on the road and transmission corridors proposed for the Project, therefore this work is still required. Sagamok should obtain clarity from Xeneca about when this work will occur.	10-Apr-13	Archaeological work was completed on the lines and roads in July 2013. This work was submitted to MTCS for review. This report can be found in Annex V.
There is no documentation that Xeneca or Woodland Heritage has asked Sagamok if there may be identified native values in or near the site.	10-Apr-13	Xeneca inquired with regards to Aboriginal heritage and native values at the project site in informal meetings.
It is not clear whether the whole Project is $17 million or whether the expenditure in Ontario is $17 million.	10-Apr-13	27 million total, 8.5 million is Ontario only. This figure has been updated in the ER text as well.
In the draft ER Xeneca has indicated that local operators could be contacted to handle the forest harvest and brush clearing. This may be a contract Sagamok may wish to pursue. Sagamok may wish to make a request to Xeneca that the non-merchantable timber be made available for community fuel wood purposes or non-timber forest products.	10-Apr-13	Xeneca will work with aboriginal groups in order to identify job opportunities during the construction and operation periods.
It is recommended that the workforce not be allowed to fish and hunt at the site during the duration of the Project. It is also recommended that they are not allowed to bring and/or utilize ATVs and snowmobiles in the area.	10-Apr-13	Workers at the camp will not be permitted to hunt and fish. ATV and snowmobile use may be required on site but will be minimized to reduce noise impacts and will not be used for recreational purposes. This requirement will be included in the contract scope of work.
No drawings or maps have been provided that outline the area where public access will be prevented. It is therefore recommended that Sagamok request from Xeneca where public access will not be allowed	10-Apr-13	Presently there are no plans to have restrict access to the area permanently with the exception to the area surrounding the powerhouse. During the construction period access will be restricted temporarily on a rotating basis depending on the construction phase. Public input will inform the ongoing management of public access to the surrounding areas.

Should the project move forward it is recommended that Sagamok and Xeneca work together on where public access restrictions would occur.		Presently there are no plans to have restrict access to the area permanently with the exception to the area surrounding the powerhouse. During the construction period access will be restricted temporarily on a rotating basis depending on the construction phase. Input from Sagamok is welcome in helping to inform the ongoing management of the access to the surrounding areas.
It is recommended that the list of monitoring and follow up programs in Chapter 8 be updated at the time of completion of the final ER to include all monitoring and follow-up programs.	10-Apr-13	Considerable effort has been placed in updating these documents with review and input from MNR and DFO.
The ER in table 5 under Erosion and Sedimentation identifies a mitigation measure to be the "planting of vegetative cover will then follow in the next growing season." The planting of vegetation is intended to promote the stability of the soils and avoid erosion and sedimentation. It is recommended that only native plants be used. The vegetative cover could also involve small tree plant in the area. MNR may be able to suggest a seeding mix which it typically uses for restoring landing areas and old road beds.	10-Apr-13	This comment has been noted. It is intended that all restorative replanting will utilized native plantings and be completed under district MNR advisement and following SFL and Aboriginal community discussions.
The draft ER in Table 5 also under Erosion and Sedimentation indicates a possible commitment with respect to the monitoring of erosion in Years 1 and 3 following construction. It should be indicated whether these are firm commitments.	10-Apr-13	Xeneca understands that commitments made with regards to mitigation and monitoring in the ER are binding, and therefore any reference to monitoring, such as in Table 5 for Erosion and Sedimentation are firm.
While it is not likely that workers will be accommodated at the site itself, Xeneca should make a commitment that the workers associated with the Project will not be housed in temporary accommodations at the	10-Apr-13	There will be no on site construction camp, all workers will be housed off-site and bused in daily.

GS site during construction.		
Xeneca should include an assessment of impingement and entrainment as part of this review and discuss potential mitigation strategies that use current fish protection systems and methodologies given the concern with Lake Sturgeon.		more information can be found in the in Section 6.6 of the updated *Wabageshik Rapids Hydroelectric Generating Station Project: Natural Environment Characterization and Impact Assessment Report* (July 2013) prepared by NRSI (Annex III) which has been updated from the previous version. This matter was discussed with the MNR and turbines with blade designs which prevent entrainment and impingement will be utilized. Monitoring will occur post construction and should it find that mitigation measures are not effective, the intake will be further modified to prevent or reduce entrainment and impingement including provision lighting, electrical barriers, air bubbling and sound barriers. Lake Sturgeon were not considered in this assessment as they were not found to be present on the site.
The Belmer site avoidance plan was not included in the draft EA package and needs to be sent to the First Nations.	24-Apr-13	Avoidance plan was sent out to the First Nations on July 15, 2013.
A question was asked about the fence and locations.	24-Apr-13	There will be some temporary construction fencing located on the Project site in order to minimize hazards to the natural environment and to the public during construction activities. There will also be some fencing to protect natural features such as the culturally significant Belmer site. These fencing details can be found in the ER in Section 3.5 and in the Construction Management Plan in Annex II. Permanent fencing will be minimized at the Project site to allow for public access where possible. Fencing will only be used where required to protect the public from hazardous areas. Details of this can be found in the Construction Management Plan.
A question was asked about the existence of historical trails / portages.	24-Apr-13	Historical trails and portages were considered during the archaeological review, which can be found in Annex V.
When did the altered plans take effect compared to the archaeological study?	24-Apr-13	Xeneca decided to proceed with an avoidance plan instead of a Stage III archaeological Assessment in August of 2012. The final avoidance plan was prepared and reviewed by MTCS throughout late 2012 and early 2013.

First Nations need better maps to show all the information and greater details (e.g. navigation routes). The sites have other values as a natural setting to be shared with other people. Natural settings are vital and unobstructed passage (no fencing) to allow canoe portage is recommended. Opportunity and education about the natural environment is a high priority.	24-Apr-13	The final ER includes updated mapping which shows details with regards to the sites natural features and proposed structures. The Project Site will allow for existing canoe passage. A Portage route will be constructed as part of the effort to allow for unobstructed passage. This portage route is described in Part B, Section 1.5 of the Wabageshik Rapids Hydro Project Construction Management Plan in Annex II. During construction there will be a temporary portage route, the final portage route will be more direct. These two routes are shown on diagrams in the Construction Sequence Drawings in the Wabageshik Rapids Hydro Project Construction Management Plan: Annex II.
There is no comparison documenting First Nation values mapping and project plans (see presentation points). Trap lines is an example of values that can be examined.	24-Apr-13	A map was provided as an attachment to Xeneca's May 27, 2013 letter. Xeneca would also like to note that any known values mapping within 250 meters on either side of the route be considered an area of potential impact. If Xeneca becomes aware of these locations, Xeneca endeavored to avoid these sites and/or enter into further discussions if an impact could not be avoided.
Xeneca is not looking at cumulative effects or fish passage.	24-Apr-13	Xeneca has considered and looked at the cumulative effect of inserting another dam into the Spanish/Vermillion system. The potential for cumulative effect exists because three dams already exist upstream and downstream of the proposed Project (i.e. the Nairn Dam on the Spanish River coming in from the north, the Lorne Falls Dam upstream of Wabagishik Lake on the Vermillion River and the Domtar Dam downstream of the Spanish/Vermillion confluence). Fish study information shows that the proposed Project site in Wabagishik Rapids is likely not passable by Sturgeon and no Sturgeon have been found upstream between the proposed Project site and the Lorne Falls dam. The study results suggest that the proposed project will not further fragment Sturgeon movement in the system. In addition and to address any questions about possible uncertainty related to the study results, Xeneca has committed to

		work with First Nation communities on a sturgeon restoration initiative for the area. The initiative is geared at improving the existing conditions for sturgeon, rather than mitigating specific project impacts (as none are anticipated). A possible Sturgeon fish hatchery is being discussed and Xeneca has committed to support this initiative if stakeholders wish to pursue if further. Detailed information on fish passage and study results can be found in Sections 6 and 7 of the ER report and Annex III. The study information suggests that the proposed Projects are not likely to have a significant cumulative effect on habitat fragmentation. However, to account for uncertainty in the interpretation of the results, Xeneca has committed to support a Walleye hatchery operation as proposed by a key stakeholder group. The hatchery will help address the existing condition of heavy fishing pressures on the prevailing Walleye population. In summary, the potential for cumulative effects resulting from habitat fragmentation was carefully assessed and addressed.
What are the capacities (MW) of the other projects?	24-Apr-13	Wabagishik is 3.2 MW. Upper Vermillion is 8.7 total (At Soo Crossing 4.0, Cascade Falls 4 – 4.3, McPherson 2.2 (discontinued)).
Are there any plants of interest/significance in the area?	24-Apr-13	The NRSI's effects report included a review of VECs and Species at Risk in the Project Area. Updated versions of this report can be found in Annex III.
Was there any involvement/discussion with the Anishinabek/Ontario Fisheries Research Centre (A/OFRC)?	24-Apr-13	MNR (as partner to the A/OFRC) is aware of the study.
A case was made for sturgeon being able to navigate the rapids in the summer period. There are too many unknowns and Xeneca should take a conservative approach and consider that sturgeon could be there (Wabagishik Lake).	24-Apr-13	Xeneca has completed extensive studies on the Vermillion River in the proposed Project area in 2011 and 2012 which provided no incidence of Lake Sturgeon. Further information from the district MNR staff and anecdotal data collected during the study period indicate that there are no Lake Sturgeon in the area. Additionally lake sturgeon would find upstream

		movement difficult because of the steep channel and fast flows. Xeneca has offered to work with UCCMM and First Nation Communities on restoration initiatives for Lake Sturgeon downstream of the Proposed Wabagishik Rapids Site.
It is recommended that a larval drift study be undertaken.	24-Apr-13	In discussions with the First Nation communities, it was recognized that there was a weakness to the larval drift study and that the window to conduct this already passed by the time a scope of work could be put together. It was therefore recommended and agreed to by the First Nation communities that a larval drift study in 2013 would be of little value. Instead, Xeneca offered to conduct an extensive telemetry study recognizing that this would entail significant handling of the Lake Sturgeon population. While this was appreciated by the FNs, this was also not an approach which they wanted to undertake. Instead, discussions shifted to restoration and enhancing existing known habitat downstream.
A copy of the Operation Plan was requested.	24-Apr-13	This was provided to Sagamok directly on August 23, 2013.
There should be First Nation involvement in the review of the operations plan/report.	24-Apr-13	First Nations were provided with a copy of the Draft ER, including the operations plan report. Upon request of First Nations, an independent consultant was retained by the EA Peer Review Group to review the Draft ER and paid for by Xeneca. The review comments where then discussed among the parties. Questions and comments about various aspects of the Draft ER were discussed and followed up on. At this time, there does not appear to be any outstanding FN issue on the operations plan that Xeneca is aware of.

Can juvenile sturgeon navigate the rapids?	24-Apr-13	Xeneca has considered juvenile sturgeon navigation of the rapids in the Fish Study work completed and the potential for upstream passage appears limited. No sturgeon presence has been reported upstream and none was revealed in the fish studies. Hydraulic analysis in Wabagishik Rapids shows that flow velocities are too high most of the time for sturgeon passage to occur (i.e. some occasional passage might be conceivable but not likely given the absence of sturgeon upstream). Based on this information it seems extremely unlikely that juvenile sturgeon go upstream of Wabagishik Rapids. In addition and to address any questions about possible uncertainty related to the study results, Xeneca has committed to work with First Nation communities on a sturgeon restoration initiative for the area. The initiative is geared at improving the existing conditions for sturgeon downstream, rather than mitigating specific project impacts (as none are anticipated). A possible Sturgeon fish hatchery has being discussed and Xeneca has committed to support this initiative if the First Nation Communities wish to pursue it further. Further information on sturgeon can be found in Section 2.11.6 (Fishing), 7.1.3, and in Annex III.
When is the NO GO date?	24-Apr-13	October 15, 2015.
Issues with Walleye and Northern Pike.	24-Apr-13	Walleye and Northern Pike were surveyed extensively as part of the fisheries studies carried out at the Project Site, the results, impacts and mitigation strategies can be found in Annex III and in Section 7 of the report.

Why did NRSI chose small mouth bass instead of walleye for mercury tissue sampling? It was recommended to use walleye because of the retention. Is total inorganic mercury or methyl mercury being studied in water and in fish? First Nations suggested that Xeneca consider completing additional testing/sampling for baseline mercury conditions in the water, including both total and methyl mercury.	24-Apr-13	Fish species were of the size and species composition requested by the Ministry of the Environment and this methodology is described in section 4 of the *Wabageshik Rapids Baseline Water Quality and Fish Report* prepared by Hutchison Environmental Services Ltd in June 2013 (Annex IV). Baseline years studied include 2012 and 2013.
A recommendation was made to measure small fish for future testing.	24-Apr-13	Fish species were of the size and species composition requested by the Ministry of the Environment and this methodology is described in section 4 of the *Wabageshik Rapids Baseline Water Quality and Fish Report* prepared by Hutchison Environmental Services Ltd in June 2013 (Annex IV). Baseline years studied include 2012 and 2013.
It was recommended that Xeneca provide a large and detailed map showing the transmission lines / roads. Xeneca can send electronic maps (on CD) to communities who have GIS systems.	24-Apr-13	A map showing the potential routes that would be studied was provided as an attachment to Xeneca's May 27, 2013 letter.
Concerns were raised about the lack of a turtle survey (in particular, Blanding's as a species-at-risk).	24-Apr-13	The ER Report has been updated to include more complete information. A turtle survey was completed in May and June 2013, it found presence of painted and snapping turtles in the study area however targeted surveys for Blanding's turtles did not result in any individuals. Mitigation measures for these species can be found in Table 11 of the *Wabageshik Baseline Environmental Conditions for Road Options* prepared by Northern Bioscience in June 2013 (Annex VI).

6.7. ADDITIONAL CONSULTATION COMMUNITIES

6.7.1. Métis Nation of Ontario

The Métis Nation of Ontario (MNO) provides a host of services to all Métis individuals in Métis Nation communities and Regions in Ontario.

Xeneca is working with the MNO through their Lands, Resources and Consultation Branch collaboratively in order to establish a consultation protocol that will involve regional meetings and will include opportunities for review and input on project developments by representatives from the Timmins Community Council, and any other interested Community Councils. The MNO has provided their consultation protocol to Xeneca with the intent that it be used as a model to develop a consultation process and aid in the implementation of an MOU that addresses capacity and accommodation requirements between the two parties.

As part of the consultation strategy, any written correspondence materials provided to Community Councils were also copied to the MNO for their information purposes.

6.7.1.1. Summary of Engagement

The Métis Nation of Ontario (MNO) was notified about the project on June 10, 2010 when a formal letter was sent introducing the company, notifying the community of the Project, the need for a Class EA process, and inviting the MNO to engage in upcoming Class EA related discussion.

On October 10, 2010, at the request of Xeneca, the MNO sent Xeneca a letter of support for Xeneca's decision to issue Notice of Commencement on eighteen of its projects, including the Wabagishik generating station.

In October 2010, Xeneca sent a letter inviting the community to a preliminary Public Information Centre (PIC) on November 22 and 23, 2010. Due to unforeseen circumstances, this PIC was canceled and a formal letter notifying the community of this change was sent on October 25, 2010.

On May 13, 2011 Xeneca provided the community a package of information containing copies of several important project specific documents. The package included copies of all of the Notice of Commencements, along with past communications, and a Project Description. A copy of Xeneca's draft Aboriginal Consultation Plan was also included.

On June 18, 2011, Xeneca provided the Community with a copy of the Stage I archaeological report, as well as notification of upcoming Stage II and III archaeological field studies. The Community was invited to participate in the field work.

On August 18, 2011, Xeneca provided the Community with notice that that the Class EA process was now being completed via a formal letter. The letter also included a copy of the Draft Aboriginal Consultation Plan for review and comment.

On October 12, 2011 the community was invited to a Public Information Centre (PIC) for the Project which was held on October 20, 2011 in Espanola.

On December 13, 2011 Xeneca provided the Community with an updated Project Description which outlined changes to the Project Site Location and Layout, additions to the aboriginal communities being consulted, and changes to the distribution line routing for the project.

On January 19, 2012 Xeneca provided the Community with an electronic copy of the updated Project Description, including a copy showing the changes made from the previous version.

On July 12, 2012 the community was invited to a PIC for the Project which was held on July 25, 2012 in Espanola. At this time Xeneca also extended an offer to host a meeting specific to the Community.

On July 23, 2012 Xeneca sent a letter to the Community notifying them that the Class EA was nearing completion and requesting their input. A revised Draft Aboriginal Consultation Plan was sent to the community in this package.

On September 21, 2012 Xeneca met with the Community to discuss a consultation approach, and the provision of GIS information. Wabageishik was identified as one of ten priority projects (ready to go first) in terms of potential impacts.

On October 30, 2012 Xeneca provided the Community with a copy of the *"Draft for Discussion Purposes Environmental Report Wabagishik Rapids (Vermilion River) Hydroelectric Generating Station Project)"* dated August 2012 for the community's review and comment.

On December 18, 2012 Xeneca provided the Community with electronic copies of several documents for priority projects, including project descriptions, baseline reports, cover letters, PIC panels, and draft environmental reports.

In January and February of 2013 Xeneca met twice with the MNO to discuss the Project. This discussion focused on obtaining an MOU with the Community which would advance consultation with the Community Councils. Additional topics discussed include: archaeology,

project siting, issues raised by other first nations, fish passage, additional studies, impact & mitigation, and traditional knowledge studies.

On July 15, 2013 Xeneca provided the Community with a copy of their avoidance plan for the culturally significant Belmer site for the Community's review and comment.

Table 31 – Métis Nation of Ontario ER Milestone Dates Summary

Milestone	Delivery Date	Delivered to
Project Description	May 13, 2011	Melanie Paradis
Notice of Commencement	May 13, 2011	Melanie Paradis
Draft Environmental Report	October 30, 2012	Mark Bowler
Updated Project Description	January 19, 2012	Melanie Paradis

6.7.1.2. Current Status of Consultation and Engagement

Throughout this period Xeneca has continued to engage MNO individually. To date this Community has tabled some specific concerns related to Community rights, traditional lands and specific community concerns. These can be found in Table 32 below. Based on a general understanding of the community's traditional and current use of the area, potential concerns for the community are listed in the impact and mitigation matrix in section 7. Consultation and engagement with this community will continue throughout the construction period, and into the lifecycle operations of the project. Xeneca is progressing towards an MOU with the MNO and the Regions associated with the Project.

Table 32: MNO Issues and Concerns Tracking Table

Issue / Concern Raised	Date Identified	Response on Record
MNO is concerned about the speed at which Xeneca needs to work. Digital files can be sent using FTP sites. Bi-elections could affect the Vermillion projects because there is time needed to get the committees up to speed.	21-Sep-12	Xeneca will make electronic copies of its Final ER documents available on FTP sites. Hard Copies will be provided upon request.
Concerns about Education, Training, and jobs.	21-Sep-12	At the appropriate time when the FN communities are prepared to discuss economic benefits on this project, Xeneca is prepared to incorporate into its Term Sheets and definitive legal agreements opportunities to benefit both in terms of equity in the projects, as well as contracting, jobs and initiatives to enhance capacity within the FN communities.
What is Ecologo certification?	11-Jan-13	It is a fee based industry standard and auditing system. Xeneca is striving to achieve the Ecologo industry imposed standard.
Who are Xeneca's Archaeologists?	11-Jan-13	Woodland Heritage Services.
There are concerns about the archaeology studies and the details of the area and activity that are categorized as First Nation but could be high potential for Métis activity (Métis activity has existed in the area since the 1600s). Concerns were also explained that archaeology guidelines were developed prior to the Powley Supreme Court of Canada decision. The MNO	11-Jan-13	Archaeology reports were provided to the MNO for their review and comment, they were also provided to the individual community councils for their individual review. In undertaking the archaeological assessment when evidence of human history is encountered all available knowledge is used to ascribe meaning to that information and place it within the framework of Ontario's history. Xeneca's archaeologist's activities are not exclusive to First Nations or Colonial history of Ontario and are inclusive of all people who left a mark on Ontario's past including Métis.

do not have an archaeologist but have a process to review reports. The MNO need to have confidence and comfort when dealing with developers in order to provide meaningful dialogue and review.		All fieldwork and reporting follows the Standards and Guidelines as prescribed by the Government of Ontario. If the Métis have concerns about the quality or standards of archaeology that exist in Ontario, they should voice those concerns to MTCS.
Does Xeneca manage its developments on a project by project basis or does it bundle the efforts (consultation)?	11-Jan-13	Xeneca works with communities on a river system approach with the objective that attempts to fit with the traditional territories.
How many projects could be developed within the territory?	11-Jan-13	One project (Wabagishik) is proceeding at the present time on the Vermillion with three other projects being subject to review and revision.
What will the effect of water and ice fluctuations be on beaver populations?	11-Jan-13	The effects on beaver populations as a result of ice populations is expected to be negligible due to the large amount of suitable habitat in the Project area. Further discussions on this can be found in the **(NRSI impacts report) located in Annex III.**
A question was asked about Stage II fieldwork.	11-Jan-13	The Stage II work is completed, and found a culturally significant site known as the Belmer Site. The assessment and subsequent report recommended a Stage III assessment if avoidance wasn't possible. Xeneca decided move ahead with preparing an avoidance strategy for the Project Site which was reviewed and then approved by MTCS. Information on this avoidance strategy can be found in Annex VI.

Will there be fish passage for Walleye?	11-Jan-13	Fish passage is not contemplated at this site as passage is not required. There is suitable spawning habitat both above and below the proposed dam site, and therefore passage is not a requirement. Ecological and spawning-related issues have been thoroughly studied and discussed with agencies. Operational commitments are found in the Operation Plan located in **Annex I** that outlines how spawning will be maintained throughout post-construction operation. These commitments will ensure ecological integrity.
What is the height of the proposed structure?	11-Jan-13	The spillway crest of the proposed dam structure will rise approximately 6 meters above the current river level. On both river banks, the wing walls that tie the dam into the bedrock will rise an additional 2 meters.
Does Xeneca have any knowledge of historical portage routes at the location?	11-Jan-13	No evidence of historical portages was located, however a new portage route will be added as part of the project design. A Portage route will be constructed as part of the effort to allow for unobstructed passage. This portage route is described in Part B, Section 1.5 of the ***Wabageshik Rapids Hydro Project Construction Management Plan***. During construction there will be a temporary portage route, the final portage route will be more direct. These two routes are shown on diagrams in the Construction Sequence Drawings in the *Wabageshik Rapids Hydro Project Construction Management Plan: Appendix A.* located in **Annex II.**

The project area is within an area of high use. The MNO has determined that a traditional knowledge study is necessary,	11-Jan-13	The current draft MOU being discussed with Aboriginal Communities, the discussion is about Xeneca contributing to a TK study process for the wider Vermilion watershed. We are still in negotiations on the exact details. To the extent specific site development aspects are relevant to traditional uses, the consultation appears to have addressed these matters adequately.

6.7.2. Union of Ontario Indians

The Union of Ontario Indians is the Grand Council responsible for providing programs and services to 39 Member Nations with in the Robinson Huron Treaty Area (Union of Ontario Indians, 2008).

6.7.2.1. Summary of Engagement

The Union of Ontario Indians (UOI) was first notified about the project on January 6, 2012, when Xeneca called UOI to discuss a potential meeting about UOI interest in Xeneca projects.

On February 21, 2012, Xeneca met with UOI and there member First Nations to discuss Xeneca's projects, including the Wabagishik generating station. The approach to consultation policy from Xeneca and the First Nations' perspectives was discussed.

In August of 2012 the Community was notified that as per the Stage II archaeological recommendations Xeneca would be choosing to avoid the significant archaeological find at the project site, and that further studies would not be completed at this time.

6.7.2.2. Current Status of Consultation and Engagement

Throughout this period Xeneca has continued to engage the Union of Ontario Indians individually and through their member nations. To date the community has not tabled any specific concerns related to aboriginal treaty rights, traditional lands or specific community issues. Based on a general understanding of the community's traditional and current use of the area, potential concerns for the community are listed in the impact and mitigation matrix in section 7. Consultation and engagement with this community will continue throughout the construction period, and into the lifecycle operations of the project.

6.8. ABORIGINAL CONSULTATION AND ENGAGEMENT DISCUSSION

The ongoing consultation and engagement for Wabagishik starting in 2010 through to the present has provided the communities involved with notification as well as relevant information along with the opportunity to provide input and feedback to Xeneca. The presentation of the draft EA, to each community as well as the formation of the First Nation EA Peer Review Group allowed for significant input and dialogue between the proponent and the potentially affected communities. This group will further all continued opportunities for input and issues identification going forward in the permitting and construction process.

It is anticipated that issues may continue to arise as the construction and operation progresses. Xeneca is committed to adaptive management and establishing protocols within each community for addressing unidentified issues as they arise during the post construction phase and for the lifecycle of the Project.

7. EVALUATION OF POTENTIAL PROJECT EFFECTS

In the *Class Environmental Assessment for Waterpower Projects* (April 2012), an effect is described as:

"Any change to the environment, positive or negative, that could occur as a result of a project", and which can "include the impact or benefit that a project could potentially have, directly or indirectly, on the environment at any stage in the project life cycle."

Under the Ontario *EAA*, "environment" means:

(a) air, land or water,
(b) plant and animal life, including human life,
(c) the social, economic and cultural conditions that influence the life of humans or a community,
(d) any building, structure, machine or other device or thing made by humans,
(e) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or
(f) any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.

The purpose of an environmental assessment is to identify all those ecosystem components that are important to the environment (biological, social/cultural and economic) within the project area, and to evaluate how the project would affect these valued ecosystem components. The EA team has adopted the conceptual hierarchy of avoidance, prevention and mitigation for this project. Where an impact cannot be avoided or prevented, mitigation measures are considered.

Mitigation measures include:

- Reducing the magnitude and duration of the impact;
- Repairing the situation post-impact to return to a pre-impact state;
- Offsetting the impact through other means.

Investigations undertaken in support of this project identified the anticipated effects of the project, at both the generating station site and ancillary components as presented in Sections 3.2 and 3.3, respectively. Once identified, the EA team worked collectively to apply its expertise to finding solutions to avoiding, preventing or mitigating the identified effects.

Project effects and management strategies considered by the EA team during the preparation of conceptual site designs, construction plans and operation plans, and those identified through the consultation program, are presented in the following sections.

The results of the project life-cycle potential impact analysis based on available data and information and recommended mitigative measures are presented and discussed within this report under Section 7.1 (for potential ecological effects) and Section 7.2 (for potential socio/cultural/economic effects). All technical information completed by the EA team members to support the impact assessment are provided in the Annexes which accompany this document. A summary of the recommended mitigative measures is presented in tabular format for the reader's convenience in Table 33.

Over the course of the assessment process, potential effects to the natural and socio/cultural/economic environment within the project area were identified. For discussion purposes, these effects are grouped into categories, each of which is presented with a discussion of effects as they are derived from the inundation, operation strategy, and footprint of the proposed Wabageshik Rapids GS. In addition, the general mitigation strategies as they will be applied to these issues are presented. A discussion of Table 33 which indicates the effects identified and resolutions developed through the assessment is provided below in the following sections.

TABLE 33: Identified Issues, Summary of Mitigation, and Potential Residual Effects

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
General Natural Environment					
Air quality	Noise from operation of electrical generator and transformer at powerhouse and electrical connection	Operation	• design powerhouse to reduce level of noise outside the powerhouse building.	Low negative impacts - impacts mitigated or eliminated where ever possible through design	Yes
	Exhaust emissions from equipment and vehicles (construction and operation of facility)	Construction & Operation	• implement standard construction site best management practices • reduce equipment engine idling • limit the use of diesel generator during operation (typically only in emergency situations)	Low negative impacts - impacts can be mitigated or reduced by best management practices, emergency generator is used infrequently,	Yes
	Exhaust emissions, dust and noise from trucks transporting concrete to the project site	Construction	• reduce equipment engine idling • limit the use of diesel generator during operation (typically only in emergency situations) • project personnel will control dust at work sites when it is warranted by the conditions • a water truck or alternate method will be used to suppress dust on all project roads and work areas when required as a result of dry or dusty conditions • dust control techniques will be implemented prior to reaching critical conditions • trucks will be required to use dust covers when traveling through populated areas	Low negative impacts - impacts mitigated or eliminated wherever possible.	Yes
	Odour	Construction	• utilize approved waste disposal sites and best practices for VOC/organic waste disposal • appropriate disposal containers will be available for the prompt disposal of waste • full disposal containers will be removed to the appropriate waste disposal facility on a regular basis • organic/food waste will be collected daily and stored in closed, animal resistant containers until disposed of at an approved waste disposal site • an attractant management policy to minimize the effect on wildlife from the storage, preparation and disposal of food products at the construction camp will be implemented	No impacts anticipated - proper management policy implementation and handling of VOC/organic waste onsite and offsite disposal at an approved disposal location will mitigate potential impacts	No
	GHG Offsets	Operation	• waterpower can offset GHG emissions from coal-fired generation.	Positive effects due to GHG offsets by building a hydroelectric generating station to generate 14,190 MWh per year of renewable energy represents the displacement of 9,785 tons of carbon dioxide equivalent	Yes
	Dust emissions from construction activities and vehicles	Construction	• project personnel will control dust at work sites when it is warranted by the conditions • a water truck or alternate method will be used to suppress dust on all project roads and work areas when required as a result of dry or dusty conditions • dust control techniques will be implemented prior to reaching critical conditions • trucks will be required to use dust covers when traveling through populated areas	Low negative impacts - impacts mitigated or eliminated wherever possible.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Water quality (surface and groundwater)	Surface water - general construction activities along shoreline of waterway at facility and water crossings along transmission line route and access roads	Construction	• implement standard construction site best management practices • construction machinery should arrive on site in a clean condition • ensure a spill response and contingency plan is in place • maintain appropriate emergency response measures • implement wet weather restrictions • stabilize all waste materials above the high water mark • use mechanical means (not chemical) to clear and manage vegetation within ROW • all concrete work will be completed in dewatered areas, water will not be reintroduced to dewatered areas until a minimum of 48 hours after the concrete pour • project personnel will be made aware of safe concrete handling procedures. Concrete handling will employ watertight forms, spill contingencies, and designated truck clean out pits. • contractors will have prepared and will follow a Care of Water Plan • construction of earthworks will be scheduled to minimize duration of exposure • turbidity of water close to construction site will be monitored; • contain material when working near water bodies; cofferdam, silt curtains, sediment traps and settling ponds • removal of riparian vegetation should be minimised • no excavation or borrowing will be done without the appropriate plans, surveys, permits, and approvals in place • where practical, existing borrow sites and associated roads, trails or cut lines will be used instead of developing new sites • borrow sites for aggregate will be located in upland locations and separated from streams and lakes by a minimum 30 m wide buffer of undisturbed terrain in order to minimize potential for siltation • borrow area will be staked to prevent accidental over-extension of the affected area	Low negative impacts - impacts mitigated or eliminated wherever possible, use best management practices	Yes
	Surface water - In-water works construction and removal of the cofferdam: potential for excess sediment to be suspended and carried downstream by river flow	Construction	• Ensure that all rock materials placed into the river have been prewashed. • Construct and remove the cofferdam during an appropriate low flow period. • Ensure that construction takes the least possible time by having all construction materials and necessary equipment available prior to construction or removal of the cofferdam. • Avoid construction and removal during the time typically associated with spawning and egg incubation times of warm water fish species (typically April 1 to July 15). Specific timing windows should be agreed to with the local MNR as part of the permitting process;	Low negative impacts - Due to the velocities present in this section of river, it may not be possible to isolate the cofferdam construction from the channel using a silt curtain or equivalent; Adhere to all applicable standard best management practices available to the industry.	Yes
	Potential for temporary impacts to river water supply lines of nearby seasonal residents	Construction	• adhere to construction best management practices to prevent sediment run-off from entering the river. • provide a temporary alternate water line supply from upstream of the project site to impacted residents, if required	Schedule construction to periods when residents are not using the water source, or provide temporary alternate water line supply if residents are impacted, use silt and sediment controls	No
	Potential impact on effluent dilution at the Domtar dam on the Spanish River - Domtar dam requires a minimum flow of at least 17 m^3/s (as measured at the Domtar dam) at all times	Operation	• When a Level 3 drought is declared in the province, adjust operating strategy at Wabageshik Rapids GS to run-of-river • Under the proposed operating plan, the Wabageshik Rapids GS would operate as a run-of-river facility during very low flow conditions. • During modified run-of-river operations, a minimum environmental flow of at least 5 to 8 m^3/s (exact value varies depending on the season) will be released into the Vermilion River at all times; in the event that a Memorandum of Understanding with Domtar cannot be reached, at least 6.5 m^3/s will be released from the Wabageshik Rapids GS at all times. • In the event that water levels at the Domtar dam risk falling outside the compliance range, the Wabageshik Rapids GS will immediately go to run-of-river operations if it is not already operating as such.	With the proposed operating restrictions for the Wabageshik Rapids GS and commitments by Xeneca to avoid negatively impacting the Domtar dam, the Domtar dam should be able to meet its minimum flow requirements for proper effluent dilution.	No

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Water quality (surface and groundwater)	Potential for impacts to wetland complex between Brazil and Elizabeth Lakes during road construction (for the "Snowmobile Trail Road Option")	Construction & Operation	• Ensure appropriate setbacks from wetland during road construction and employ mitigation measures as identified in (surface water quality section above) • Follow applicable DFO Operational Statement and MNR Guidelines.	Carry out the Measures to Protect Fish and Fish Habitat listed in the applicable DFO Operational Statements and MNR guidelines for setbacks.	Yes
	Increased potential for algal blooms due to increased water retention time	Operation	• Maintain regular flow in head pond during operations to reduce potential for blooms (water will never be stored longer than 24 hours under any circumstance but typically storage is much less than 24 hours). • Construction and operation of the Wabageshik Rapids GS would not result in an increase in nutrient loading into Wabagishik Lake	Commitment made to ensure a maximum storage time of 24 hours. Records of any algal bloom events near the facility will be maintained. Report any algal bloom occurrence in the project's zone of influence to the MOE.	Yes
	Contamination from spills or leaks of hazardous substances	Construction & Operation	• spill prevention and containment measures to be put in place throughout operational period • ensure that workers are adequately trained in the implementation of a prepared spill response plan • personnel will be trained in the requirements for the storage and transport of hazardous material • ensure availability of spill control equipment and materials • store hazardous materials at least 150 m away from water bodies • provide impervious dikes and liners around oil, fuel and chemical storage areas • avoid in-water works during periods of high precipitation • refuel machinery on impermeable pads or pans designed to allow full containment of spills a minimum of 30 m from water bodies • fuelling and maintenance activities should occur within an area where sediment erosion control measures and all precautions have been made to prevent oil, grease, antifreeze or other materials from inadvertently entering the ground or the surface water flow • monitor area for leakage; in the unlikely event of spillage the supervising engineer would halt all construction activities and corrective measures would be implemented; any spills would be immediately reported to the MOE Spills Action Centre (1.800.268.6060) • All hydrocarbon fuels, oils, and lubricants will be stored in a secondary containment area • Drip pans will be installed on equipment to intercept minor leaks • Sumps will be installed including an oil trap to prevent contaminated water from being pumped into a water course • All fuel or lubricant contaminated materials will be collected and trucked to an approved regional disposal facility, or will be treated with in situ bio-remediation techniques approved by the Proponent and Regulators	Low negative effect - impacts possible in the event of accident/malfunction; impacts mitigated or eliminated wherever possible through implementation of best management practices.	Yes
	Surface water - Creation of the headpond may alter water quality (methyl-mercury and heavy metals)	Operation	• trees and woody debris generally will be removed from the inundation area prior to headpond filing • headpond created in association with the project will be relatively small and have well moving water compared to other hydropower projects where mercury enrichment has occurred • pre- and post-development monitoring for mercury in fish tissue and surface water is underway and will be continued into the early operational period.	No impact anticipated - The headpond at Wabagishik is relatively small and is well flushed. The proponent has met with regulators in order to determine suitable programs for surface water and mercury in fish flesh for both pre-op and post-construction period based on the MOE SW Guidance Document (Feb 2012).	No

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Water quality (surface and groundwater)	Surface water - Potential increase in suspended sediment due to fluctuation of water levels upstream and fluctuation of flows downstream.	Operation	• maximum suspended sediment concentration should not decrease the Secchi disc reading by more than 10% • Limit maximum daily fluctuations of upstream water levels at Wabagishik Lake to (±5 cm) from natural lake levels. • Operations will aim to follow natural lake levels • Limit the rate of change of upstream water levels • Where the potential for shoreline erosion or ice scour is observed, inspect and monitor for signs of erosion in year one and year five of operation to document degree of erosion and develop and implement additional mitigation measures, as required • Facility will operate as a modified run-of-river facility (run-of-river operation during extreme high and low flow periods of the year) • To reduce the magnitude of flow fluctuations during intermittent operations (when the facility is stopped at night), the maximum turbine flow during intermittent operations will be decreased from 64 m^3/s to 25 m^3/s.	Negative impacts possible - impacts mitigated or eliminated wherever possible through use of mechanical and vegetative erosion controls at key points along shoreline. Monitoring undertaken to document continued effectiveness of mitigation measures.	Yes
	Potential presence of contaminated sediment at the bottom of Wabagishik Lake - potential for the sediment deposits to be disturbed and transported downstream due to modified run-of-river operations	Operation	• The proposed Wabageshik Rapids GS is located 0.8 km downstream of the outlet of Wabagishik Lake • Water levels in the headpond will follow natural lake levels • Fluctuations in water levels in Wabagishik Lake due to daily operations will not exceed ± 5 cm around normal lake levels • Water levels in Wabagishik Lake currently fluctuate naturally throughout the year by more than 1 metre	No negative impacts anticipated - water level fluctuations due to facility operations are likely too small to stir up sediment at the bottom of Wabagishik Lake	No
	Potential stagnation of the water in the pool immediately downstream of the spillway due to reduced inflows	Operation	• A compensatory flow of 0.5 m^3/s will be continuously released into to spillway (the compensatory flow requirement increases to 2 m^3/s from March 20 to May 25). • With a compensatory flow of 0.5 m^3/s, the residence time for water in the pool is approximately 8.5 hours.	No negative effects anticipated - short residence time of the water in the pool should ensure proper circulation. Dissolved oxygen levels in the pool will be monitored during facility operations. Should the compensatory flow of 0.5 m^3/s prove insufficient for ensuring proper circulation, it will be increased to 2 m^3/s year-round.	No
Species at Risk	Impact to habitats of identified Species at Risk due to construction and operation of facility	Construction & Operation	• a discovery protocol will be developed and in place should a SAR species be encountered • a permit under Section 17(2)C of the *Endangered Species Act* will be required and an overall benefit to the species will be required/discussed. • once operation commences, an Agreement for Operation and monitoring protocols under the *Endangered Species Act* will be required/discussed with the MNR. • Effect on species and their habitat on a regional level is estimated to be negligible given the small size of the area of impact relative to the amount of comparable habitat available in the surrounding landscape	Low negative impacts possible - impacts mitigated or eliminated where ever possible. ESA or SARA Permit/ Agreement may be required for construction/ operation. Proponent will continue to monitor for the presence of SAR species which have the potential to be present within the project zone of influence and will contact the responsible agency (provincial or federal) to discuss requirements should individuals be identified	Yes
	Impact to Eastern Whip-poor-will and Common Nighthawk in powerhouse, yard and substation area	Construction & Operation	Breeding and nesting habitat for Whip-poor-will is present in one vegetation community that will be subject to clearing for the inundation area. In addition, clearing and grubbing for two temporary laydown areas, each 1,000 m^2, and temporary access roads will result in the removal of vegetation communities that potentially provide habitat for Whip-poor-will and Common Nighthawk. However, the removal of this vegetation will be minor in comparison to the surrounding landscape. Revegetation opportunities exist for the temporary disturbance areas, and impacts can be mitigated by clearing vegetation outside of the migratory bird breeding period (approximately May 9 to July 31) of any given year.	The removal of the vegetation will be minor in comparison to the surrounding landscape. Impacts can also be mitigated by clearing vegetation outside of the migratory bird breeding period (approximately May 9 to July 31) of any given year, and by revegetating the temporarily disturbed areas. As such, impacts to the habitat for Whip-Poor-Will and Common Nighthawk are considered not significant.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Species at Risk	Impact to habitat for Brown myotis and Northern myotis within the project footprint, inundation area and access road areas (maternity roosting habitat in inundation area)	Construction & Operation	The proposed road corridor will only require approximately 6 ha to be cleared, and as such, is unlikely to remove a significant number of maternal roost trees. If maternity colonies or other bat roosts are observed during development, operations, or decommissioning of the project, they will be protected from disturbance until a management plan can be developed in cooperation with the MNR. In addition, one vegetation community within the 0.4 ha area of terrestrial habitat to be cleared for inundation contains potential maternity roosting habitat for Brown Myotis and Northern Myotis. The areas to be cleared for the powerhouse, substation and temporary work areas contain only foraging habitat for these species. Overall, the area to be cleared is small compared to the habitat in the surrounding landscape, and it is unlikely that a significant number of maternity roost trees will be removed. When possible, clearing activities will be conducted outside of bat maternal roosting season (mid-May to mid-July) to reduce the impacts to any roosting bat species within the proposed inundation area.	Xeneca commits to avoid clearing vegetation during the bat roosting season. Given the expected low traffic noise (particularly at night) and relatively high proportion of forest cover, the impacts of the road and the area of inundation clearing on bat populations will probably be insignificant.	Yes
	Impact to Canada warbler in powerhouse, yard and substation area	Construction & Operation	• The habitat to be cleared for Canada warbler is not suitable for this interior-forest-dwelling species. • a discovery protocol will be developed and in place should a SAR species be encountered	As the breeding period for migratory birds during any given year occurs from approximately May 9 to July 31, any potential impacts can be mitigated by clearing vegetation outside of this period. Re-vegetation will be conducted post-construction in some areas to restore lost habitat.	No
	Impact to species of special concern, Eastern milksnake	Construction & Operation	The habitat proposed for removal (G025Tt) for the powerhouse and substation consists of softwood species and is unlikely to provide habitat for eastern milksnake. The aspen stands (G040Tt) to be removed for inundation and the temporary access road on the north shore of the Vermillion River may result in the loss of Eastern Milk Snake habitat.	Re-vegetation will be conducted in some areas post-construction to restore lost habitat. Avoid construction activities during snake hibernation period (September-March) (if snake hibernacula documented within design footprints).	Yes
	Impact to species of special concern (Eastern wood pewee) in planned powerhouse, yard and substation and within inundation area and road access areas	Construction & Operation	The area to be cleared for the inundation area, as well as temporary laydown areas (each 1000 m^2 in size), and the area to be cleared for the temporary road on the north shore of the Vermillion River provide potential foraging and breeding habitat for Eastern Wood-pewee. However, the removal of this vegetation will be minor in comparison to the surrounding landscape, and the Eastern Wood-pewee is a habitat generalist. As such impacts to this community are considered to be minimal and not significant.	Impacts can be mitigated by clearing vegetation outside of the migratory bird breeding period, which spans from approximately May 9 to July 31 of any given year. This species is a habitat generalist, and the loss of this habitat would be small relative to the surrounding landscape. Re-vegetation will be conducted post-construction to restore lost habitat.	Yes
	Impacts to Lake sturgeon spawning habitat	Construction & Operation	The impact of the loss of habitat areas upstream will be mitigated through the creation of compensatory habitat. • a permit under Section 17(2)C of the *Endangered Species Act* will be required and an overall benefit to the species will be required/discussed. • once operation commences, an Agreement for Operation and monitoring protocols under the *Endangered Species Act* will be required/discussed with the MNR. • A monitoring strategy will be developed in consultation with MNR and DFO with the objective of evaluating the performance of the habitat.	• In order to ensure that sufficient flows and levels exist during walleye spawning, the Wabageshik Rapids GS will change its operations to run-of-river starting when water temperatures reach 4°C and will continue until the hatched fry have dispersed into open water (33 days after 12°C is reached). • In order to ensure that sufficient flows and levels exist during lake sturgeon spawning, the Wabageshik Rapids GS will change its operations to run-of-river starting when water temperatures reach 8°C and will continue until the end of lake sturgeon larval development (25 days after 16°C is reached). • For Lake sturgeon larvel drift, operations will be continuous and will be limted to a daily variation in flow of 20 m^3/s for an additonal 21 days. • These operating constraints will also serve to mitigate impacts on northern pike spawning.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Species at Risk	Impact to suitable habitat for Blanding's Turtle and Snapping Turtle due to operation of facility (including potential impact to wintering areas).	Operation	• The Operating Plan makes a compliance commitment to maintaining water levels in the range of ± 15 cm of daily average levels in the bay below Wabageshik Rapids, which will reduce the potential for water level variation to impact any Blanding's Turtles that are overwintering in the bay and Tributary B. • The beaver dam on Tributary A is expected to isolate the majority of the suitable overwintering habitat in the tributary from water level fluctuations in the bay below Wabageshik Rapids. • Monitoring of turtle overwintering habitat will take place in years 1, 3 and 6 of facility operation. Possible additonal mitigation measures include changes to the minimum flow values and further constraining water level fluctuations in the bay below Wabageshik Rapids.	Under the proposed Operating Plan with the existing mitigation measures, residual impacts to Blanding's Turtle and their habitat is possible, in the event the species is found to be present. However, an ESA operating agreement would also be required and will require either no negative impact or overall benefit to the species should Blanding's Turtles be found to be present. To date, they have not been found at the project site area.	Yes
	Impact on snake and turtle species (including Species at Risk) due to development of road corridor	Construction and Operation	Mitigation measures for traffic mortality, disturbance to turtle nests, aquatic habitat disturbance, threats to hibernacula, and threats to gestation/oviposition sites will be followed as outlined in the Environmental Roads Report June 2013 Final (Annex III of this ER).	Traffic mortality can be mitigated through placement of warning signs and awareness training, reduction of traffic through access controls, speed restrictions and avoiding conducting road maintenance, and 150 m buffer zones around suitable summer habitat or road areas with known or suspected nesting sites, and limiting new roads within 50 m of hibernacula. No water drawdowns for dust control in suitable aquatic habitat; dust control using only water within 150 m of suitable habitat. If gestation or oviposition sites are discovered, no new roads, landings or pits within 50 m; no road maintenance within 50 m from June 1 to October 15th.	Yes
	Impact of road corridor development on forest nesting birds (including Whip-poor-will, a SAR).	Construction	Loss of 6 ha of forest habitat over a corridor approximately 5 km long will not result in a signficant impact at the population level, given the small amount of habitat involved. The proposed road is not expected to have a significant effect on species involved.	Minimize road corridor width to 15 m or less; revegetate temporary roads and construction areas after construction; completion of road construction during the non-breeding season (approximately mid-August to early May) to minimize noise disturbance; modify driver behaviour through warning signs, awareness training, reduce traffic speed through access control; restrict speed. For Whip-poor-will, reduce night use of roads throughout the nesting season.	Yes
	Impact of road corridor development on marsh nesting birds	Construction	Suitable habitat for marsh nesting birds is present within the study area. Potential impacts mitigation for marsh birds will be followed.	No construction will take place in marsh habitat. Road construction and maintenance will take place during the non-breeding season (approximately mid-August to early May to minimize noise disturbance); modify driver behaviour; reduce traffic speed through access control; restrict speed; no water drawdowns for dust control in suitable wetland habitat; dust control using only water within 150 m of suitable habitat.	No
Species of Conservation Concern	Impact to suitable habitat for common snapping turtle due to operation of facility	Operation	• The Operating Plan makes a compliance commitment to maintaining water levels in the range of ± 15 cm of daily average levels in the bay below Wabageshik Rapids, which will reduce the potential for water level variation to impact any common snapping turtles that are overwintering in the bay and Tributary B. This compliance commitment will also mitigate impacts on common snapping turtle nesting habitat in the bay below Wabageshik Rapids. • The beaver dam on Tributary A is expected to isolate the majority of the suitable overwintering habitat in the tributary from water level fluctuations in the bay below Wabageshik Rapids. • Monitoring of turtle overwintering habitat will take place in years 1, 3 and 6 of facility operation. Possible additonal mitigation measures include changes to the minimum flow values and further constraining water level fluctuations in the bay below Wabageshik Rapids.	Mitigation measures developed for Blanding's turtle will also protect the overwintering habitat for common snapping turtle. Effects on common snapping turtle nesting habitat will occur but are anticipated to be low in extent.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Significant earth or life science features	Potential for two provincially significant wetlands within 500 m of lines and roads (one for each road option)	Construction and Operation	Two wetlands are predicted to be provincially significant from the west end of Elizabeth Lake to Brazil Lake. Potential impacts on wetland function will be mitigated as detailed in the Wabageshik Environmental Roads Report (June 2013) Final.	Transmission lines following existing roads should utilize existing right of way; where possible, place the transmission line on the side of the road opposite the wetland. Maintain existing ditch channels to maintain the present water movement. Restore and maintain low vegetation on the transmission line right-of-way. Use passive revegetation through the existing seedbank where possible; replant trees where feasible; use equipment and techniques to minimize compaction and rutting; winter construction on frozen ground will reduce soil damage; rehabilitation should avoid use of invasive plant species.	Yes
Land subject to natural or human made hazards	Potential for spring ice damming and/or flooding on Wabagishik Lake	Operation	• Regular monitoring of water levels and establishment of reporting mechanism for local residents	Potential impacts can be mitigated by regular water level monitoring and proper operation of facility	Yes
Terrestrial wildlife (numbers, diversity, distribution)	General disturbance to habitat during construction and maintenance of facility (dam, powerhouse, etc.)	Construction & Operation	• limit use of machinery in and around watercourses and sensitive terrestrial areas • clearly define access and transportation routes to minimize disturbance • allow for detour around sensitive habitat areas • use mechanical means (not chemical) to clear and manage vegetation within ROW • limit removal of vegetation during construction/maintenance to maintain habitat connectivity • all construction traffic should adhere to speed limits and construction crews should be aware of the potential for wildlife crossings • any roadway mortalities of herpetofauna should be reported and a reduction in speed limits should be imposed in specific areas to prevent additional mortalities • the area of disturbance within the overall site boundaries will be kept to a minimum and clearing will only occur where necessitated by construction. • high visibility snow fencing will be installed to restrict heavy equipment traffic to the area identified for clearing. • travel paths, stockpile areas and staging areas will be carefully planned and followed. • Where possible, avoid important habitats • Where possible, activities will be scheduled to avoid sensitive nesting, rearing, mating, or staging periods • All food and food waste will be properly stored and disposed of to prevent attracting wildlife • All Project personnel will use proper care and caution when operating vehicles to avoid collisions with wildlife • Wildlife are relocated as required during the work and after the work has been completed	Low negative impact - Construction Management Plan will be finalized to include protocols and procedures for minimizing the disturbance to wildlife during the construction program. The clearing and grubbing of land will result in a loss of some vegetation and in turn potential wildlife habitat. In-direct impacts also have potential to occur during active construction and during operation of facility (i.e. noise, human presence and activity)	Yes
	Access road construction - habitat fragmentation	Construction & Operation	• re-claim temporary/unused access roads following completion of work • The power line and access road will run along the same corridor in order to minimize the overall project footprint.	Use existing roads and infrastructure as much as practical. Re-claim any temporary roads in discussion with MNR and Stakeholder groups, as required.	Yes
	Power Line Construction	Construction	• The power line and access road will run along the same corridor in order to minimize the overall project footprint. • This line is less than 115 kV in size and therefore exempt from a provincial EA process as per the Electricity Regulation.	The power line will use the right-of-way of the access road. Impacts on terrestrial wildlife attributable to the power lines are anticipated to be minimal.	Yes
	Impacts related to the creation of the facility and headpond	Construction & Operation	• Relative to the areas to be impacted, comparable terrestrial habitats are abundant in the surrounding region.	Low negative impacts anticipated - small facility footprint and inundation area and impacts to regional populations will be negligible as similar habitat is abundant in the area.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Terrestrial wildlife (numbers, diversity, distribution)	Operational effects on Significant Wildlife Habitats, including osprey and bald eagle foraging habitat and turtle overwintering habitat.	Operation	• Upstream operational effects will be mitigated through the compliance commitment in the Operating Plan to maintain water levels within ± 5 cm of daily average lake levels in Wabagishik Lake. • Water level fluctuations in the bay below Wabageshik Rapids will be kept within ± 15 cm of daily average levels. • Monitoring of turtle overwintering habitat will take place in years 1, 3 and 6 of facility operation. Possible additonal mitigation measures include changes to the minimum flow values and further constraining water level fluctuations in the bay below Wabageshik Rapids.	Impacts to osprey and bald eagle foraging habitat will be fully mitigated. Turtle overwintering habitat will be mitigated to a large extent, but there remains potential for some negative impact.	Yes
	Inundation and upstream operational effects on moose aquatic feeding areas in Wabagishik Lake.	Operation	• Upstream operational effects will be mitigated through the compliance commitment in the Operating Plan to maintain water levels within ± 5 cm of daily average lake levels in Wabagishik Lake. Monitoring of vegetation and wildlife within Candidate SWH will include vegetation monitoring, and surveys of amphibians, waterfowl and marsh birds during the breeding season, as well as turtle overwintering.	The upstream operational mitigation measure will avoid impacts to Wabagishik Lake, including the moose aquatic feeding areas.	No
	Impacts related to construction activity deterring deer from crossing the river in proximity to the site	Construction	• Impacts are related to increased noise and human activity at the site and so will be temporary and limited to the construction period • Human presence and activity will be significantly reduced once the facility becomes operational	Low negative impacts anticipated - disturbance of deer crossing cannot be avoided however impacts will be temporary	Yes
	General disturbance to wildlife	Construction & Operation	• Avoid important habitats, as best possible. • Activities will be scheduled to avoid sensitive nesting, rearing, mating, or staging periods, as best possible. • All food and food waste will be properly stored and disposed of to prevent attracting wildlife. • All project personnel will be trained and required to use proper care and caution when operating vehicles to avoid collisions with wildlife. • Wildlife are relocated as required during the work. • Implement timing windows to avoid disturbance to breeding birds and bat maternal colonies.	Construction Management Plan will be updated to include findings from terrestrial studies. Minimize the disturbance to wildlife during the construction and maintenance program.	Yes
	Access road impact on bat foraging (traffic noise and forest canopy area)	Construction and Operation	• Implement timing windows to avoid disturbance to breeding birds and bat maternal colonies. • Proposed road corridor of approximately 6 ha is unlikely to remove a large number of maternal roost trees; only 102 trees will be removed. If maternity colonies or bat roosts are observed during development, operation or decommissioning of the project, they will be protected from disturbance until a management plan can be developed in co-operation with MNR.	Maintain clumps of snag trees where encountered; avoid placing roads through older hardwood and mixedwood stands where possible; minimize road right-of-way width; clear right-of-way during non-breeding season, where possible, maintain interlinking forest canopy over roads, restrict traffic use.	Yes
Natural vegetation and habitat linkages	Effects on vegetation and habitat during connection line and access roads ROWs construction and maintenance	Construction & Operation	• schedule construction during winter months, when possible, to minimize habitat disturbance • limit use of machinery in and around watercourses and sensitive terrestrial areas • clearly define access and transportation routes to minimize disturbance • allow areas of exposed soil to naturally regenerate with native species • use mechanical means (not chemical) to clear and manage vegetation within ROW • limit removal of vegetation during construction/maintenance to maintain habitat connectivity	Low negative effects anticipated - Construction Management Plan will be finalized to include instructions and protocols for minimizing the disturbance to terrestrial ecosystem during the construction program. Xeneca has committed to specific measures for avoidance of vegetation clearing during bird nesting and bat roosting periods.	Yes
Natural vegetation and habitat linkages	Downstream operational impact on deer crossing to access overwintering habitats in early winter and disperse in early spring.	Operation	• There is a compliance commitment in the Operating Plan to maintain water levels in the bay below Wabageshik Rapids within ± 15 cm of daily average levels. This operating restriction will also reduce fluctuations in water levels and velocities at the downstream end of Wabageshik Rapids where deer are known to cross. • Camera monitoring willl be performed for a minimum of three years following start of operations to determine whether deer continue to utilize the crossing or find a new crossing.	There is potential for some impacts. Long-term monitoring will be conducted to measure potential impacts and develop controls, if required. This could include further operational constraints or developing alternative crossings locations/methods. Information in post-construction monitoring plan.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Natural vegetation and habitat linkages	Access road impact on deer yarding in Elizabeth Lake area	Construction & Operation	Only 0.75 ha of habitat will be disturbed, and road use is likely to be restricted and infrequent following project construction. Creation of an open corridor could create additional browse along forest edge as well as access to sun-exposed areas. Given the relatively small area of deer yard involved, negative impacts on this winter habitat will probably not impair zone targets.	The New Road Option could be rerouted to avoid an existing White Cedar stand, but this would force the road to within 150 m of a lake, with potential impacts of turtles and other values. Alternatively if the road did cross this cedar stand, a narrower road corridor could be used to maintain conifer crown closure.	Yes
	Impact on aquatic vegetation in bay below Wabageshik Rapids and downstream along riverbanks as a result of water level fluctuations	Operation	• A compliance limit of ± 15 cm in daily water level fluctuations may minimize impacts. • The aquatic vegetation in the bay below Wabageshik Rapids is predominantly submergent and floating types, which are more resilient to water level fluctuations as compared to the emergent aquatic and riverbank vegetation.	Post construction monitoring will be conducted to document changes in aquatic and riparian vegetation. Additional mitigative measures will be applied in response to observed impacts.	Yes
	Access road and connection line construction - increased potential for forest fires	Construction	• Gating roads to prevent further human access and reduce the risk of forest fires • Re-claim temporary/unused access roads following completion of work • Project personnel will be prepared and be familiar with the site Fire Preparedness Plan • Fire fighting equipment will be available to all workers and the location of such equipment will be outlined in the Fire Preparedness Plan • Locations of equipment and muster points will be advertised as necessary around the site • Project personnel will be familiar with fire-fighting techniques and the use of supplied equipment • Uncontrolled fires will be immediately reported to the nearest fire emergency service and the MNR in the case of an uncontrolled fire on Crown land • Smoking will only be permitted in designated smoking areas equipped with fire extinguishers • Disposal and storage of waste will be into proper waste containers to prevent fires	No impacts anticipated - proper implementation of construction management plan and best management practices will mitigate impacts.	No
Soil and sediment quality	Soil compaction in project construction footprint and ROW for connection line and access roads	Construction	• schedule construction of temporary access road and connection line ROW to minimize ground disturbance (winter) • stop activities when ground conditions could potentially severely disturb soil profile (high precipitation, etc) • be prepared to alter construction activities as a result of sudden thaw conditions • stabilize high traffic areas with gravel surface layer or other suitable cover material • establish a designated construction access route to minimize area of impact • time construction activities to minimize effects on surface vegetation and subsurface rooting zones • vehicles and equipment access will be restricted to the minimum area necessary • conduct site reclamation activities as soon as possible following the disturbance	No impacts anticipated - proper implementation of construction management plan and best management practices will mitigate impacts wherever possible. Soil compaction will reverse naturally over time if left undisturbed.	No
	Management of excavated materials (blast rock, fill, aggregates, etc.)	Construction	• transport blast rock to lay down area for stockpile and/or crushing; laydown areas will be situated at acceptable distances from water bodies (i.e. greater than 30 m) • install mechanical erosion control measures at blast rock storage site near water body • re-use blast rock for aggregate and shoreline stabilization • apply water to dry soil/rock to minimize dust • instruct workers and equipment operators of dust control methods • install mechanical barriers to prevent run off from dust piles into water bodies	No impacts anticipated - proper implementation of construction management plan and best management practices will mitigate impacts wherever possible. A preliminary Sediment and Erosion Control Plan (Annex II) is provided.	No

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Soil and sediment quality	Potential for encountering Acid Rock Drainage (ARD) during construction activities	Construction	• The potential for encountering issues associated with Acid Rock Drainage (ARD) is small for waterpower projects. However, a drilling and testing program of the rock material will nonetheless be conducted prior to construction in order to determine whether ARD may be encountered. • Rock sampling and analysis will be completed by a qualified professional in accordance with the methods and procedures from the Mine Environmental Neutral Drainage (MEND) guidelines. • Should the potential for ARD be confirmed, a management plan will be prepared by the proponent and approved by the applicable regulatory agencies prior to the start of rock excavation activities.	No impacts anticipated - the potential for encountering ARD is low for waterpower projects, and in the event that a risk of ARD is confirmed, a management plan will be developed and followed.	No
Aquatic and Riparian Ecosystem					
Shoreline Dependent Species	*Shoreline dependant Fish Species - See Fish Habitat Section below*				
	Inundation and construction effects on aquatic mammals (mink and otter, etc.) and their habitat	Construction & Operation	• Planning for flooding of new reservoirs should avoid the winter/ice over period when filling could cause direct mortality by drowning furbearing mammals in their dens • Impacts associated with construction would be limited to small areas within the structural footprint • Inundation effects could remove existing denning sites, however new shoreline areas with suitable denning habitat will be created following inundation • Suitable habitat for aquatic mammals is abundant in the surrounding landscape	No impacts anticipated - proper construction and operations planning will mitigate impacts to aquatic mammal species	No
	Facility construction activities impacts on shoreline habitats	Construction	• impacts largely isolated to localized clearing and grubbing of riparian vegetation • inundation will affect only a small area in relation to the abundance of similar habitat in the surrounding area	Low negative impacts anticipated - impacts to regional populations will be negligible as similar habitat is abundant in the area	Yes
	Impacts to species and habitat in Wabagishik Lake associated with water level fluctuations	Operation	• impacts will be limited to shallow littoral areas within the area of inundation and are estimated to be limited to approximately 12.5 ha • water level fluctuations in Wabagishik Lake as a result of facility operations will be limited to a maximum range of ±5 cm (0.1 m total), less than what would be observed due to wind or seiche effects.	Minimal impact anticipated - biological impacts associated with water level fluctuations are predicted to be very small.	Yes
Fish Habitat	Impact on horseshoe-shaped area located 100 m downstream of spillway due to fluctuating water levels	Operation	• Spawning habitat will be created downstream of the Wabageshik Rapids GS to compensate for the lost habitat.	No residual impact is anticipated after constructing the compensatory habitat. A monitoring strategy will be developed in consultation with MNR and DFO with the objective of evaluating the performance of the habitat.	Yes
	Inundation effects on 6,840 m^2 of lake sturgeon, walleye and sucker spawning habitat in proposed headpond as a result of inundation of riverine habitat altering it to lacustrine habitat.	Operation	• Spawning habitat will be created downstream of the Wabageshik Rapids GS to compensate for the lost habitat.	No residual impact is anticipated after constructing the compensatory habitat. A monitoring strategy will be developed in consultation with MNR and DFO with the objective of evaluating the performance of the habitat.	Yes
	Impacts on walleye, lake sturgeon and northern pike spawning downstream of the facility as a result of intermittent operations	Operation	• In order to ensure that sufficient flows and levels exist during walleye spawning, the Wabageshik Rapids GS will change its operations to run-of-river starting when water temperatures reach 4°C and will continue until the hatched fry have dispersed into open water (33 days after 12°C is reached). • In order to ensure that sufficient flows and levels exist during lake sturgeon spawning, the Wabageshik Rapids GS will change its operations to run-of-river starting when water temperatures reach 8°C and will continue until the end of lake sturgeon larval development (25 days after 16°C is reached). • For Lake sturgeon larvel drift, operations will be continuous and will be limted to a daily variation in flow of 20 m^3/s for an additonal 21 days. • These operating constraints will also serve to mitigate impacts on northern pike spawning.	No residual impact is anticipated as the mitigation measures are sufficient to avoid impacts on walleye and lake sturgeon. While northern pike spawning may be moderately affected, spawning habitat is not likely to be a limiting factor in the ability to meet the MNR's fisheries management objectives for the species.	No

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Fish Habitat	Potential effects on habitat associated with water crossings on ROWs for access roads and connection line	Construction & Operation	• Impacts to local fish populations and their habitats will be discussed with DFO and MNR as part of overall strategy for dealing with fish habitat, if any, at water crossings • DFO Operational Statement for Overhead Line Construction will be adhered to in order to minimise impacts to fish and fish habitat. • Water crossings will be minimized in developing the route. Culverts will be installed where required to ensure flows to natural channels are maintained for fish species.	No residual impact is expected as water crossings are minimized and work setbacks at crossings will avoid direct impact in the waterway.	No
	Construction activities in general	Construction	• respect all-in water timing restrictions • isolate in-water construction area before or after in-water timing restrictions to avoid impacts • placement of intakes near natural barriers to migration • ensure a qualified person is on hand to oversee de-fishing activities prior to dewatering • design habitat mitigation and compensation measures through discussion and guidance with relevant authorities • employ best management construction practices including fish relocation plan, work site isolation and sediment control measures • blasting will occur outside of appropriate fish spawning and incubation periods (specific requirements to be established with DFO and MNR) • other blasting mitigation measures may include bubble curtains, isolation and dewatering of blast area, use of smaller charges, staggering of blasts • adhere to DFO operational statements for application during crossing of waterways for construction of transmission line, including Overhead Line Construction, Temporary Stream Crossings and Maintenance of Riparian Vegetation in Existing Right-of-Ways • conduct environmental monitoring to ensure that predicted conditions are accurate • Prompt and effective clean up and restoration once construction is complete	No impacts anticipated - impacts mitigated or eliminated wherever possible. Construction Management Plan will be finalized to include instructions and protocols for minimizing the disturbance to aquatic ecosystem during the construction program.	No
	Construction of in-water facility components. The construction of the facility will result in the alteration or permanent loss of aquatic habitat	Construction	• Dam construction will take place in isolation from the river flow through the use of cofferdams. • During construction, flow will be maintained downstream through staging and sequencing of construction activities. Fish Habitat compensation will occur for loss of aquatic habitat. Within the 600 m^2 footprint of the powerhouse and spillway structures, habitat will be eliminated. This permanent impact will be addressed through fish habitat compensation.	The entire area of the powerhouse and spillway, and the area of the tailrace will affect aquatic habitat, resulting in an area of impact of approximately 400 m^2 for the powerhouse, 200 m^2 for the spillway, and 400 m^2 for the tailrace. These areas will be considered in the development of fish habitat compensation measures.	Yes
	Temporary impacts and loss of habitat related to the construction of cofferdams	Construction	• Phase 1 and 2 cofferdam construction will result in the temporary occupancy of river bed in the area of the facility •The cofferdam is anticipated to be constructed in accordance with the appropriate in-water timing window dictated by the Ministry of Natural Resources. • During construction, the flow will be maintained uninterrupted downstream through staging and sequencing of construction. • Construction best management practices will be implemented to minimize the risk of off-site migration of sediments as well as adherence to in-stream timing window restrictions for construction activity.	Temporary negative impacts are anticipated - direct impacts to aquatic habitat may occur. The cofferdam is to be placed to minimize impacts and the size of the cofferdam to be installed and how long the cofferdam remains in place will be kept to a minimum. Residual effects may need to be addressed through fish habitat compensation. Depending on DFO's requirements under the *Fisheries Act.*	Yes
	Impacts to fish and benthic invertebrate habitat within variable flow reach due to variable flows and water levels resulting from modified run-of-river operations	Operation	• Special operating constraints including run-of-river operation will be implemented during key life stages of walleye, lake sturgeon and northern pike • Bypass flows are selected so as to minimize the amount of water that is released when the facility is stopped while providing enough water to minimize stress on the aquatic environment • The facility will gradually ramp up and ramp down over a period of 60 minutes in order to avoid sudden changes in water levels and flows downstream • During intermittent operations, the maximum turbine flow will be decreased from 64 m^3/s to 25 m^3/s in order to minimize the magnitude of flow variability. • The Operating Plan contains a compliance commitment to maintain water levels in the bay below Wabageshik Rapids to within ± 15 cm of daily average levels.	With the implementation of the proposed operating constraints, impacts on fish and benthic invertebrates due to variable flows downstream of the facility are anticipated to be minor.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Fish Habitat	Potential effects on habitat and spawning from dewatering operations	Construction	• Dewatering activities will be done in a controlled manner so as not to discharge turbid water to the receiving watercourse. • Materials such as filter bags, straw bales, filter fabric and Paige wire fencing will be on site to create a dewatering corral for waste water as a contingency plan in the event that groundwater is encountered and additional filtering properties are required. • Suitable containment/treatment areas will be identified by the Contract Administrator. • The discharge point in the receiving watercourse will be carefully chosen as an area with low scour potential (i.e. bedrock bottom). • If scour potential does exist, the contractor will use energy dissipation in the form of a splash pad or rock protection for the stream bottom.	No impacts anticipated - Effects will be mitigated through construction best management practices and the ultimate discharge point to the receiving watercourse will be monitored to ensure that the filtering is effective in removing excess sediment.	No
Fish Migration	Construction of the dam represents a potential barrier to the upstream movement of fish	Construction & Operation	• No upstream fish passage is being proposed. Lake sturgeon are not known to occur in Wabagishik Lake, indicating that they do not currently pass upstream through Wabageshik Rapids. It is technically feasible for Lake sturgeon to pass upstream through Wabageshik Rapids during the 5th percentile and median flow scenarios.	Xeneca believes that fisheries management objectives can be achieved without providing upstream fish passage. Upstream passage of Walleye and Lake sturgeon is not essential because the required habitats for these species are available and can be enhanced where the species are known to occur. Compensatory habitat will be provided in the downstream Vermilion River. As the MNR is the fisheries manager, final agreement with the MNR on this matter will be achieved during the permits and approvals process.	Yes
	Impacts to downstream passage of larval and adult fish due to decreased flows in the variable flow reach	Construction & Operation	• Downstream movement of larval fish and adults will still be possible over/through the dam spillways • A minimum ecological flow of 5 to 8 m^3/s (exact value varies by season) will be passed through/over the facility to allow for the safe descent of fish • See also "*Fish impingement or entrainment resulting in injury or mortality*"	With the provision of a minimum ecological flow of at least 5 m^3/s at all times, impacts on downstream passage are anticipated to be minimal.	Yes
Fisheries	Impacts to fisheries within the project zone of influence	Construction & Operation	• The Vermilion River and Wabagishik Lake within the project's zone of influence is considered a prime area for recreational angling • Inundation of the Vermilion River between Wabagishik Lake and the project will result in a transition from river-like to lake-like conditions resulting in less available habitat for certain species but an increase in habitat for others • Spawning habitat will be created downstream of the Wabageshik Rapids GS to compensate for the lost habitat. The downstream location is being chosen in part because fish passage is not being provided at the Wabageshik Rapids GS. • Upstream operational effects will be mitigated through the compliance commitment in the Operating Plan to maintain water levels within ± 5 cm of daily average lake levels in Wabagishik Lake. • Downstream operational effects will be mitigated through the compliance commitment in the Operating Plan to maintain water levels in the bay below Wabageshik Rapids to within ± 15 cm of daily average levels and the provision of minimum flows. • Downstream operational effects on spawning of lake sturgeon, walleye and northern pike will be further mitigated by operating restrictions outlined in the Operating Plan to avoid impacts to the spawning success of these species. These operating restrictions will also mitigate most of the impact on northern pike spawning success to a sufficient extent to limit impacts on the downstream population. These operating restrictions will also mitigate the impact on Northern pike spawing success.	In order to compensate for the loss of spawning habitat, compensation habitat will be constructed downstream, which will maintain the productive capacity of the habitat that will be impacted. The maintenance of the spawning habitat will also help to ensure that the obstruction of upstream fish passage will not affect fish populations. Overall, Xeneca believes it will be possible to achieve the MNR's fisheries management objectives, which are focused on maintaining recreational fishing opportunities for walleye, northern pike and smallmouth bass and also on careful management of the isolated population of Lake sturgeon in the Vermilion and Spanish Rivers downstream of Wabageshik Rapids. As the MNR is the fisheris manager, final agreement with MNR on this matter will be achieved during the permits and approvals process. For the compensation habitat, effectiveness goals will need to be agreed upong with MNR and DFO to ensure that the effectiveness and intended function of the compensation habitat can be demonstrated.	Yes
Fish injury or mortality	Fish impingement or entrainment resulting in injury or mortality	Operation	• Engineer facility intake and design velocities to account for fish swimming capabilities to minimise potential for impingement or entrainment through turbine(s) • If significant entrainment potential is identified, consider diversion methods for vulnerable fish species including lighting, electrical barriers, air bubbling and sound barriers to prevent entrainment • Turbine design and selection will minimize fish injury or mortality.	Turbine selection will be discussed with MNR and DFO to address fish injury and mortality. A Kaplan turbine will be used to provide generation efficiency and minimize fish impingement or entrainment.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Fish injury or mortality	Fish injury or mortality as a result of cofferdam placement and dewatering	Construction	• Placement of the cofferdam will be so as to minimize mortality. Fish salvage will be carried out during the dewatering process to relocate species.	CMP will consider this potential effect and fish salvage will be carried out during the dewatering operation.	Yes
Erosion and sedimentation	Construction related impacts related to the relocation of sediments and soils - Surface water overland flow paths within the construction areas have the potential to carry construction-related sediment to the watercourse.	Construction	• Areas will be identified in advance of construction and receive added protection and scrutiny during routine construction inspections particularly during the periods before and after rain events. • Sediment and erosion control measures will be installed prior to construction and maintained diligently throughout the construction operations. • Planting of vegetative cover will then follow in the next growing season. • Maintenance and inspection of the vegetative cover will continue until such time as the disturbed areas are sufficiently stabilized through vegetative growth to prevent overland runoff of suspended materials. • If construction finishes in a cleared area, with insufficient time left in the growing season to establish vegetative cover, an overwintering treatment such as erosion control blankets, fibre matting or equivalent will be applied to contain the site over the winter period. • Stockpile and staging areas will be well removed from the watercourse and be isolated with sediment and erosion control measures to prevent migration of material to the watercourse and natural areas. • Excess material from in-water excavation will be removed immediately from the channel area and temporarily stockpiled in suitable locations identified by the design drawings and on-site areas approved by an environmental inspector.	No impacts anticipated - Adhere to all applicable standard best management practices available to the industry. A Sediment and Erosion Control Plan will be prepared prior to construction.	No
	Operation - Increased shoreline erosion due to fluctuations in water levels in the headpond and variable flow reach	Operation	• Daily fluctuations in water levels in Wabagishik Lake as a result of operations at the Wabageshik Rapids GS will be limited to ± 5 cm around natural lake levels. • Facility will operate as a modified run-of-river facility. It will operate as run-of-river during high flow periods in the spring. • Results of the geomorphic assessment indicate that the Wabageshik Rapids GS would only result in minor changes in sediment erosion and transport dynamics in the river. • inspect and monitor for signs of erosion in Year 1 and Year 3 of operation to document where and degree of erosion and develop and implement additional mitigation measures, if required.	Low negative impacts - Follow-up monitoring will be completed in Year 1 and Year 3 to determine where and to what extent erosion and sedimentation might be occurring as a result of operations.	Yes
	Deposition of sediment behind the dam due to headpond creation	Operation	The decrease in flows in the new inundation area may result in a minor increase in deposition at the location of the proposed dam. However, sediment transport between Wabagishik Lake and the proposed dam location is limited even under existing conditions.	Minimal impacts anticipated due to low sediment transport even under existing conditions. Comprehensive monitoring will take place for the first 10 years of operation.	Yes
Water levels, flows and movement (surface water)	Creation of headpond and fluctuation in levels/flows - project will result in the creation of a headpond extending approximately 800 m upstream up to Wabagishik Lake making the project lake-coupled.	Operation	• Operations at the facility will aim to follow natural lake levels • Upstream operational effects will be mitigated through the compliance commitment in the Operating Plan to maintain water levels within ± 5 cm of daily average lake levels in Wabagishik Lake.	Approximately 800 m of the Vermilion River upstream of the dam will be inundated and converted into a headpond. Wabagishik Lake will not experience an increase in depth following the creation of this headpond, and daily fluctuations in water levels in the lake will be lower than those currently experienced due to waves and seiche effects. Lake level variations are minimized and sudden changes in water levels are regulated in the proposed Operating Plan.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Water levels, flows and movement (surface water)	Variation in flows within the downstream variable flow reach	Operation	• Facility will operate as a modified run-of-river facility (run-of-river operation during extreme high and low flow periods of the year, as well as during important fish spawning events) • A downstream minimum environmental flow of at least 5 m^3/s (exact value varies seasonally) is proposed to be continually passed over the spillway of the dam and/or through the powerhouse to maintain the ecological viability of habitat within the variable flow reach • During intermittent operations, the maximum outflow from the turbines will be decreased from 64 m^3/s to 25 m^3/s, in order to reduce the daily range in fluctuating flows downstream.	During large parts of the year, flows in the downstream variable flow reach will be altered from existing conditions. The continual release of a minimum environmental flow, and restrictions on the total range of flows during intermittent operations, will minimize impacts on habitat downstream.	Yes
Water Temperature	Changes to thermal regime of waterway within headpond as a result of inundation and temporary storage	Operation	• Temporary storage would occur during night time hours when additional solar absorption is limited • The largest increase in water depth will occur between the dam and the outlet of Wabagishik Lake, approximately 800 m upstream. Daily water levels in the lake will be close (± 5 cm) to natural conditions. Any changes in the thermal regime of the waterway will likely be limited to the 800 m section of river between the dam and the lake outlet.	Minimal impacts anticipated. Storage will never be in excess of 24 hours and typically much less.	Yes
Drainage, flooding and drought patterns	Alteration from natural patterns	Operation	• Water levels in the headpond will follow natural lake levels in Wabagishik Lake, with a maximum fluctuation of ±5 cm around normal levels. • Facility will operate as a modified run-of-river facility (run-of-river operation during extreme high and low flow periods of the year, and during important fish spawning events) • Final facility design to ensure flood passage capacity and public safety issues are adequate to meet the requirements of the *Lakes and Rivers Improvement Act*.	Low negative impacts anticipated.	Yes
Aboriginal Community Considerations					
Spiritual, ceremonial, cultural or burial sites	A registered archaeological site of cultural heritage significance exists near the project area	Construction & Operation	• Stage 1 archaeological review identified areas or high archaeological potential within the project area • Stage 2 has been completed to identify the existence of archaeological resources in the project area and determine whether additional archaeological investigations/management strategies are required. The Stage 2 studies identified one pre-contact archaeological site "Belmer Site" where artifacts were recovered. • An avoidance strategy will be adopted to avoid disturbing the "Belmer Site" during facility construction and operation. Fences and signage will be installed as an additional measure to prevent disturbance to the site during construction activities. • If archaeological or heritage resources are discovered during clearing or construction, work will be stopped until an archaeologist has assessed the find and a course of action is determined. • A Discovery Protocol will be prepared and implemented for project construction	With the implementation of an avoidance strategy with respect to the Belmer Site, as well as additional precautionary measures, no impacts to archaeological resources are anticipated. Xeneca also sponsored a visit to the Belmer site which included water keepers from Whitefish River First Nations and participation from community members from Sagamok First Nation which took place on June 20, 2013.	No
Traditional land or resources used for harvesting activities	Concerns that the construction and operation of the Project will impact migration of culturally important aquatic species such as Lake Sturgeon. Broader field work on sampling and on fish passage for Lake Sturgeon has been requested.	Construction & Operation	Xeneca is prepared to make a reasonable accommodation to address the concerns of the communities in respect of Lake sturgeon at Wabagishik Lake. Several proposals have been advanced to them and Xeneca is awaiting a decision on how to proceed. Discussion with First Nations include involvement in a telemetry study to determine: 1: if there is a sturgeon population present in Wabagishik Lake and 2: if sturgeon are traversing Wabageshik Rapids. Xeneca is proposing compensatory measures to increase sturgeon spawning habitat in the river sections downstream from Wabageshik Rapids. New spawning areas will enhance reproduction in river sections that are known to have a sturgeon population.	Sagamok has advised that the communities wish to focus efforts on sturgeon restoration as part of the discussions	Yes
	Construction and operation of the facility and ancillary works (lines and roads) may restrict aboriginal access to the site during both construction and operation, impacting traditional usage of the Project area.	Construction & Operation	The roads and lines are co-linear to avoid additional cutting of trees and minimise the project footprint. Access throughout the area is not impeded.	Aboriginal communities have not identified specific negative impacts to the construction and operation of roads and lines. The communities appear not to have expressed a preference.	No

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Traditional land or resources used for harvesting activities	Construction of the dam will present a barrier to navigation by canoe and may conflict with traditional lifeways of communities. Elders have recalled the use of the river as an important travel corridor to Sagamok and the North Channel Metis.	Construction & Operation	• A temporary portage trail will be installed to allow traditional users of the river with a means of bypassing the construction site; following the completion of construction activities, a permanent portage trail will be installed. A map of the proposed portage can be seen in the Construction Management Plan. • Signage will direct users to the portage trail. • portage routes will be subject to review under the *Navigable Waters Protection Act*	Low negative impacts anticipated - a portage trail will allow for continued access to the river upstream and downstream of the facility.	Yes
	Increased access to hunting, fishing, trapping and other gathering activities due to new road access.	Construction & Operation	• Proponent has corresponded with identified and Local Aboriginal communities in the EA process • Proponent commits to providing a copy of the ER to communities for review for a minimum of 30 days • A request for identified and local Aboriginal communities to enter into discussions regarding projects within their traditional lands and an invitation to share information about the project site was issued in June 2010 • keep trap lines and trails clear of slash • minimize alteration and turbidity of fish habitat • minimize harassment of wildlife • keep staging areas tidy and free of litter	Aboriginal communities and individuals will benefit from new road access to remote locations and engage in traditional and cultural activities. Ongoing engagement and consultation with Aboriginal communities will continue after completion of the EA.	Yes
	Furbearing mammals may be impacted by fluctuating water levels in the headpond during the winter months and alteration of habitat resulting in a change in trapping which may impact traditional lifeways and economic resources of aboriginal peoples.	Construction & Operation	• The initial flooding of the new reservoir should avoid the winter/ice over period when filling could cause direct mortality by drowning furbearing mammals in their dens • Impacts associated with construction would be limited to small areas within the structural footprint • Inundation effects could remove existing denning sites, however new shoreline areas with suitable denning habitat will be created following inundation • Suitable habitat for aquatic mammals is abundant in the surrounding landscape	No impacts anticipated - proper construction and operations planning will mitigate impacts to aquatic mammal species,	No
	Habitat changes as a result of the project may result in changes in population of large game such as moose and deer and small mammals (rabbits) which communities rely on for food and other products	Construction & Operation	• limit use of machinery in and around watercourses and sensitive terrestrial areas • clearly define access and transportation routes to minimize disturbance • use woody debris and non-merchantable logs from corridor clearing to establish brush piles and downed logs adjacent to the cleared right-of-way to improve habitat • allow for detour around sensitive habitat areas • use mechanical means (not chemical) to clear and manage vegetation within ROW • limit removal of vegetation during construction/maintenance to maintain habitat connectivity • all construction traffic should adhere to speed limits and construction crews should be aware of the potential for wildlife crossings • the area of disturbance within the overall site boundaries will be kept to a minimum and clearing will only occur where necessitated by construction. • high visibility snow fencing will be installed to restrict heavy equipment traffic to the area identified for clearing. • travel paths, stockpile areas and staging areas will be carefully planned and followed. • Where possible, avoid important habitats • Where possible, activities will be scheduled to avoid sensitive nesting, rearing, mating, or staging periods • All food and food waste will be properly stored and disposed of to prevent attracting wildlife • All Project personnel will use proper care and caution when operating vehicles to avoid collisions with wildlife • Wildlife are relocated as required during the work and after the work has been completed	Mitigation outlined in the Construction Management Plan will minimize the disturbance to wildlife during the construction and maintenance program.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Traditional land or resources used for harvesting activities	Clarity of water may be affected by the project through sediment and erosion issues, which would impact an important cultural and spiritual value for many communities.	Construction & Operation	Appropriate sediment and erosion control measures will be applied during project construction to avoid impacting water quality. These include: • Ensure that all rock materials placed into the river have been prewashed. • Construct and remove the cofferdam during an appropriate low flow period. • Ensure that construction takes the least possible time by having all construction materials and necessary equipment available prior to construction or removal of the cofferdam. • Avoid construction and removal during the time typically associated with spawning and egg incubation times of warm water fish species (typically April 1 to July 15). Specific timing windows should be agreed to with the local MNR as part of the permitting process.	Low negative impacts - Due to the velocities present in this section of river, it may not be possible to isolate the cofferdam construction from the channel using a silt curtain or equivalent; Adhere to all applicable standard best management practices available to the industry.	Yes
	Quality of water may be affected by the project due to mercury levels.	Operations	• trees and woody debris generally will be removed from the inundation area prior to headpond filing • headpond created in association with the project will be relatively small and have well moving water compared to other hydropower projects where mercury enrichment has occurred • pre- and post-development monitoring for mercury in fish tissue and surface water is underway and will be continued into the early operational period.	Negligible impact anticipated - The headpond of the Wabageshik Rapids GS is relatively small and is well flushed. The proponent has met with regulators in order to determine suitable programs for surface water and mercury in fish flesh for both pre-operational and post-construction period based on the MOE SW Guidance Document (Feb 2012).	Yes
Employment	Construction and operation of the facility and ancillary works (lines and roads) may provide economic and job opportunities to aboriginal community companies, entrepreneurs and members	Construction & Operation	Xeneca is promoting its *First Nation and Aboriginal Procurement Policy* as part of ongoing dialogue with Aboriginal communties who are interested in the economic participation model and project accommodation.	Aboriginal communities, companies, entrepreneurs and community members can benef from job creation and from construction work. In the operation and maintaintenance phase, there are few opportunities for construction work or job creation.	Yes
Lands subject to land claims	The Project may impact a Specific Land Claim filed by Whitefish River in 2004 under which Whitefish River claim that the boundaries of their land to which they are entitled under the Robinson-Huron Treaty extend further than what is currently alloted.	Construction & Operation	As of 2009 the department of Aboriginal Affairs and Northern Development Canada has this claim listed as in Active Negotiation. Presently it is unclear whether the area under discussion extends upwards into the Project area. However there is no indication from either the community or any agency group with regards to this Project that it is impacted in anyway as a result of this land claim.	At this time there are no anticipated impacts as a result of this Specific Land Claim.	No
	The Project location is located in an area where a land claim is on file between the Federal Crown and Anishinabek Nation/Union of Ontario Indians which is the Grand Council of the Robison - Huron Treaty of 1850. An Agreement in Principle has been reached but no final agreement has been settled.	Construction & Operation	As this agreement largely relates to self governance it is not anticipated that this landclaim will have any impacts on the Project.	Impacts are not anticipated.	No
Economic development	Ontario's *Green Energy Act*, MNR's Site Release Policy and OWA Waterpower Class EA consultation & accomodation and Aboriginal Community assertions define or mandate economic participation and benefits to communities who will be impacted by project development.	Construction & Operation	Xeneca has entered into project benefit agreements and economic participation negotiations with Aboriginal communities who are being impacted by the project.	Aboriginal communities will benefit from the project through a range of negotiated terms and conditions including: project equity partnership, procurement of construction goods and services contracts, employment and training and community/organization capacity development.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Other	Project Sites are not located on any First Nations reserve lands or lands allocated to any other aboriginal community. The Project is located within an area covered under the Robinson - Huron Treaty of 1850	Construction & Operation	Memorandums of Understanding with identified local communities are being negotiated, asserted rights to traditional hunting and harvesting will be maintained in treaty areas.	Ongoing engagement with Aboriginal communities will continue after completion of EA.	No
	Preservation of Aboriginal culture	Construction & Operation	• Proponent has corresponded with Identified and Local Aboriginal communities in the EA process • Proponent commits to provide communities a copy of the ER for review for a minimum of 30 days • A request for identified and local Aboriginal communities to enter into discussions regarding projects within their traditional lands and an invitation to share information about the project site was issued in June 2010 • Stage 1 and 2 Archaeological Summary Report was distributed to Local Aboriginal Communities and Identified Aboriginal Communities. Local important heritage sites are protected and are not affected by project activities.	Ongoing engagement with communities during project detail design phase and permitting. In addition, a Stage 2 archaeological survey has been conducted in 2012 to identify the presence of and assess impacts to cultural heritage in the footprint of the project.	No
Land and Resource Use					
Access	Increased access as a result of upgrades or maintenance of area access roads and bridges will reduce the remote aspect of the general project area	Operation	• Selection of the "Snowmobile Trail Road Option" (crossing private property) will require landowner agreements. • If the "Snowmobile Trail Road Option" is selected, and if requested by the applicable landowners, Xeneca will install gating to restrict unauthorized vehicular traffic (note that the snowmobile trail will not be affected). • operational staff to monitor for signs of unauthorised access and report to appropriate local authorities/MNR	Low negative impacts - road upgrades and ongoing maintenance activities could result in increased access and use of the area	Yes
Access	Facility construction will lead to reduced access to land and water at the project location itself	Construction	• Public access to the immediate project area will be controlled during construction for the safety of the public and project personnel. • A combination of fencing and signage will be used to isolate the work areas • A portage trail will be installed to provide recreational users with a means to bypass the project area	Low negative impacts - loss of access will be limited to the immediate project area.	Yes
Navigation	The Vermilion River is a recognized canoe route and construction/inundation/ variable flows may alter navigational access within the project zone of influence	Construction & Operation	• there are no known existing portages at Wabageshik Rapids • A temporary portage trail will be installed to allow recreational users of the river with a means of bypassing the construction site; following the completion of construction activities, a permanent portage trail will be installed. • Signage will direct users to the portage trail. • portage routes will be subject to review under the *Navigable Waters Protection Act*	Low negative impacts anticipated - a portage trail will allow recreational users to access the river upstream and downstream of the facility.	Yes
Riparian rights or privileges	Impacts associated with inundation	Operation	• the project will operate as a modified run-of-river facility and inundation area is located entirely on Crown land in the river upstream of the proposed facilty. Wabagishik Lake riparian landowners (private land) are not expected to be affected beyond naturally-occuring lake levels (± 5cm) - no noticeable effect anticipated.	Maintaining lake water levels within the compliance band as per the LRIA approvals.	No
	Impacts associated with variable flows downstream of the facility	Operation	• Due to concerns from a landowner in the embayment immediately downstream of the proposed project site, the facility will operate in such a way that water levels in the vicinity of the landowner's property will not fluctuate by more than ±15 cm	Maintaining downstream water levels within the operational compliance band as per the LRIA approvals and commitments made to affected riparian landownwers.	No

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Recreational use	Impacts to nearby snowmobile bridges and trails as a result of construction and operations of the facility	Construction & Operation	• If the "Snowmobile Trail Road Option" is selected, the access road will generally run parallel to (rather than directly on) the existing snowmobile trail in order to ensure that it can still be used by snowmobilers. The bridge over Brazil Creek will be upgraded to support both vehicular traffic and snowmobile use. • The facility will operate in such a way that a 1:100 year flood can still pass safely under the snowmobile bridge upstream of the facility. • Xeneca made a formal commitment to maintain the integrity of the nearby snowmobile bridge, upstream of the facility. Should the bridge be damaged due to construction or operation of the Wabageshik Rapids GS, Xeneca commits to the necessary repairs.	No impact anticipated. Continued snowmobile use of the area will be ensured. The proponent commits to repairing the snowmobile bridge if it is damaged as a result of construction or operational activities.	No
Angling, hunting opportunities	Project falls within Bear Management Areas - effects on bear hunting	Construction & Operation	• keep trails clear of slash • minimize harassment of wildlife • keep staging areas tidy and free of litter	No impact anticipated - impacts to the habitat of targeted species is anticipated to be negligible in proportion to the availability of suitable habitat surrounding the area.	No
	Project site is used by anglers	Construction & Operation	• consult with MNR and anglers to determine periods of use and values • provide for and maintain access around the site and within the zone of influence to ensure safe passage access for anglers	No impact is expected. Anglers and recreational users of the area will continue to have access and opportunity for recreational enjoyment of the Vermilion River. Some increased opportunity could occur due to construction of access roads.	No
Trapping	Project falls within registered trap line areas	Construction & Operation	• keep trap lines and trails clear of slash • minimize harassment of wildlife • keep staging areas tidy and free of litter	No impact anticipated - impacts to the habitat of targeted species is anticipated to be negligible in proportion to the availability of suitable habitat surrounding the area.	No
Baitfish harvesting activities	Project falls within registered commercial baitfish harvesting areas	Construction & Operation	• see Fisheries and Fish Habitat issues and mitigation above • minimize alteration and turbidity of fish habitat	No impact anticipated	No
Views or Aesthetics	Potential impacts due to project construction and operation on Wabagishik Lake and the Vermilion River	Construction & Operation	• Water levels in the headpond will follow natural lake levels in Wabagishik Lake to within a range of ± 5 cm. • facility will operate as a modified run-of-river facility (run-of-river operation during extreme high and low flow periods of the year, and during important fish spawning events (approximately 3 months per year)) • Minimize site clearing. Landscape to rehabilitate the construction site. • Apply Best Management Practices and traffic planning to contain construction equipment in designated work areas. • Use natural materials in the new structures wherever practicable.	No impact anticipated	No
An existing land or resource management plan	Forest resources on Crown Land in the vicinity of the site are allocated under a Sustainable Forestry License to Northshore Forest Inc. - EACOM; clearing of resource in alignment with FMP and knowledge of SFL	Construction	• negotiate with SFL holder and MNR to permit for the harvesting/clearing of forest resources within the proposed inundation area/road construction/connection line ROW prior to construction/flooding	Ongoing engagement and consultation with SFL holder will continue after completion of EA; agreement will be sought with SFL to ensure first rights to merchantable wood and improved access routes.	No
An existing land or resource management plan	An amendment to the Vermilion/Spanish River WMP will be required in 2014.	Operation	• The operation of the facility will be aligned with the existing Vermilion/Spanish River WMP during a comprehensive review in 2014 • Water management planning principles taken into account during project planning and incorporated into operating plan for the facility	Engagement and consultation with Vermilion/Spanish River WMP SAC will continue after completion of EA and Xeneca will participate in the WMP comprehensive review in 2014.	No
Protected areas	No protected areas identified.	N/A	N/A	N/A	No

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Forestry	Harvesting of merchantable timber during construction	Construction	• restrict clearing to approved right-of-way to minimize area of impact • negotiate with SFL holder and MNR to permit for the harvesting/clearing of forest resources within the proposed inundation area/road construction/connection line ROW prior to construction/flooding • stumpage fee for merchantable timber on Crown land	Positive impact - Timber removal represents a potential benefit to local SFL holder by sale/processing of merchantable timber.	Yes
	Processing of non-merchantable timber	Construction	• make useable fuel wood available to local communities • chip brush and slash to minimize fire hazards • site ROW along existing access where possible to limit soil/habitat disturbance • ROW maintenance should be completed using mechanical (not chemical) controls	No impacts anticipated - following removal of merchantable timber, ROW maintenance will be required every 4-5 years.	No
Mine claims	There are no mining claims within the vicinity of the project	N/A	N/A	N/A	No
Cultural Heritage Resources					
Archaeological sites	Disturbance or destruction to archaeological resources, including the "Belmer Site"	Construction & Operation	• Stage 1 archaeological review identified areas or high archaeological potential within the project area • Stage 2 has been completed to identify the existence of archaeological resources in project area and determine whether additional archaeological investigations/management strategies are required. The Stage 2 studies identified one pre-contact archaeological site "Belmer Site" where artifacts were recovered. • An avoidance strategy will be adopted to avoid disturbing the "Belmer Site" during facility construction and operation. Fences and signage will be installed as an additional measure to prevent disturbance to the site during construction activities. • If archaeological or heritage resources are discovered during clearing or construction, work will be stopped until an archaeologist has assessed the find and a course of action is determined. • A Discovery Protocol will be prepared and implemented for project construction	With the implementation of an avoidance strategy with respect to the Belmer Site, as well as additional precautionary measures, no impacts to archaeological resources are anticipated.	No
Buildings or structures	Disturbance or destruction to heritage buildings or structures	Construction & Operation	• Stage 1 archaeological assessment did not identify potential for built heritage structures within the project area. Stage 2 field investigation have determined that no existing buildings or structures in project area may require built heritage assessment.	No potential for built heritage structures identified. No impacts anticipated.	No
Cultural heritage landscapes	Disturbance or destruction to cultural heritage landscapes	Construction & Operation	• Neither Stage 1, nor Stage 2 archaeological assessments have identified any potential for cultural heritage landscapes within the project area.	No potential for cultural heritage landscapes identified. No impacts anticipated.	No
Social and Economic					
The location of people, businesses, institutions or public facilities	Disruption to access, schedules and activities	Construction	• limit disruptions to traffic flow by maintaining adequate access along travelled routes, and alternate access if required • avoid sensitive time periods and advise residents of planned activities that may cause a disruption in access • construction materials and equipment should be segregated in staging areas during off hours • monitor condition of gravel roads and if construction traffic is causing damage, ensure that repairs are undertaken promptly	During construction some short periods of traffic disruptions may be needed and if so signage will be installed and police notified in advance.	Yes

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
The location of people, businesses, institutions or public facilities	Potential impact to Vale's Lorne Falls GS tailrace upstream of proposed site during periods of high flows	Operation	• Water levels in the headpond of the Wabageshik Rapids GS will be maintained to follow natural lake levels • Fluctuations in water levels in Wabagishik Lake will not exceed ± 5 cm around natural levels. • Development of operational agreement between Vale and Xeneca to address water management in the event of high flows to mitigate any impacts to tailrace of Lorne Falls GS; Inter-agency co-operation and sharing of hydraulic, bathymetric and operational data; amendment of water management plan to address co-operative management of flows	A commitment letter was prepared by Xeneca and submitted to Vale on June 27, 2013, outlining Xeneca's commitment not to negatively impact operations at the Lorne Falls GS, as well as the measures that will be adopted to ensure that the Wabageshik Rapids GS adheres to its operating curve. With the proper adherence to the operating plan, the Wabageshik Rapids GS is not anticipated to result in impacts to Vale's Lorne Falls GS.	No
	Potential impact to hydroelectricity generation at the Domtar dam due to modified run-of-river operations at the Wabageshik Rapids GS - flows that exceed the turbine capacity of the Domtar dam must be spilled over the spillway, representing a loss in potential electricity output	Operation	• Should water levels at the Domtar dam's headpond approach the limits of its compliance range, the Wabageshik Rapids GS will revert to run-of-river operations, if it is not already doing so • Hydraulic analyses indicate that, on occasions when the Wabageshik Rapids GS results in an 'increase' in flows reaching the Domtar dam, the additional water would be processed by extending the run time at the Domtar dam, and would not result in an increase in variability of outflows	Modified run-of-river operations at the Wabageshik Rapids GS are not anticipated to result in increased variability in flows reaching the Domtar Dam, and thus would not negatively impact hydroeletricity production at the Domtar Dam	No
	Increase in flow variability at the Domtar Dam may increase manpower requirements for operations	Operation	• Fluctuations downstream of the Wabageshik Rapids GS would generally be significantly less than current fluctuations downstream of the Domtar Dam • Xeneca commits to operating the proposed Wabageshik Rapids GS so as to avoid negatively Domtar's waterpower production, effluent treatment, revenue generation and environmental flow commitments.	No impacts anticipated - proposed operating constraints and commitments to Domtar will mitigate potential negative impacts to operation and maintenance requirements at the Domtar Dam	No
	Minimum flow requirements at the Domtar Dam for effluent dilution - see "Potential impact on effluent dilution at the Domtar dam on the Spanish River", in the Water Quality section above				
Community character, enjoyment of property or local amenities	Potential effects on property enjoyment, recreational water use, tourism values, aesthetic image	Operation	• Downstream operational effects will be mitigated through the compliance commitment in the Operating Plan to maintain water levels in the bay below Wabageshik Rapids to within ±15 cm of daily average levels. • Ramp up and ramp down of the facility will occur gradually over a period of 60 minutes to avoid sudden changes in flows and levels downstream.	No impacts anticipated	No
Employment - Local and regional labour supply	Construction activities will support direct and indirect local employment	Construction	• promote contract bids and offers of service from local communities including Espanola and surrounding areas	Positive impact - construction and operation represents a potential benefit to local communities	Yes
Public health and/or safety	Forest or brush fires caused as a result of project activities	Construction & Operation	• project personnel will be prepared and be familiar with the site Fire Preparedness Plan • fire fighting equipment will be available to all workers and the location of such equipment will be outlined in the Fire Preparedness Plan • Locations of equipment and muster points will be advertised as necessary around the site • project personnel will be familiar with fire-fighting techniques and the use of supplied equipment • uncontrolled fires will be immediately reported to the nearest fire emergency service and the MNR in the case of an uncontrolled fire on Crown land • smoking will only be permitted in designated smoking areas equipped with fire extinguishers • disposal and storage of waste will be into proper waste containers to prevent fires	No impacts anticipated - proper implementation of construction management plan and best management practices will mitigate impacts wherever possible.	No

Environmental Component	Issue	Phase of Development	Mitigation	Resolution / Result	Residual Effect (Yes/No)
Public health and/or safety	Impacts associated with facility construction	Construction	• Restriction of public access to the site during construction (fencing, signage, etc.) • provide and maintain routes for the public to be able to bypass the site (portage, etc.) • proper barriers and warning devices installed following construction to restrict public access to intake/tailrace areas during operation, including safety booms, fencing and signage	No impacts anticipated - proper implementation of construction management plan and best management practices will mitigate impacts wherever possible.	No
	Safety of ice fishing and snowmobiling upstream and downstream of the dam sites	Operation	Placement of signage in the vicinity to warn recreationists of potential danger due to fluctuations in water levels below the ice surface as a result of facility operations.	Installation of safety signs warning of dangerous winter ice conditions at access points to headpond and variable flow reach. On-going communication with the snowmobile association.	No
	Impacts for navigation and recreation associated with facility operation	Operation	• A public safety measures plan will be developed for the site to identify hazards and suggest mitigation measures to address identified safety issues • proper barriers and warning devices installed following construction to restrict public access to intake/tailrace areas during operation, including safety booms, fencing and signage • A portage trail around the facility will be provided by the proponent	Minor impacts anticipated to the navigability of the Vermilion River at Wabageshik Rapids. Proper implementation of construction management plan and best management practices will mitigate impacts to overall recreational use wherever possible.	Yes
	Production of waste in and around work site	Construction & Operation	• Appropriate disposal containers will be available for the prompt disposal of waste • full disposal containers will be removed to the appropriate waste disposal facility on a regular basis • Organic/food waste will be collected daily and stored in closed, animal-resistant containers until disposed of at an approved waste disposal site • keep staging areas tidy and free of litter • Bear awareness training will be provided to all Project personnel.	No impacts anticipated - proper implementation of construction management plan and best management practices will mitigate impacts wherever possible.	No
Water Supply	Impacts to local water supply	Construction	• Ministry of the Environment well records search revealed no private or municipal ground water wells within 1 km of the site • It is possible that recreational users are taking river water for personal consumption - see Water Quality	Schedule timing of construction at period when residents are not using the water source OR provide temporary alternate water supply for resident(s) that could be impacted, if at all.	No
Aesthetic image of the surrounding area	Powerhouse and inundation of falls	Operation	• the powerhouse is small and located 800 m from Wabagishik Lake, no aesthetic effects are anticipated.	powerhouse will be a low-level structure, and will not visible except when in close proximity	Yes
Energy/Electricity					
Reliability	Voltage support	Operation	• Capacity of new power generation units are relatively small	Operation of facility in parallel with the existing power grid will provide minor impact on the overall power system reliability and power quality (voltage and frequency)	Yes
Electricity flow patterns	Power flow system	Operation	• Appropriate mitigation technical measures will be proposed in the control system of the power grid and new generation units if required	Operation of the new power generation units will redistribute power flow in the existing distribution system.	Yes
Other	Protection control settings	Operation	• Appropriate mitigation technical measures will be proposed in protection and control system of the power grid.	Operation of the new power generation units will affect existing protection and control settings in the distribution system.	No

7.1. IDENTIFIED POTENTIAL ECOLOGICAL EFFECTS

For discussion purposes, the natural environment effects are grouped into the following categories:

- Water Quality
- Erosion and Sedimentation
- Species at Risk
- Terrestrial Wildlife and Habitat
- Aquatic Wildlife and Habitat

The assessment of the effect of the project on these attributes is provided below in the following sections.

7.1.1. Water Quality

During the operational stage, potential effects on water quality may occur as a result of accidental spills and shoreline erosion caused by inundation and water level fluctuation in the headpond. To determine any potential impacts on water quality, the proponent has committed to a pre- and post-development monitoring program for the proposed Wabageshik Rapids GS that includes a surface water quality and fish tissue sampling program (see Annex IV). The pre-development water quality program and completed fish tissue sampling report can be found in Annex IV.

Potential Disturbance of Contaminated Sediment in Wabagishik Lake

Due to the long history of mining activities in the Vermilion River watershed, concern was raised by public stakeholders that the modified run-of-river facility may disturb contaminated sediments deposited at the bottom of Wabagishik Lake and redistribute them to downstream reaches of the Vermilion River. The proposed Wabageshik Rapids GS, located approximately 0.8 km downstream of the outlet of Wabagishik Lake, would operate in such a way as to ensure that lake levels are equal to the levels that would occur under natural conditions. Fluctuations to lake levels resulting from daily operations would be kept within ± 5 cm. As a result, operations at the proposed Wabageshik Rapids GS are not anticipated to result in the disturbance of bottom sediment in Wabagishik Lake.

Impacts on Oxygen Levels in the Pool Immediately Downstream of the Spillway

A deep pool is located immediately downstream of the spillway, and partially overlaps with the bypass reach of the proposed facility (i.e. the natural river channel that will experience reduced flows due to the diversion of a portion of the flows into the powerhouse). Although the bypass

reach is relatively short (approximately 25 m long), some concern was expressed that, with an inflow equivalent to the compensatory flow (0.5 m^3/s, except between March 20 and May 25, at which time the compensatory flow will be 2 m^3/s), the water in the pool may become stagnant.

Based on the estimated volume of the pool (approximately 15,355 m^3), the residence time for water in the pool was calculated as being approximately 8.5 hours when supplied with a compensatory flow of 0.5 m^3/s. With this turnover time, impacts associated with stagnant water are not anticipated to be significant (see Agency meeting minutes from March 21, 2013 in Appendix C of this ER). Dissolved oxygen concentrations will be monitored in the pool both before and after project construction. Should the compensatory flow of 0.5 m^3/s prove insufficient for ensuring proper circulation, it will be increased to 2 m^3/s. The discharge valve/port will be designed in such a manner that the outflow can accommodate any necessary adjustments to the compensatory flow requirements.

Effluent Dilution at the Domtar Dam (Spanish River)

The next dam downstream of the proposed Wabageshik Rapids GS is the Domtar dam (approximately 12 km downstream) on the Spanish River in the Town of Espanola. The Vermilion River contributes approximately 40% of the flow in the Spanish River at the confluence of these two rivers.

As communicated to Xeneca in an email on April 18, 2013, the Domtar dam must adhere to a minimum flow requirement in order to discharge effluents without negatively impacting dissolved oxygen levels in the river. At any given moment, at least 17 m^3/s, as measured at Espanola, must be available in the Spanish River at the Domtar dam. As noted during a May 16, 2013 meeting between Xeneca and Domtar, this minimum flow requirement becomes challenging to meet during low flow events.

During the EA planning process for the proposed Wabageshik Rapids GS, Xeneca outlined their commitment to ensuring that the Domtar dam is not negatively impacted by operations at Xeneca's facility. In order to mitigate negative impacts to effluent dilution at the Domtar Dam, various operating constraints at the Wabageshik Rapids GS are proposed, as explained below.

During very low flow events, the Wabageshik Rapids GS would be operating as a run-of-river facility, and would therefore not result in flows being lower compared to pre-construction conditions. During intermittent operations (when the facility is shut down at night), a flow of at least 5 m^3/s will be released at all times. In the event that water levels at the Domtar dam risk falling outside the compliance range, the Wabageshik Rapids GS will go to run-of-river operations if it is not already operating as such.

As noted in Section 6.4.2, if for any reason Xeneca and Domtar cannot reach a final agreement, Xeneca will operate such that an environmental flow of at least 6.5 m^3/s will be released from the Wabageshik Rapids GS at all times, which will provide the minimum flows required to maintain the agreed-upon effluent dilution levels at the Domtar dam.

With the proposed Operating Plan and situational, operational commitments, no impacts to the Domtar dam are anticipated as a result of the Wabageshik Rapids GS.

Potential Impacts related to Inundation (Mercury)

The potential increase of available mercury in surface water is a particular concern with water impoundment. Mercury is present naturally in soils and rocks in Ontario and is enhanced by atmospheric deposition from human sources such as the combustion of coal. Inundating land with water results in the partial release of inorganic mercury accumulated in the vegetation and soils, and decomposing flooded organic matter and vegetation often stimulates the methylating microbial community which converts mercury to its bioavailable methyl mercury form.

Mercury concentrations in fish may increase after impoundment and then decrease and stabilize in subsequent years as observed in experimental inundation in Ontario and in hydroelectric projects in Quebec. Mercury and methyl mercury may bio magnify within the food chain and can pose a health concern to humans and wildlife that consume fish. The rate of mercury accumulation in fish depends on a variety of factors including fish size, diet and trophic position, as well as site-specific factors such as the type of terrain flooded, hydraulic residence time and water level fluctuation.

Pre-development fish monitoring results collected from 2011 to 2013 in the Vermilion River near the site indicated that the concentrations of total mercury in large and forage fish are dependent on size. The Wabageshik Rapids hydroelectric facility will not impede fish movement through the project area so the study design to assess mercury concentrations in fish was based on a before/after approach with one site that will be compared between years.

The mercury concentrations of most large fish did not exceed the majority of the provincial and federal fish consumption guidelines used for comparison. No fish exceeded the MOE Guidelines for Women of Child-bearing Age and Children Under 15 (Complete Restriction), General Population Partial and Complete Restrictions, or the Health Canada Fish Consumption Guideline. Mercury concentrations in three fish exceeded the MOE Guidelines for Women of Child-bearing Age and Children Under 15 (Partial Restriction). The mercury concentrations in 19 fish exceeded the Canadian Council of Ministers of the Environment's Tissue Residue Guidelines for the Protection of Wildlife that Consume Aquatic Biota.

All large piscivorous fish sampled at Wabageshik Rapids contained mercury concentrations less than the average mercury concentration in Walleye (Sander vitreus - 0.65 ug/g) and Northern Pike (Esox Lucius - 0.52 ug/g) in 79 lakes throughout Ontario (Wren et al. 1991). Since inundation has the potential to elevate mercury concentrations it is important to note that:

1. Elevated mercury concentrations in fish tissue often occur independent of impacts associated with hydroelectric development;
2. Since there is no real-time upstream reference area (i.e., a comparable area upstream of the facility that is separated by a barrier to fish migration) it will be difficult to differentiate naturally occurring variations in mercury from facility-driven changes. Therefore, the pre-development reference will be an important temporal benchmark; and,
3. Mercury in fish should continue to be monitored following development as the mercury concentrations in some fish at Wabageshik Rapids may approach or may even exceed fish consumption guidelines after development of the headpond.

Pre- and post-construction monitoring of water quality and fish

Following hydropower development, the river's water quality could be affected as follows:

- If appreciable sediment accumulates in the impoundments of the project area, turbidity and total suspended solids could increase during peak flows as sediment flushes. The concentrations of metals and nutrients adsorbed to sediment could also increase, possibly resulting in reduced water quality;
- Mercury concentrations could increase independently of suspended sediment as a result of water impoundment alone, but mercury transport out of the impoundment would be markedly higher with increased suspended sediment, as mercury – like other metals – adsorbs to sediment. Given that the facility will operate as a run-of-the-river project, water residence time in the impoundments will be limited which will in turn, dilute the concentrations of mercury relative to what would be expected from large impoundments with longer residence times. Post-development water sampling will monitor the changes of mercury in surface water; and,
- Following development, the water temperature in the impoundments may warm from increased river surface area, which may result in lower dissolved oxygen concentrations as the water's capacity to retain oxygen decreases. The magnitude of dissolved oxygen decrease will depend on how much the water warms and other factors such as changes in water turbulent flow, which recharges water with oxygen, changes in aquatic plant growth and oxygen demand from the conversion of inundated soil to sediment.

Pre-development sampling establishes a reference of water quality and mercury in fish prior to facility development. This, plus upstream-downstream comparison in post-development water quality monitoring will allow facility-related impacts to be assessed. Water quality monitoring of surface water in years after operation will include mercury to determine any changes, while monitoring of forage and large fish will allow for an assessment of bioaccumulation rates at different trophic levels. In addition to the seasonal monitoring regime recommended by MOE, post development monitoring will be conducted during peak flows to establish a worst-case scenario for contaminants related to suspended sediment. Dissolved oxygen monitoring will be conducted in the early morning when it is typically lowest due to overnight oxygen use by plant respiration with no oxygen recharge from aquatic plant photosynthesis. Mercury in fish will continue to be monitored following development, as the mercury concentrations in some fish at Wabageshik Rapids may approach or exceed fish consumption guidelines.

7.1.2. Fluctuation in Flows and Water Levels

As the Wabageshik Rapids GS will operate as a modified run-of-river facility, water levels and flows in the Variable Flow Reach (recall Section 5.4) will fluctuate throughout the day. Unsteady-state HEC-RAS modeling was carried out in order to evaluate the potential effects of peaking operations on water levels and routing of flows in the Variable Flow Reach. The results of the model indicated that the most significant effects of peaking operations would be experienced directly downstream of the proposed structure location and that fluctuations in flows and levels would decrease with increasing distance downstream. The model results also indicate that the greatest magnitude of these effects would occur in August due to the larger range of outflows from the plant during this time of year. The results of the unsteady-state HEC-RAS modelling are summarized in the reports in Annex I of this ER.

7.1.3. Erosion and Sedimentation

Wabagishik Lake

Daily fluctuations in water levels in Wabagishik Lake as a result of operations at the Wabageshik Rapids GS will be limited to ± 5 cm around natural lake levels. In comparison, wave heights in Wabagishik Lake regularly exceed 30 cm, and wake heights from passing motor boats on the lake regularly exceed 20 cm. It is not anticipated that shoreline erosion at Wabagishik Lake would be exacerbated by operations at the Wabageshik Rapids GS.

Vermilion River

Following a geomorphic assessment of the project site (see the March 2013 report in Annex I of this ER), it was concluded that the construction of the Wabageshik Rapids GS would only result in minor changes in sediment erosion and transport dynamics in the Vermilion River. The

inundation of land between the dam and Wabagishik Lake will result in this area becoming a backwater area, and may lead to the deposition of sediment immediately upstream of the dam of the Wabageshik Rapids GS. However, even under current conditions, there is very limited sediment transport, so the creation of the headpond is not anticipated to result in a significant increase in sediment being deposited upstream of the Wabageshik Rapids GS.

In the backwater area upstream of the proposed dam site, the channel is lined with bedrock, so the fluctuation of water levels in the headpond is not expected to negatively impact bank stability and erosion.

Furthermore, to mitigate the risk of erosion to the river bed immediately downstream of the spillway, the spillway will be designed such that the final exit velocities and energy levels are consistent with existing conditions, and an optimal amount of energy dissipation can be achieved. This refinement of the spillway design will occur during the development of the detailed engineering design, following the completion of the EA. Additionally, the rapids immediately downstream of the proposed facility are dominated by bedrock, boulders and large cobbles that are all difficult to move, so impacts to the overall geomorphology of the channel by operations at the Wabageshik Rapids GS are not anticipated.

The findings of the geomorphic assessment indicate that the current river channel is stable, and the construction and operation of the proposed Wabageshik Rapids GS would not likely have a major impact on sediment transport dynamics of the Vermilion River system. A comprehensive erosion monitoring program is nonetheless proposed for the first 10 years of operation, in order to confirm the level of impact that the facility is having on channel morphology and sediment transport dynamics.

7.1.4. Species at Risk and of Special Concern

A discussion of identified potential effects and general mitigation measures can be found in the Natural Environmental Characterization and Impact Assessment report found in Annex III, and have been summarized in Table 33.

Herpetofauna

Four Non-woody Mineral Shallow Marsh wetland communities are associated with the four tributaries within the Variable Flow Reach of the proposed Wabageshik Rapids GS. These wetlands, along with the embayment area located just downstream of the rapids, provide candidate overwintering habitat for two designated turtle species: Blanding's turtle and Common snapping turtle.

Variation in water levels during the winter months (November to March) could adversely impact hibernating turtles in the tributary and backwater areas downstream of the proposed Wabageshik Rapids GS. As noted in Section 2.9.1, no Blanding's turtles were observed during field surveys, but a precautionary approach is adopted in this EA in which Blanding's turtle are assumed to be present, and impacts mitigated accordingly. A compliance commitment to maintaining water levels in the embayment area to within ± 15 cm of the daily average water level will ensure that fluctuations in water levels do not create the drops in levels that can be fatal to overwintering Blanding's turtles or Common snapping turtles. A monitoring protocol has been developed in the case that Blanding's turtle overwintering habitat is confirmed in the project area. Residual impacts on turtles are anticipated to be minimal, as mitigation measures are in place to maintain the function of the overwintering habitat.

The ecological integrity of these wetlands is imperative if habitat use by turtle species is expected to continue. The turtles were not found, however candidate habitat exists and using the precautionary approach, the proponent is committed to ensuring the ecological integrity of the wetlands is maintained. Modified peaking operations during the overwintering season (November to March) will not alter water levels by more than ± 15 cm daily. However, there is uncertainty about how much constraint on water level fluctuation is required to sufficiently mitigate the potential for impacts. It is therefore recommended that post-construction monitoring be conducted in conjunction with the ± 15 cm constraint to better understand the effects of operations on the turtle overwintering habitat function of the wetland communities and embayment area.

The Eastern milksnake, although not confirmed to be present, has candidate significant wildlife habitat in the area that may be impacted by inundation. However, the habitat proposed for removal (G025Tt) consists of softwood species and is unlikely to provide habitat for Eastern milksnake. There is potential for impacts to interfere with sensitive life history stages of SAR (Blanding's turtle if present, Northern myotis and Little brown myotis) and species at risk such as Eastern Whip-poor-will.

<u>Eastern Whip-Poor-Will, Common Nighthawk, Eastern Wood Pewee and Canada Warbler</u>

Four bird species at risk were documented within the proposed road corridor. These species included Eastern Whip-poor-will, Common nighthawk, Eastern wood pewee and Canada warbler. Whip-poor-will species prefer rock or sand barrens with scattered trees, savannahs, old burns, and open conifer plantations, and appear to avoid extensive areas of pure conifers, preferring young aspen-birch stands, successional areas, and hardwood and mixed wood stands. They prefer even-aged, young stands (up to pole age) and typically do not nest in mature stands. Most nesting occurs in dry habitats, and rock outcrops adjacent to or in extensive forests. There is

potentially suitable habitat for this species throughout much of the Wabageshik study area, including open bedrock knobs, and wetlands interspersed with forest cover.

Potential impacts for Whip-poor-will as a result of line and road construction include habitat loss, destruction of nests and disruption of breeding. Habitat loss can be mitigated by minimizing the road corridor width to 15 m or less. Destruction of nests can be mitigated by completing road construction from mid-August to early May, outside of the breeding bird season. Disruption of breeding can be mitigated by completing road construction and maintenance during the non-breeding season, and by modifying driver behavior through placement of warning signs, reducing traffic through access controls, restricting speed, and restricting night use of roads during the nesting season.

Forest nesting birds that could potentially be impacted include Canada warbler and Eastern wood pewee. Approximately 6 ha of hardwood and mixedwood stands will be lost through development of a road corridor approximately 5 km long. The impact of road development on these species will be variable, as these species are not highly sensitive to forest fragmentation, and will inhabit small woodlots and forest edges. Similarly, Common nighthawk nests in open rock barrens, clearings and cutovers where roads are present. The proposed road is not expected to have a significant effect on these species. Potential impacts and mitigation for forest nesting birds are identical to those outlined for Whip-poor-will.

Northern Myotis and Little Brown Myotis

The shoreline forest that will be cleared for the planned dam, headrace, powerhouse and powerhouse yard has suitable foraging habitat for Northern myotis (also known as Northern long-eared bat). These are Endangered Species, and thus *Endangered Species Act* (ESA) approvals will be required, and any impacts to the species must be mitigated appropriately. Maternity roosting habitat exists for these species in the vegetation to be removed from the inundation area.

There are suitable snag trees (habitat for the bats) common throughout the study area, some of which would be cleared in the corridor construction area. The proposed corridor will only require approximately 6 ha to be cleared, and as such, is unlikely to remove a significant number of maternal roost trees. If maternity colonies or other bat roosts are observed during construction, operations, or decommissioning of the project, they will be protected from disturbance until a management plan can be developed in cooperation with the MNR. If possible, clearing activities will be conducted outside of bat maternal roosting season (mid-May to mid-July) to reduce the impacts to any roosting bat species within the inundation area. Required mitigations for bat species will be determined through the SAR permit application process and will include utilization of an information gathering form before permit approvals for

clearing are granted. No significant negative impacts are anticipated on foraging habitat for bats. Given the expected low traffic noise (particularly at night) and relatively high proportion of forest cover, the impacts of the road clearing on bat populations will likely be insignificant. At least three species of bat including Hoary bat and other *Myotis* species (possibly Little brown bat and/or Northern long-eared bat) were detected through use of bat recorders in proximity to the corridor for the Snowmobile Trail Road option. This data suggests the site has value as a foraging habitat.

Lake Sturgeon

Lake sturgeon is an endangered species that has the potential to be impacted by the project's development. Lake sturgeon habitat is present in several different areas within the ZOI. Potential spawning and refuge habitat is available:

i) upstream of the proposed dam
ii) In a pool downstream of the snowmobile bridge
iii) In riffle areas, and
iv) In a pool section in the vicinity of the GS spillway.

Potential habitat is created when operating flows from the Wabageshik Rapids GS create riffle/run sequences. This area may also be used for staging and resting. Further, a large basin at the confluence of the Vermilion and Spanish Rivers provides potential additional foraging areas.

The potential impacts of dam development on Lake sturgeon migration are described in the subsection on fish passage under Section 7.1.5, below. Upstream habitat loss will be mitigated through the creation of compensatory habitat, as discussed in the Compensation section (refer to Section 9). Some spawning function will remain in riffle areas inundated following project development. Downstream of the proposed dam, the impacts of facility operation will be mitigated through operational modifications which are covered under the next section.

7.1.5. Aquatic Species and Habitats

A discussion of identified potential effects and general mitigation measures can be found in the Natural Environmental Characterization and Impact Assessment report found in Annex III, and have been summarized in Table 33.

In general, sensitive life history stages of Walleye, Northern pike and Lake sturgeon may be impacted as a result of project development. Benthic invertebrates and general fish habitat will also be impacted. This section will discuss the impacts by examining the impacted areas, including the project footprint, inundation area, and downstream fish habitats.

Project Footprint

The entire project footprint will encompass an area of 2,000 m^2, including the powerhouse (400 m^2), the powerhouse yard (500 m^2), the substation (300 m^2), the spillway (200 m^2), and the intake and tailrace (600 m^2). The design of the facility is intended to minimize the environmental footprint of the project. The construction of the dam, intake structure and powerhouse will result in the loss of aquatic habitat due to the permanent covering and infilling of the river channel within the footprint area. All other components of the project will not affect aquatic habitat. The Wabageshik Rapids GS powerhouse and spillway footprint area (600 m^2) is located at the transition from a run to a pool. The run has mostly bedrock substrate and does not provide fish spawning habitat or other important habitat function. The pool has more varied substrates and is therefore more productive habitat. The pool is also expected to provide holding or refuge areas for Walleye, Lake sturgeon and Redhorse suckers that spawn in adjacent habitats, and foraging habitat for a variety of other fish species. Northern pike are known to forage in this pool for small fish and drift (OMNR 2012b). Within physical footprint of the powerhouse and spillway structures (covering 600 m^2), these habitats will be lost. Some of the area will cover the run, but approximately 500 m^2 will cover the pool, resulting in a permanent impact on the pool area that will be addressed through fish habitat compensation.

Headrace development will result in a restructured riverbed with a smooth concrete or bedrock channel. This alteration will result in the loss of existing natural substrates and flow conditions, reducing the function and productive capacity of habitat within these areas.

Creation of the tailrace will result in the existing cobble substrates being replaced within this 600 m^2 area. Operationally, tailrace water will be directed past the pool, maintaining a hydraulic connection with the pool to keep the pool wetted. Compensatory flows in the spillway area of 2 m^3/s in the spring and 0.5 m^3/s in the summer, fall and winter will also help ensure that turnover of water is maintained within the pool, and will assist in the maintenance of pool water quality. During flows of less than 64 m^3/s, most of the water will be directed through the powerhouse and will bypass the pool. Drifting food sources for forage fish will be eliminated in the pool during these time periods. Foraging activity that is presently concentrated in the pool will become more diffuse within the rapids and the bay below the rapids. This may require foraging fish such as northern pike to expend greater energy during feeding. As ambush predators, Northern pike may shift more of their feeding activity to the bay below the rapids. This may have a negative effect on the Northern pike population because there will be less opportunity for foraging in this location. However, feeding habitat will still be available, and the impact on Northern pike feeding success is expected to be minimal and not significant.

Impacts on Fish Habitat (Inundation Area)

An 800 m section of river upstream of Wabageshik Rapids will change from a fastwater habitat to a lacustrine channel and will be coupled with the lake. A riffle area at the upstream end of the rapids situated immediately below Wabagishik Lake and a large riffle between the snowmobile bridge and the proposed dam site will be affected. These riffle areas and the run areas associated with them are assumed to provide spawning habitat for Walleye and Lake sturgeon. Wabagishik Lake itself will not be impacted by the proposed inundation as the project will be designed and operated to follow natural lake levels.

As noted in Section 5.1, water levels in the headpond of the Wabageshik Rapids GS will follow natural lake levels, such that fluctuations in water levels in Wabagishik Lake will remain within ± 5 cm of natural levels. Impacts associated with these lake level fluctuations are anticipated to be limited to the shallower, littoral areas of the lake. These littoral areas, estimated to cover 12.5 ha, already fall within the existing natural zone of fluctuation of Wabagishik Lake subject to the effects of wave action and seiche effects. Although there will be an increase in the frequency of water level fluctuations, impacts to biota in the littoral zone are predicted to be minimal and not significant, as the ± 5 cm water level fluctuations resulting from operations are within the range of naturally-occurring fluctuations on the lake.

The most meaningful change in habitat function will be the alteration of the spawning habitat for walleye and lake sturgeon. The benthic invertebrate community within this area will similarly be impacted by the hydrological and geomorphological changes. Populations of Walleye and Northern pike in Wabageshik Lake are not expected to experience any effects related to the inundation, as no Northern pike spawning grounds are situated within the inundation area, and Walleye spawning sites in the inundation area are used only by the Walleye population downstream. A total of 8,340 m^2 of spawning habitat will be lost here due to changes in water depths and velocities, and will be compensated through development of replacement habitat downstream of the dam. Replacement habitat will be created in three areas; the Wabageshik Rapids tailrace area, the bay downstream of Wabageshik Rapids, and at Graveyard Rapids, located 3 km downstream of the Wabageshik Rapids GS.

The fish habitat compensation areas will be designed to function as suitable spawning habitat for Walleye and Lake sturgeon. The design will be based on the results of the post EA two-dimensional modelling which will provide suitable depth, velocity and substrate size for the specific species.

Impact on Downstream Fish Habitat

Immediately downstream of the proposed Wabageshik Rapids GS, a 400 m section of fast water habitat will experience variation in flows and alteration of bottom substrates due to the excavation of the tailrace. This area is an existing spawning habitat for many species including Walleye, Sucker species and possibly Lake sturgeon. These spawning functions may be minimally impacted due to the excavation and disturbance of substrates. As a mitigative measure, following tailrace excavation, existing substrates will be replaced with cobble materials suitable for spawning. Potential impacts to spawning, egg incubation and early life stage development for Walleye and Lake sturgeon will be mitigated by restricting waterpower operations to run-of-river mode during the Walleye and Lake sturgeon spawning periods.

Impact on Walleye Spawning

For Walleye, operations will change to run-of-river when water temperatures reach 4°C and Walleye spawning is typically initiated. The run-of-river operation will be maintained with no flow modification until the water temperature reaches 12°C. Run-of-river flows will continue for an additional 18 days of egg incubation and 15 days of early life stage development, when Walleye fry are no longer as susceptible to flow variations. At this point, run-of-river operation will cease.

Impact on Lake Sturgeon Spawning

For Lake sturgeon, run-of-river operations will ensue when water temperatures range from 8°C to 16°C and will continue for an additional 25 days after water temperatures reach 16°C to ensure egg incubation and yolk sac absorption can occur without disruption. To ensure protection during the larval drift stage for Lake sturgeon, no intermittent flows will be permitted and a maximum daily variation in flow of 20 m^3/s will not be exceeded until 46 days have passed since water temperatures have reached 16°C. These operational restrictions will ensure that spawning related activities of both Walleye and Lake sturgeon will be minimally impacted by hydro operations.

In summary, Appendix 2 of the operating plan (see Annex I of this ER) show the facility will operate as a purely run-of-river facility starting when water temperatures reach 4°C until 25 days after a water temperature of 16°C is reached, to protect the critical life stages of Walleye and Lake sturgeon.

Impact on Northern Pike Spawning

Spawning habitat for Northern pike may be impacted by fluctuations in water levels in the downstream zone of influence. Vegetated shorelines and seasonally flooded areas are normally

utilized after ice-out by spawning Pike. Water level fluctuations in nursery and feeding areas may displace young-of-year (YOY) and foraging fish as water levels decrease. Impacts to nearshore and riparian vegetation may cause shifts in species composition, and some shorelines may exist as bare substrate due to losses of vegetation caused by water level fluctuations. These impacts will be mitigated through adherence to minimum flow requirements and a commitment to maintain water levels within a ± 15 cm range of fluctuation in the embayment area 400 m downstream of the dam. Ramping rate restrictions will ensure that changes in turbine speed will occur gradually rather than instantaneously, and will allow fish time to adapt to water level changes.

Impact on Benthic Invertebrate Density and Diversity

General productivity and habitat for benthic invertebrates as a food source for fish have the potential to be impacted by project development due to the variation in flows from operations. Benthic invertebrate habitats have the potential to be impacted directly above the proposed dam location, directly below the proposed dam location, and at Graveyard Rapids. Variation in water depths and velocities over benthic habitats can affect benthic productivity and fish foraging opportunities. Changes in the benthic invertebrate community (density, diversity) may result from the variation in water velocity and fluctuation, resulting in periodic dewatering of habitat areas. Exposure of the channel substrate may result in lower macroinvertebrate density and diversity. Daily flow changes may cause changes to the drift patterns of benthic invertebrates, and may result in reductions in standing crops of benthic invertebrates.

The effects of flow changes can be mitigated but not entirely eliminated at the proposed Wabageshik Rapids GS. Minimum flows have been established to be 5.0 m^3/s in the summer through to October, 6.5 m^3/s in November, February and March, and 8.0 m^3/s in December and January. These flows will ensure a permanently wetted area for benthic invertebrate habitat, and a limited turbine operation (Q_{TL}) of 25 m^3/s during intermittent operations will place a limit on the daily fluctuation in water velocities and depths within the portion of the habitat that remains fully wetted. The 25 m^3/s limit on turbine operation will result in a maximum ratio of 5:1 during intermittent operation when the Q_{EA} is 5.0 m^3/s.

Intermittent operations will be limited to time periods when incoming flows are less than the minimum generation requirements, which is 19.2 m^3/s plus a minimum compensatory flow in the spillway area (Q_{Comp}), which ranges from 0.5 to 2.0 m^3/s depending on the season. This ensures that continuous operation will be in effect whenever possible, minimizing the time when flow is reduced below 19.2 m^3/s. Variation in flow will generally be less during continuous operation, which will pose a smaller impact on benthic invertebrate communities that remains fully wetted, relative to intermittent operation.

During both continuous and intermittent operation, a particular 1,000 m^2 horseshoe-shaped area of habitat on the north side of the channel approximately 100 m downstream of the proposed Wabageshik Rapids GS will be affected (refer to Aquatic Assessment Mapping, Appendices, Annex III) This area will be subject to increased frequency and extent of wetting and drying. A loss of benthic invertebrate biomass will result in this area during intermittent operation, and there is potential for fish stranding. The construction of compensatory habitat in Wabageshik Rapids, downstream of the newly constructed dam will create new benthic invertebrate habitat areas. A 2-D model will be utilized to develop the compensatory habitat features.

Operational Impacts on Downstream Fish Habitat

Downstream habitat will be affected by the increased frequency of wetting and drying during continuous and intermittent operations. In the area of habitat that remains permanently wetted, there will be changes in water velocities that affect the aquatic biota, particularly benthic invertebrate communities and fish populations. Continuous operation (when the facility operates day and night, but at reduced flows at night) will typically occur in January, March, June, July, October, November and December. Continuous operation will occur when the rate of natural inflow exceeds 19.2 m^3/s plus Q_{Comp} and is less than maximum generation capacity (Q_{Tmax}) of 64 m^3/s plus Q_{Comp}, and when operational restrictions for spawning and early life stages for Walleye and Lake sturgeon are not in effect. Flows may vary by as much as 44.8 m^3/s (i.e. if 19.2 m^3/s is passed through the turbines at night and up to 64 m^3/s is passed through the turbines during the day).

Intermittent operation (when the facility shuts down at night) will most commonly occur in February, August and September, when the rate of natural inflow is less than 19.2 m^3/s plus Q_{Comp} and the operational restrictions for spawning and early life stages for Walleye and Lake sturgeon are not in effect. During this time, the turbine outflow will not exceed 25 m^3/s in order to limit the magnitude of daily fluctuations. The range of flows during intermittent operations may therefore vary by up to 20 m^3/s (during periods when a Q_{EA} of 5 m^3/s is released at night, and 25 m^3/s is released during the day).

Regardless of the measures undertaken for fish habitat compensation, the daily variation in flows from the proposed operations will result in some residual impact on biological communities due to daily dewatering of habitat. The biological monitoring plan (Annex III) will provide a means of evaluating the extent of dewatering impacts on habitat.

Within the area of habitat that will remain permanently wetted, there will be changes in water velocity, which could, during continuous operations, vary up to two-fold at the cross-section closest to the dam. However, continuous operation will typically result in changes in water velocity of less than 0.1 m/s based on typical inflows. Biological monitoring using benthic

invertebrates will provide details on potential impacts on benthic community structure that may result from activities related to the proposed operation, such as variation in flows.

Continuous operation may result in some water level impacts on tributaries, with flows in November and December being most likely to affect tributary water levels and potentially tributary access as well. Water level fluctuations will be restricted to a ± 15 cm range of fluctuation. Monthly seasonal minimum flows and restricted ramping will mitigate these impacts to some extent, but there will be a residual impact on the function of tributaries as foraging habitat.

Due to the close-coupled design of the dam and powerhouse, the pool located immediately downstream of the spillway will continue to remain wetted even with much of the river's flow being directed through the turbines and out the powerhouse's tailrace. Compensatory flows in the spillway area of 2 m^3/s in the spring and 0.5 m^3/s in the summer, fall and winter will also help ensure that turnover of water is maintained within the pool, and will assist in the maintenance of pool water quality. During flows of less than 64 m^3/s, most of the water will be directed through the powerhouse and will bypass the pool. Drifting food sources for forage fish will be eliminated in the pool during these time periods. Foraging activity that is presently concentrated in the pool will become more diffuse within the rapids and the bay below the rapids. This may require foraging fish such as northern pike to expend greater energy during feeding. As ambush predators, Northern pike may shift more of their feeding activity to the bay below the rapids. However, feeding habitat will still be available, and the impact is expected to be minimal and not significant.

Fish Stranding

Fish stranding is another potential impact that may occur in the fast-water habitat immediately downstream of the Wabageshik Rapids GS. Operational monitoring will occur to determine whether or not fish stranding occurs, and if stranding is identified as an issue, possible mitigation measures include minor habitat adjustments at problem areas to provide a pathway for stranded fish to reach the flowing water, and adjustments to ramping rates to provide more time for fish to escape stranding areas.

Fish Passage

No provision for upstream fish passage will be incorporated into the proposed Wabageshik Rapids GS. As noted in Section 6.3.1.2, the MNR indicated that they may be willing to accept the lack of fish passage at the facility on the condition that adequate habitat compensation is provided elsewhere in the same system, downstream of the Wabageshik Rapids GS, and an ecologically defensible operation plan can be agreed upon. To develop a better understanding

of the existing conditions for fish passage, water velocities were modelled in order to gain some understanding of the potential for upstream fish passage of Walleye and Lake sturgeon under existing conditions. Current water velocity and flow data from 3 cross-sections were obtained and evaluated against the swimming capabilities of adult Walleye. The results of the velocity analysis show that Walleye could potentially pass upstream through Wabageshik Rapids during their spawning period, although it would be less likely for them to reach Wabagishik Lake during years with particularly high flows.

Lake sturgeon swimming speeds are very size-dependent, and larger, sexually mature Sturgeon are more likely to swim through Wabageshik Rapids as compared to smaller individuals. Lake sturgeon swimming velocities are dependent upon size, water temperature and velocity of flows. It is unlikely that a Lake sturgeon can ascend Wabageshik Rapids during the elevated water levels of a typical spring. There is potential for a Lake Sturgeon to ascend once flows have begun to recede, or in a spring with lower flows. Specifically, it can be concluded that it is technically feasible for Lake sturgeon to pass upstream through Wabageshik Rapids during the 5th percentile and median flow scenarios used in the velocity modelling. The overall length of Wabageshik Rapids and the behaviour of Lake sturgeon are factors that were not considered in this analysis.

The installation of a dam that lacks provision for fish passage still allows for tools to successfully manage fisheries resources. Management objectives for Lake sturgeon exist only for the Vermilion River downstream of Wabageshik Rapids, because Lake sturgeon are not known to occur in Wabagishik Lake (OMNR, 2011). These objectives will be met through compensating for habitat that is functionally lost to the population of concern. Upstream passage of Walleye and Lake sturgeon is not essential because the required habitats for these species are available and can be enhanced where the species are known to occur. Loss of access for Lake sturgeon and Walleye to the upper portion of Wabageshik Rapids for spawning is one important impact of this development and will be mitigated through development of compensatory habitat in the downstream Vermilion River. The plan to replace the fish spawning habitat is consistent with the MNR's fisheries management objectives and fish passage concerns. It serves to maintain or increase Walleye productive capacity and abundance, and maintain sustainable angling opportunities for Walleye. It also maintains and potentially improves Lake sturgeon spawning areas, and can improve incubation success by constructing the compensation habitat to remain wetted as the spring flows recede. While no fish passage is being provided, the compensation habitat can be located in the Vermilion River downstream of Wabageshik Rapids, thus maintaining the spawning habitats in a location available to the Lake sturgeon population of concern.

Northern pike and Smallmouth bass populations are not expected to be affected by the introduction of a barrier to fish passage.

Graveyard Rapids

While Graveyard Rapids may support spawning activities of Walleye, Lake sturgeon and sucker species, the habitat within Graveyard Rapids is less suitable than the habitat at Wabageshik Rapids due to its relatively deeper and slower water. Similarly, production and fish foraging opportunities are relatively less at Graveyard Rapids in comparison to Wabageshik Rapids. As it is further away from the dam and will experience a lower magnitude of water level fluctuations, the mitigation measures that are already proposed for Wabageshik Rapids are assumed to be adequate for Graveyard Rapids as well.

Impingement and Entrainment

The engineered design of the intake structure and trash rack will take into account the burst swimming speed and size of the various fish species in the river (e.g. Northern pike, Walleye and Smallmouth bass) to minimise potential for impingement or entrainment through the turbine(s). Impacts associated with impingement will be mitigated in part by ensuring a sufficiently low entrance velocity to allow any fish approaching the intake to swim away. The trash racks for the intake of the Wabageshik Rapids GS are proposed to have an entrance velocity of 0.75 m/s, which is lower than the burst swimming speeds of valued ecosystem component (VEC) species, such as the three listed above. Should impingement nonetheless prove to be a threat, the proponent will consider diversion methods for vulnerable fish species including lighting, electrical barriers, air bubbling and sound barriers to deter them from approaching the intake.

Small and juvenile fish with insufficient swimming speeds may be entrained into the turbines, but the chances of survival through the turbine increase with decreasing fish size. Though larger fish species would be less likely to survive entrainment through a turbine, they are also more likely to be able to avoid entrainment due to their stronger swimming abilities.

One or two Kaplan turbines are proposed for the Wabageshik Rapids GS. Both options were assessed regarding their potential to minimize fish injury or mortality. The requirement for regulator authorization (Section 32, *Fisheries Act*) within the regulatory approval process was discussed through consultation with the appropriate government authorities (i.e. DFO).

Operational management measures that can be considered to reduce the potential risk to fish upstream of the intake can be found in Annex III.

7.1.6. Terrestrial Wildlife and Habitat

Anticipated impacts to terrestrial species and habitats are largely associated with the removal and/or alteration of existing habitat to accommodate the generating station and access corridors, the new inundation area, as well as water level fluctuations in the proposed upstream lake-

coupled headpond area. Indirect impacts may also result from noise, dust, and vehicular traffic to and from the site during the construction and operation of the facility.

Potential impacts to terrestrial wildlife and habitat are described in the sections below.

Upstream Zone of Influence

The creation of the headpond between the Wabageshik Rapids GS and Wabagishik Lake will result in the inundation of a small area of terrestrial shoreline habitat that is used by some shoreline species for a variety of activities. It is the professional opinion of the consulting team that a key identified impact is the likelihood to destroy denning sites that may exist for Mink and Otter. Therefore, although field visits in 2010 and 2011 have not confirmed the presence of Mink and Otter dens in this area, the initial filling of the headpond will not occur during the winter or ice-over period, thereby preventing any direct mortalities caused by drowning mammals in their dens. Once this prevention strategy is applied, the overall, impacts of inundation on Mink and Otter denning are likely to be minimal within the study area. The inundation of new land will result in new shoreline areas being established, which may provide denning habitat afterwards. The effect is also considered to be negligible on a broad landscape scale, given abundant availability for Mink and Otter denning habitat outside the study area. No significant impacts of flooding on other terrestrial wildlife are expected, as terrestrial habitat loss within the inundation zone will be minimal compared to the available similar habitat on the surrounding landscape. It is anticipated that proper construction sequencing and operations planning will limit impacts to aquatic mammal species, such that minimal impacts are anticipated.

Vegetation Clearing

The removal of 0.4 ha existing riparian forest will result in impacts to three ELC communities, and the habitat will be converted from terrestrial to aquatic. One of these community types (G040Tt - Dry, Sandy: Aspen - Birch – Hardwood) to be impacted may provide maternity roosting habitat for the Northern myotis and Brown myotis, bat species. Additionally, this community may provide Bat Maternity Roost significant wildlife habitat for Big Brown bats. To avoid the identified potential impact to any roosting Bat species within the affected area, clearing activities for the inundation area should be conducted outside of Bat roosting season (mid-May to mid-July). If vegetation clearing is unavoidable between May through August, bat surveys will be conducted for the presence of bat colonies. If bat colonies are present within the clearing area, appropriate mitigation activities will be undertaken after consultation with the MNR.

The removal of G040Tt vegetation may also result in the loss of potential Eastern milksnake general activity habitat. The overall impacts on these species on a landscape scale will most likely be negligible given the abundance of appropriate habitat that exists in the surrounding landscape.

Impacts to habitat within the trap line (EP043) and two BMA (Bear Management Areas) (SU-42-006 and EP-42-005) due to inundation are expected to be minimal, as similar habitat is widely available in the surrounding area. Additionally, the amount of terrestrial land to be inundated (0.4 ha) is small relative to the areas of the trap line and BMA themselves which may encompass several townships in size.

Facility Footprint

The facility footprint (powerhouse, powerhouse yard and substation) will impact an area of 1,200 m^2, however this area has a very small extent relative to the amount of similar habitat available in the surrounding area, making this impact minor. The removal of shoreline forest (G025TI) in the facility footprint may impact Northern myotis and Brown myotis, as the forest community may support suitable foraging habitat for these species. Clearing of the proposed project footprint during the non-breeding season would avoid killing or disturbing bats at maternal colonies. However, due to the abundance of suitable foraging habitat in the surrounding landscape, the overall impact on these species is anticipated to be minor. Additionally, the loss of vegetation in the development of the facility footprint is not anticipated to result in significant impacts on Mink or Otter denning habitat, Eastern milksnake habitat, or trapline/BMA's.

Downstream Zone of Influence (ZOI)

Downstream operational impacts consist mostly of effects on emergent and riparian vegetation along the riverbanks, and the wetlands associated with the tributary outlets. It is anticipated that daily operations could result in the loss of emergent and shoreline vegetation, and species composition will change to some extent. Submergent vegetation are naturally adapted to changes in water level, therefore impacts to Moose aquatic feeding areas are anticipated to be negligible. As fluctuations in water levels will be confined to the natural river channel, adjacent forest habitats for moose will not be impacted. Monitoring of aquatic vegetation will confirm the persistence of submergent vegetation within the Moose Aquatic Feeding Areas.

Aquatic vegetation within the wetland areas in the bay below Wabageshik Rapids will be less susceptible to impacts from the proposed water level fluctuations, because they are either submergent or floating and their overall moisture levels will not change. In nearshore areas vegetation may become dewatered as a result of fluctuating water levels. Post construction monitoring will be conducted to document any changes in emergent and riparian vegetation, as outlined in the biological monitoring plan (see Annex III). Additional mitigation measures may be applied in response to any observed impacts.

Downstream of the proposed facility, water level fluctuations may impact wetland communities through changes in vegetation composition, and may affect amphibian habitat (e.g. Frog species and their life cycle stages) in late June or early July, when operations switch from run-of-river to restricted continuous operations during the Lake sturgeon larval drift period. However, impacts to amphibian breeding within the woodlands will be limited to potential loss of riparian vegetation. Post-construction monitoring of vegetation cover and frog species composition will verify the predictions of effects posed by operations in these wetland communities.

Waterfowl nesting areas have been identified within the mineral shallow marshes, located at the mouths of the four tributaries in the downstream zone of influence. These areas may experience limited impacts during a portion of the breeding season (typically from the end of April to the end of June), due to daily fluctuations in water levels proposed in June. Post-construction monitoring will confirm whether there are any impacts to aquatic waterfowl nesting areas.

As Otters are adapted to natural variability within the river on a seasonal basis, it is predicted that the downstream operation of the proposed Wabageshik Rapids GS will not pose a significant impact on Otter denning. Operational constraints including a Q_{EA} of 6.5 m^3/s to 8.0 m^3/s during winter months will reduce the potential for den entrances to be exposed to predators. Additionally, the ± 15 cm maximum daily water level fluctuation 400 m downstream of the proposed GS will limit water level fluctuations within the downstream extent during modified run-of-river operations, reducing any potential impacts to Otter and Mink denning.

Minimal impacts to Osprey foraging habitat are anticipated within the Wabageshik Rapids GS study area, as forage fish abundance and perching locations are not expected to change.

Lines and Roads Corridors

Depending on the road corridor option ultimately selected, impacts may occur to one of two wetlands with the potential to be provincially significant (Wetland 3 if the Snowmobile Trail Road Option is selected, or Wetland 6 if the New Road Option is selected. See also the Baseline Environmental Conditions for Road Options report in Annex III). Therefore, in order to minimize general impacts, transmission lines will be placed on the side of the road opposite the wetland wherever possible.

The construction of an access corridor has the potential to divert water in or out of the existing wetlands. Design will maintain the existing ditch channels and avoid making ditches any deeper or wider, with the intent to maintain existing drainage patterns and minimize the possibility of diverting water to or from the wetlands.

While design will minimize the amount of wetland vegetation loss to the greatest extent possible, it is unavoidable that some wetland vegetation will be eliminated during clearing and grubbing

of the corridor. In order to lessen the impact on wetland vegetation, cleared areas will be revegetated and replanted where possible.

The compaction and rutting of peat in the wetlands during construction holds the potential to alter surface water movement and increase the likelihood of invasive plants. Winter construction on frozen ground, proper equipment, and construction best management practices will be put in place as mitigative measures to reduce compaction and rutting.

Analysis of line and road corridors identified that bats (potentially including Little brown myotis and Northern myotis) are present in the Snowmobile Trail Road Option corridor, and snag habitat, typically utilized for maternity roosting, is prevalent throughout both road corridors assessed. With a total area of about 6 ha, the proposed road corridor is unlikely to remove a significant number of maternal roost trees. At an average density of 17 trees/ha, about 102 trees would be removed. This could be reduced by avoiding portions of those stands with clumps of snag trees or reducing the right-of-way width when snags are encountered. The impact of removing about 100 snag trees will be negligible on bat populations, if snag trees occur at similar density in the surrounding landscape. If maternity colonies or other bat roosts are observed during project construction, they will be protected from disturbance until a management plan can be developed in cooperation with the MNR. Clearing the proposed road corridor during the non-breeding season would avoid killing or disturbing bats at maternal colonies; however winter works may need to consider the potential impact on hibernacula.

The New Road Option corridor, if selected, would pass directly through a winter deer yard. However, the overall impact on winter habitat availability would be relatively small, as the road corridor would only disturb approximately 0.75 ha (or 1%) of the yard's 58.7 ha extent. Additionally, following the completion of construction activities, road use would likely be restricted and infrequent. The impact of the New Road Option for the road corridor on winter deer populations is expected to be minimal.

Deer Crossing Through the Vermilion River

Higher numbers of deer crossings were documented at the downstream edge of Wabageshik Rapids during the early winter and spring months. This section of river most likely functions as an important corridor to and from deer yards located to the northwest and south of the study area.

The construction and increased human activity of the Wabageshik Rapids GS may result in disturbances to the local deer population which may be deterred from using the area and crossing the Vermilion River in proximity to the site. The analysis of deer movement within the study area revealed that the majority of crossings occur at its narrowest point downstream of the rapids where there are relatively few obstacles. Deer utilise this crossing most frequently between

9 am and 6 pm in the spring from the beginning of snow melt until the accumulation of meltwater prevents crossing. Depending on when, and for how long, construction takes place these impacts may affect the overall fitness, susceptibility to predation and distribution of the deer population. However, these potential impacts will be limited to the construction of the facility and so are judged to be temporary, as it has been predicted that augmented flows resulting from operations will not impact deer crossing. The presence of the dam structure is not anticipated to impact deer movement through the area, as the structure itself will occupy only 1,200 m^2, which a very small proportion of the total area surrounding the rapids where deer are known to cross. The impact of river regulation on deer crossings was studied by comparing deer crossings with average daily inflows. It was found that deer can cross at flows up to and exceeding 64 m^3/s, proving that deer have the ability to cross at the downstream location during higher flows in the spring.

In order to confirm continued use, Xeneca has committed to undertaking pre- and post-construction monitoring. Deer monitoring will be conducted annually for one (1) year prior to operations, and for three (3) years following the start of operations, during early winter and early spring periods when deer have been observed crossing in higher abundances. These time periods are associated with seasonal movements into and out of deer yards in the surrounding landscape. Monitoring will be accomplished through use of camera surveys at nine (9) locations, at both the downstream and upstream crossing locations.

If surveys identify adverse impacts on deer crossing due to the operations plan, appropriate mitigation measures will be discussed with Sudbury District MNR office, which could include adjustment of operational flows. Post-construction monitoring will include reporting of pre and post-construction behavior one (1) and three (3) years after project construction.

Wildlife Assessment Research Plot

There is an identified Wildlife Assessment Research Plot located in the area immediately to the east of the center line of the proposed road corridor, where it connects to Panache Lake Road - efforts will be required to ensure this value is not disturbed during road construction, should it occur in this location.

7.2. Identified Potential Socioeconomic Effects

For discussion purposes, the socio-cultural-economic identified environment effects are grouped into the following categories:

- Access
- Navigation

- Public health and safety
- Civil structures and private property
- Operations at nearby dams and waterpower facilities
- Potable water supply
- Area aesthetics
- Noise
- Employment and economy
- Land use/Land tenure
- Fishing/Hunting
- Trapping
- Canoeing/Kayaking
- Snowmobiling
- Arcaeological resources

The assessment of the identified effects of the project on these attributes is provided below in the following sections.

7.2.1. Access

Access to the project site, whether the Snowmobile Trail Road Option or the New Road Option is selected, would require a portion of the road to pass through private land (approximately 3.7 km and 5.4 km for the New Road and Snowmobile Trail Road, respectively; see also the Power Line and Road Summary report in Annex VI).

Should private landowners express concern that the construction of the access road would result in unwanted traffic and trespassing through their properties, Xeneca will install gates to limit road access across private properties to the landowners. Note that this gate will not affect the existing snowmobile trail and snowmobile use in the area, and the gates will not be on public land.

7.2.2. Navigation

The river is not used for commercial navigation but is used for recreational purposes. The construction of a dam across a navigable waterway will require an approval by Transport Canada under the *NWPA*. The proposed facility will require the establishment of one or more portages to circumvent the dam and ancillary components.

Special arrangements will be required during the construction to ensure public safety for recreationalists.

Recreational use and enjoyment of the waterway was raised during the PICs and other consultation events. Navigation impacts downstream of the site could result during times of modified run-of-river operation in the Variable Flow Reach downstream of the dam. During certain hours, the flows and water depths would be lower than those presently experienced. At other times, flows and water depth would be greater than normal. When the turbine outflow switches from one mode of operation to another (e.g. from night-time to day-time operations when the facility is in modified run-of-river mode), the change in outflow will occur gradually over a period of 60 minutes ("turbine ramp time" and "turbine ramp down time" in Table 11). The change in outflow would be sufficiently gradual to avoid creating safety hazards to recreational users of the river downstream of the facility.

Navigation in tributaries downstream of the facility may experience limited access due to water level fluctuations during continuous operations.

7.2.3. Public Health and Safety

Construction of the proposed Wabageshik Rapids project on Vermilion River poses potential public safety concerns as the area is used for various recreational activities. Primary potential public health and safety risks are generally related to construction traffic, noise and dust levels and restrictive measures for access to the site construction area. Workers safety is the subject to the requirements of the Ontario Ministry of Labour, *Occupational Health and Safety Act* O. Reg. 213/91 pertaining to construction sites. This Regulation includes references to other programs including the NBC & OBC's (National & Ontario Building Codes), WHMIS (Workplace Hazardous Materials Information System) and MSDS (Material Safety Data sheet) and OSHA guidelines (Occupational Safety and Health Association). First aid equipment will be maintained on site throughout the construction period and workers will be trained to deal with emergency situations. Worker safety at the site would be ensured via strict adherence to the Ministry of Labour occupational health and safety regulations pertaining to construction sites. First aid equipment will be maintained on site throughout the construction period and workers will be trained to deal with emergency situations.

Public access to the immediate Wabageshik Rapids project area will be controlled during construction for the safety of the public and project personnel. A combination of fencing and signage will be used to isolate construction areas from available recreational areas and to alert the public of the area about the dangers of construction and location inaccessibility. Further hazards to the public can also be mitigated by restricting public access to 'at risk' areas of the dam through the use of physical safety measures, including fences, railings, safety booms and buoys.

Accidents or malfunctions during the construction phases of the hydroelectric dam or other project related infrastructure could be hazardous to the public. These accidents vary in severity

and could include accidental spills, excessive dust levels or dam failure. The primary protective measure for accidents and equipment malfunctions is the safe design, construction, operation, and maintenance of the Wabageshik Rapids project and ancillary facilities. Furthermore, contingency planning will be implemented to deal with emergency situations (e.g. the Spill Response Plan to deal with accidental spills of materials followed by adequate spill containment and cleanup materials).

A Fire Preparedness Plan will be prepared for project personnel to adhere to. Petroleum products, fuels, oils and lubricants will comply with industry best practices and regulatory requirements with regard to shipping and handling. Equipment and vehicles will yield the right of way to wildlife, and proper care and caution will be taken when operating vehicles to avoid wildlife collisions. Project personnel will monitor weather forecasts and identify storms that may affect the project.

Where reasonable, similar practices can be used effectively to either eliminate or mitigate the hazards to the public during the operating (post-construction) stage of the project. Moreover, post-construction monitoring will ensure that all equipment is tested and inspected thoroughly to complete safety requirements. Monitoring would occur routinely on a frequency determined within the review process and may include both visual and comprehensive inspections.

A more comprehensive public health and safety assessment for the Wabageshik Rapids project will occur during the detailed design stage in accordance with the scope, tenets and responsibilities outlined in Xeneca's Waterway Public Safety Management Guideline (WPSMG). As previously noted, communication of this plan to the public is an element of this process.

Impacts to air quality associated with the project (dust, odour, exhaust, etc.) are all expected to occur mainly during the construction phase of the project and will be curtailed during operation. Given the mitigative measures which will be taken and the remote nature of the project, these impacts are anticipated to be both short term and minor and therefore not significant.

Additionally, as a modified run-of-river facility, the project will generate sustainable and renewable energy and, in combination with other green energy projects, contribute to the improvement of air quality and public health in Ontario by facilitating and compensating for the shutdown of coal-fired generation facilities throughout the province.

Those effects and management strategies associated with the construction and operation of the facility are summarised in the proposed Operating Plan found in Annex I and in the Construction Management plan found in Annex II.

7.2.4. Civil Structures and Private Property

Daily fluctuation in water levels in Wabagishik Lake as a result of operations at the Wabageshik Rapids GS will not exceed ± 5 cm; water levels in the headpond will also follow natural fluctuations in lake levels. As such, impacts to civil structures and private property are not anticipated upstream of the Wabageshik Rapids GS.

A private property is known to exist at the embayment area approximately 400 m downstream of the proposed facility. The Wabageshik Rapids GS will be operated such that water level fluctuations in the embayment area do not exceed ± 15 cm. This fluctuation in water levels is consistent in magnitude with the daily fluctuations observed in the Spanish River immediately downstream; the anticipated fluctuations downstream of the Wabageshik Rapids GS are therefore not considered substantial enough to result in significant erosion. In the event that operations result in damage to private property in the embayment area, Xeneca will assume full responsibility (see the July 19, 2012 letter to Mr. Albert Ojala in Appendix D of this ER).

The Rainbow District Snowmobile Association raised a concern regarding the location of their snowmobile bridge upstream of the project site and potential impacts of the project on their use of the bridge and nearby trails in winter. It was determined through further study and modelling that the operation of the Wabageshik Rapids GS would not impact on the use or integrity of the bridge. During the detailed design phase, design engineers will create a quantifiable inspection chart for the Operations Manager to review on an annual basis. Xeneca also formally committed to maintenance of the snowmobile bridge to assure the snowmobile club that if the bridge is damaged due to construction or operation activities, Xeneca will repair the bridge. If engineering re-certification of the bridge is ever required, Xeneca will work with the snowmobiling community to ensure that it is completed in a timely, cost-effective manner.

As noted in Section 4.2.6, concrete for the construction of the facility will be obtained from local concrete suppliers and transported by trucks to the construction site. Access to the site will be through Panache Lake Road and a new access road (see the Power Line and Road Summary report in Annex VI). The new access road will be designed and built to support the expected traffic requirements for the project, and Panache Lake Road was noted during site visits as being suitable for use as an access road. Should the repeated passage of heavy equipment impact the roads, additional grading and/or gravelling will be applied to the roads as necessary.

7.2.5. Operations at Nearby Dams and Waterpower Facilities

Domtar Dam (Spanish River)

In an analysis of the daily flow fluctuations due to operations at the Domtar dam and the proposed Wabageshik Rapids GS, it was determined that fluctuations downstream of the Wabageshik Rapids GS would be significantly less than fluctuations downstream of the Domtar dam much of the time. Operations at the Wabageshik Rapids GS would not have an effect on maximum flow variability when the turbines at the Domtar dam are running at maximum capacity, as it currently does on many days. On occasions when the Wabageshik Rapids GS results in an 'increase' in flows reaching the Domtar dam, the additional water would be processed by extending the run time at the Domtar dam, and would not result in an increase in variability of outflows. Therefore, fluctuations in flows due to operation at the Wabageshik Rapids GS would not result in an increase in flow fluctuations downstream of the Domtar dam under existing conditions. Negotiations with Domtar are ongoing through continued development of the Spanish-Vermilion Water Management Plan.

Lorne Falls GS (Vermilion River)

The Lorne Falls GS, owned and operated by Vale is located just upstream of Wabagishik Lake, and approximately 10 km upstream of the Wabageshik Rapids GS. An increase in water levels at Wabagishik Lake compared to natural conditions would result in a reduction in the hydraulic head at the Lorne Falls GS, resulting in a smaller generation of electricity. In order to mitigate potential impacts to electricity output at the Lorne Falls GS, water levels in the headpond of the Wabageshik Rapids GS will be maintained to follow natural lake levels (± 5 cm). With the proper implementation of this operating restriction, the Lorne Falls GS is not expected to be negatively impacted by the proposed Wabageshik Rapids GS.

Post-EA Consultation

It is understood that prior to obtaining Location Approval, written consent and/or a MOU with both Domtar and Vale is required, demonstrating that their concerns are addressed and that proper measures will be implemented to ensure that they will not be impacted by the proposed Wabageshik Rapids GS. As these formal agreements are not required for the EA planning process, discussions with these parties will continue after the issuance of the Notice of Completion for the Wabageshik Rapids GS project.

7.2.6. Potable Water Supply

Consideration was given to the effects of the project on surface water quality, including the potential use of the waterway as a potable water supply.

There are potential adverse effects on water quality that may occur during construction due to erosion and sedimentation, accidental spills, clearing, backfilling, contouring and excavation. As a result, construction industry best management practices will be maintained during the construction program to prevent accidental spills, control erosion and sedimentation, and to manage any groundwater that must be removed from excavations. A preliminary Erosion and Sediment Control Plan was developed for the construction phase of all of Xeneca's proposed undertakings, and is included in Annex II of this report. Spill prevention and emergency fuel supply containment measures will be required within the facility throughout the operational period; mitigation measures are described in detail in Table 33.

7.2.7. Area Aesthetics

Preserving the natural aesthetics of the waterway and surrounding area is being considered as part of the proposed development. The area is popular with anglers, recreational paddlers, and recreational vehicle users. Seasonal residences are also located in proximity to the project site.

Short term impacts to the local aesthetics will be apparent during the construction phase of the project, though the preservation of the natural aesthetics of the waterway and surrounding area will be considered as part of the proposed development. Construction activities such as clearing, grading, blasting, pouring concrete, and installing structural steel and machinery will disturb the solitude of the site and be deemed unpleasant to those expecting a more natural outdoor experience but restoration activities (seeding, tree planting, etc.) will enhance site aesthetics after construction is complete.

Maintaining or enhancing vegetative buffers between the river, roads, and any ancillary works will be considered during detailed design to preserve the aesthetic quality of the area; proposed mitigation measures are provided in Table 33.

7.2.8. Noise

A hydroelectric generating station is largely unobtrusive in terms of its impact on the noise environment within the region it occupies. Most of the noise that occurs through operations originates inside the powerhouse and is mitigated by a powerhouse enclosure. The more likely source of noise associated with this project is during the construction phase. Sound levels within the area will also be influenced by natural processes such as the falling of water over rocks.

An initial acoustical analysis of the proposed Wabagishik Rapids GS, near Espanola, Ontario was completed using predicted sound emission levels and acoustical modeling to assess the potential impact of the single electrical transformer associated with the proposed site, with respect to the NPC Guidelines developed by the MOE.

In Ontario, the NPC guidelines are used for environmental noise assessments, specifically publications NPC-205, Sound Level Limits for Stationary Sources in Class 1 and Class 2 Areas (Urban), and NPC-232, Sound Level Limits for Stationary Sources in Class 3 Areas (Rural). The area surrounding the proposed facility is likely best categorized as a Class 3 environment, due to its remote location and the absence of human development or roadways. For equipment that could operate during both daytime and nighttime hours in a Class 3 environment, the "exclusionary minimum" limit is 40 dBA at any sound sensitive points of reception in the vicinity. Additionally, some types of sound have a special quality which may tend to increase their audibility and potential for disturbance or annoyance. For tonal sound, such as that typically emitted by electrical transformers, the MOE guidelines stipulate that a penalty of 5 dBA is to be added to the measured source level. In the subsequent analysis, a tonal penalty has been applied to the sound of the transformer.

Xeneca has identified three sound sensitive points of reception (private cottages) within 1,000 metres of the facility, as part of their preliminary feasibility work. The predicted sound emissions were assessed at each of the three locations, and are identified as POR1 through POR3, as listed in Table 34, below.

The only source at the facility anticipated to emit sound to the outdoors is a small, oil-filled transformer with a capacity of approximately 3.27 MW with integral cooling fans, located within 30 m of the proposed powerhouse. The sound power emission level of the transformer was calculated to be 88 dBA, and was input into a predictive computer model (Cadna-A version 4.3.143. The model is based on the methods from ISO Standard 9613-2.2 "Acoustics - Attenuation of Sound During Propagation Outdoors", which accounts for the reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures (or by topography and foliage where applicable).

The prediction results presented in Table 34 indicate that the sound levels from the proposed Wabageshik Rapids GS will be well within the applicable MOE sound level limits at the nearest sound sensitive points of reception, without the need for physical noise control measures. See also the "Initial Environmental Sound Study", in Annex I of this report for the predicted energy-equivalent (LEQ) sound level contours resulting from the sound emissions of the proposed facility.

Table 34: Predicted Equivalent Hourly Sound Levels, L_{EQ} [dBA]

Point of Reception	MOE Sound Level Limit	L_{EQ}
POR1 (230 m from transformer)	40 dBA	28 dBA
POR2 (490 m from transformer)	40 dBA	21 dBA
POR3 (600 m from transformer)	40 dBA	21 dBA

The analysis indicates no evidence of potential adverse impact relative to the noise guidelines of the MOE. More information is provided in the Initial Environmental Sound Study Wabagishik Hydro-Power Plant, Espanola, Ontario, by members of the consulting team in Annex I. A more detailed noise impact assessment is to be undertaken during the detailed design stage, as a precursor to the eventual application for an Environmental Compliance Approval for noise for the facility under Section 9 of the *Environmental Protection Act*.

7.2.9. Employment & Economy

Construction and operation of the project will generate a positive economic effect in Espanola, and the City of Greater Sudbury and surrounding communities providing opportunities for sourcing of construction material and employment.

Economic benefits will include employment during construction, expenditures on materials, equipment and services and contribution of renewable energy to the Provincial supply mix. The proposed Vermilion River - Wabageshik Rapids GS will have a total installed capacity of approximately 3.4 MW. Waterpower creates jobs, generates revenue for the taxpayers of Ontario, and is the longest lived and most reliable source of renewable electricity:

- Direct economic activity to build a waterpower project in Ontario is approximately $5 million per MW. Generally, about half of this amount is spent locally/provincially, in procuring construction labour & materials, consulting and legal services, trucking and other services such as accommodation, food and fuel.
- Direct job creation (construction) is estimated to be approximately 34,000 person hours of work. Indirect job creation is estimated to be approximately 51,000 person hours of work supporting the project and personnel.
- A significant return to the people of Ontario paid through Gross Revenue Charges (GRC) and provincial and federal income taxes. Return to the people of Ontario will continue past the 40 year contract, likely as long as the facility is in operation.

- Waterpower lasts. Many power plants built in the early 1900s are still in operation and with regular maintenance and upgrades can last for many generations. In comparison, the life span for other sources of renewable power is: nuclear 40 years, wind 20 years, solar 20 years.

7.2.10. Land Use/Land Tenure

The Wabageshik Rapids project footprint will be constructed entirely on Crown Land, while the access road/transmission corridor component of the project may impact on privately owned land. Within the General Use Area that encompasses the study area, the MNR Crown Land Use Policy Report for the area (G2033: Highways No 6 and No 17 Hinterlands Area) indicates that access road development and maintenance, for both new and existing roads, is permitted where required to provide access for resource management purposes. Furthermore, the development of commercial power development is also permitted (as evidenced by the release of these sites by MNR for commercial development). Therefore, the use of the site for waterpower production conforms to MNR's management guidelines for the area.

7.2.11. Fishing/Hunting

Recreational fishing opportunities may be slightly impacted during construction by limited access to the Wabageshik Rapids project site for safety reasons. Recreational fishing near the downstream bay and Wabagishik Lake is unlikely to be affected during construction of the proposed powerhouse development.

As a result of operational activity, changes to river flow patterns and safety concerns, recreational fishing near the proposed powerhouse development will be adversely impacted. Opportunities for recreational fishing will remain both upstream and downstream from the site location.

Hunting activities in the area might be temporarily interrupted during the period of construction as animals tend to avoid areas of high human activity. There will also be limited hunting opportunities in the immediate vicinity of the construction areas in order to protect the workforce. Warning signs will be placed along the entrance to the secondary access roads, alerting hunters of construction work at the sites. Following construction, improved access along the roads near the project will allow easier access for local hunters. No significant changes to large mammal populations are expected due to the project since abundant similar habitat is available in the surrounding area.

Hunting opportunities may be enhanced during the operational period due to improved access to potential hunting areas along the new access road and transmission line corridors. Operation of the facilities is not anticipated to have any significant adverse impact on game species;

therefore, no negative impact on hunting success as a result of operation of the project is anticipated to occur.

Xeneca's operations are not expected to have any significant impact on hunting activities since hunters would be able to target game species from various other locations near the project site. Game species have large territorial ranges and since the surrounding forest is large (>100 ha in size) and contiguous, it signifies that abundant similar habitat is available in the surrounding area (NRSI, 2012). Thus, it is anticipated that minimal impacts from habitat loss or disturbance of game species will result to areas surrounding the project site.

Members of the Ontario Federation of Anglers and Hunters indicated strong interest in working with Xeneca to resolve issues regarding fisheries.

If required in the future, Xeneca can participate in a stocking program but it is not believed that the Wabageshik Rapids GS project will significantly impact the population of fish species.

7.2.12. Trapping

There are three commercial traplines in the vicinity of the site location along the Lower Vermilion River. Xeneca anticipates minimal impacts to trapping activities as a result of the dam construction since very little habitat will be lost for furbearing species. At most, a short-term impact may occur during construction due to these species avoiding human activities.

Contact with local trappers via emails in January and August of 2011 have not raised any significant concerns.

7.2.13. Canoeing/Kayaking

Recreational use of the Vermilion River (e.g., canoeing, kayaking) in the project area will be affected to some degree during the construction period. Construction activities will be encountered by canoeists and kayakers that use the river and specific procedures will be adopted to ensure such recreational opportunities are maintained (e.g. signage will be used to advice recreational users of the river about construction hazards like construction traffic, blasting, etc.).

Boating or canoeing opportunities throughout the study area will likely be enhanced upstream due to the increases in water depth resulting from project inundation. Higher, more stable water levels will eliminate or minimize existing navigational hazards (e.g., boulders, dead wood) throughout much of the area, making boating potentially safer. Warning signs will be posted indicating that flow may change at any time and advising boaters to stay out of the immediate tailrace area. Implementation of the identified mitigation will reduce/minimize safety risks to the greatest extent possible.

Xeneca will make best effort to maintain a consistent Operating Plan level year around at the Wabageshik Rapids site to reduce impact to recreational users of the river.

7.2.14. Snowmobiling

The results of hydraulic modelling of the proposed inundation area indicated that the snowmobile bridge crossing the Vermilion River (approximately 500 m upstream of the proposed site of the Wabageshik Rapids GS) would not be affected by operations at the proposed facility. Additionally, the bridge will not be used to access the project site for construction or operation. Though no negative impacts to the bridge are anticipated, Xeneca nonetheless committed in writing to repairing the bridge should it be damaged due to construction or operation of the facility (see Section 6.4). Furthermore, during the detailed design phase, design engineers will create a quantifiable inspection chart for the Operations Manager to review on an annual basis.

The degree of impact of the access roads on the nearby snowmobile trail varies depending on the access route that is ultimately selected for the proposed Wabageshik Rapids GS. If the "New Road Option" (as described in Section 3.4) is selected, the access road would intersect with the snowmobile trail once, at a point approximately 1 km south of the proposed Wabageshik Rapids GS.

The impact on the snowmobile trail would be greater should the "Snowmobile Trail Road Option" be selected, which would see the access road running north of Elizabeth Lake and following the path of the existing snowmobile trail. As noted in the Power Line and Road Summary report in Annex VI, the bridge over Brazil Creek, west of Elizabeth Lake, has a maximum rated capacity of 10 tons. Should the Snowmobile Trail Road Option be selected, this bridge will need to be upgraded to a larger road bridge with highway capacity. In order to ensure continued snowmobile use of the bridge, a lane of unplowed snow will be retained along the full length of the bridge during the winter, if so desired by the snowmobilers.

North of the bridge over Brazil Creek, the Snowmobile Trail Road Option would run parallel to or near the snowmobile trail. In locations where the road would run immediately alongside the trail, a lane of unplowed snow would be retained for snowmobile use. Other areas would see the access road deviate away from the current snowmobile trail due to engineering requirements for the road (drainage, hill slope issues, etc.). Minor re-routing of the snowmobile trail may be required in specific locations, in order to minimize the number of times that the road and the trail intersect one another; such intersections may cause logistical complications for snow clearing and safety concerns for snowmobilers crossing directly over the access road. Should the Snowmobile Trail Road Option be selected, the intent will be to minimize the number of intersections to those that cannot be avoided (i.e. at the start and end of the common corridor).

With the maintenance of the snowmobile trail and/or a lane alongside of the access roads, snowmobile use of the general area will not be significantly impacted by the construction and operation of the Wabageshik Rapids GS.

7.2.15. Mining

Xeneca's operations are not expected to have any negative effect on mining activities since mining companies are subject to a '400' surface rights reservation around all lakes and rivers (OMNR, 2010c). Provisions, like the latter, in the Mining Act allow for the development of renewable energy (waterpower) on mining claims. Generally, waterpower and mining operations are compatible as they can share infrastructure (power lines/roads) and that a readily available source of reliable power to the mine is seen as a significant advantage.

7.2.16. Archaeological Resources

As indicated in Section 2.10.1, a pre-contact archaeological site ("Belmer Site") is located in the vicinity of the project site, but does not fall within the project's zone of influence. By adopting an avoidance strategy, the Belmer Site will remain undisturbed during the construction and operation of the Wabageshik Rapids GS, and will therefore not be impacted.

In order to further ensure that the site is not inadvertently disturbed during construction, various mitigation measures will be implemented, described below.

Prior to the start of construction activities, the site will be cordoned off with a clearly marked fence. Construction crews and other on-site staff will be briefed with regards to the purpose of the fence and provided with explicit instruction that no personnel or equipment are to venture beyond the fence, nor is the integrity of the fence to be compromised in any way.

Archaeological consulting staff will visit the site three times over the course of the construction activities in order to verify the integrity of the fence line and to ensure that construction activities are not crossing beyond the fence.

With the proper implementation of the avoidance strategy, no impacts to the Belmer site are anticipated.

7.3. Identified Aboriginal Community Considerations and Concerns

The Wabageshik Rapids project will have a very significant positive, long-term impact on the FN communities involved in a business to business relationship with Xeneca due to the economic benefits that will be accrue to these communities over the life of the project. These economic

benefits are expected to translate into improvements in standard of living, education and health care for those communities.

Xeneca also acknowledges to work together with those communities to address the rights, culture and concerns of all Aboriginal people since consultation with affected communities is a part of Xeneca's ongoing policy.

7.4. Specific Consultation Issues and Resolutions

Discussion on some of the key issues raised during the consultation process is presented in Section 6. A summary of the specific issues identified during the regulatory agency, government department and public and Aboriginal consultation process is presented in tabular format in Section 6.5, Aboriginal Engagement, under each specific community. An Issues and Concerns table is also included in Appendix E. The table identifies how resolution to each identified issue has been or may be resolved, and whether any outstanding issues or concerns remain. The issues are grouped based on the individual communities who could be affected by the undertaking.

Specific issues have been identified in Table 33 (Identified Issues and Management Strategies), and include issues focused on the following themes; spiritual, ceremonial, cultural and burial sites, traditional land and resources used for harvesting activities, employment, lands subject to land claims, and other identified issues.

7.5. Consideration of Accidents and Malfunctions

This section presents the issues specifically related to potential accidents and malfunctions during operation.

The environmental assessment of the undertaking must consider the effects to the environment if an accident or malfunction were to occur during the construction or operation of the project. Consideration must be given to such events as spills and leaks, power failures, toxic substances, and worker and public health and safety.

As the mitigation measures and best management practices detailed in Table 33 of this document will be implemented, it is unlikely that spills and leaks would occur during the construction period. The engagement of an environmental monitor to oversee construction activities should further ensure the prevention of releases of deleterious substances to the environment. Additionally, the health and safety of all contractors and construction crews on provincial lands will be subject to *Ontario Regulation 231.91* which governs construction projects in Ontario. The health and safety of operational staff at the generating station will be governed by the *Occupational Health and Safety Act*. Public access will be restricted during the construction activities at both the GS site and along the connection line. At the end of construction, a

permanent safety boom upstream of the powerhouse will direct recreational users of the river to the portage trail, allowing them to bypass the dam and re-enter the river downstream of the powerhouse and spillway.

Toxic substances are rarely employed at hydroelectric generating stations. Generally, only small quantities of normal industrial lubricants are required for operation. A diesel generator for emergency power supply at the generating station will be required, necessitating the installation of an above-ground storage tank (AST) for diesel fuel. The installation and operation of the AST will be subject to the *Technical Standards and Safety Act*, Ontario Reg. 213.01 (fuel oil).

A power failure at the generating station will result in the inability of the powerhouse to discharge water which will affect project revenues. Should this power failure occur during peak flow periods, the proponent will be responsible for ensuring that peak discharge can be passed downstream. During unscheduled/emergency shut-downs of the facility, minimum flows will continue to be provided into the river downstream of the Wabageshik Rapids GS. This can be accomplished through the installation of a powerhouse bypass valve that will allow a continuous release of flow until normal operations resume. Alternately, a special turbine-generator package can be used that would allow the continued passage of flow through the turbines even during an emergency shut-down. The final selection of either the powerhouse bypass valve or the turbine-generator package will occur during the detailed engineering design process.

8. EFFECTS OF ENVIRONMENT ON THE PROJECT

The potential exists for the environment to impact the project. These effects may be of short duration such as a heavy rainfall event, or longer duration such as the anticipated effects of climate change on the project.

Disruptions in energy connection and generation would result in decreased economic returns for the proponent. The powerhouse will be equipped with a back-up generator to ensure that station service power can be restored to the facility should a grid failure occur. However, the facility cannot be operated (i.e. generation cannot recommence) until the electrical grid can accept the power generated. In this situation no water would be passed through the powerhouse but would be directed through the by-pass designed into the facility. The design of this by-pass will represent at least the pre-project capacity of the natural rapids. This aspect of the approval process will be dealt with after the environmental assessment process is completed, as the detailed engineering design is being finalized.

8.1. PRECIPITATION AND FLOODING

Operations during extreme events, such as floods, droughts and safety emergencies may need to deviate from the normal operating parameters to manage flows and mitigate impacts. Proposed operational changes in response to floods are described in Section 5.7.

It should be noted that the facility is not designed to mitigate the effects of naturally occurring events such as floods and droughts. However, there are circumstances where the existence of the facility can either aid in managing such an event or pose an additional risk. The flood risk aspects are managed, in part, through the government approval under the *Lakes and Rivers Improvement Act* of the engineering plans and specifications for the design of the facility. The purpose of this process is to ensure that the flood passage capacity of the facility is adequate and that the risk to property and public safety is duly considered. This aspect of the approval process will be dealt with after the environmental assessment process is completed and when the detailed engineering design is being finalized.

8.1.1. Extreme Winter Conditions

Extreme cold weather conditions may lead to a build-up of ice at the intake that could necessitate plant shut-down and an interruption to the delivery of electricity to the provincial supply grid. Such an interruption will affect project revenues until the ice is naturally or artificially cleared.

8.1.2. Extreme Summer Conditions

Drought conditions could necessitate the shut-down of the facility and an interruption to the delivery of electricity to the provincial supply grid as a result of reduced flows within the river. During such time, all flows entering the headpond will be released into the river downstream and there will be no manipulation of flows. As the project cannot mitigate drought conditions, such events will result in a loss of revenue to the proponent.

8.1.3. Lightning Strikes

A direct hit on the facility may lead to facility shut-down and prolonged interruption to the delivery of electricity to the provincial supply grid. As noted in Section 7.5 above, flows will continue to be provided into the river downstream and a loss of project revenues will occur until normal operations can resume.

8.1.4. Accidental Fires

Lightning strikes as well as manmade fires could result in uncontrolled forest/brush fires which may interrupt the operation of the facility and the delivery of electricity to the provincial supply grid. Forest fires may also limit the ability of personnel to access the facility to conduct operations or maintenance.

8.1.5. Earthquakes

The continual shifting of large segments of the earth's crust, called tectonic plates, causes more than 97% of the world's earthquakes. Eastern Canada is located in a relatively stable continental region within the North American Plate and, as a consequence, has a relatively low rate of earthquake activity. Nevertheless, large and damaging earthquakes have occurred here in the past, and will inevitably occur in the future.

The project area is located in the Northeastern Ontario Seismic Zone, and according to NRCan (http://earthquakescanada.nrcan.gc.ca) this zone experiences a very low level of seismic zone activity. NRCan reports that from 1970 to 1999, on average, only one or two magnitude 2.5 or greater earthquakes were recorded in this area, and two magnitude 5 earthquakes (northern Michigan and northwest of Kapuskasing) have occurred in this region. The location of the project in this low seismic activity area presents a low potential for the facility to be affected by this type of geological event.

8.1.6. Climate Changes and Other Weather Related Effects

According to the National Round Table on the Environment and the Economy (www.nrtee-trnee.com), widespread impacts are expected across Canada as a result of increasing temperatures and moisture levels. Among the changes predicted, the Round Table is forecasting that Ontario will experience increased disruptions to energy generation and connection. Among the many predictions offered, there includes a doubling in the frequency of extreme rain events and increasing costs to providing community services in Canada during the 21st century. When there is advance warning is received that an extreme rain/flood event may occur, the operation of the facility will be adjusted in advance of the flood peak to maximize its ability to pass water and provide minimal obstruction to the passing of flood waters. Xeneca may consult with other waterpower operators on the system to ensure a collaborative effort in this regard.

9. COMPENSATION REQUIREMENTS UNDER FEDERAL AND PROVINCIAL LEGISLATION

Identified effects that cannot be avoided, prevented or where mitigation measures were unable to effectively reduce the magnitude and duration of the impact to inconsequential levels, or repair the situation post-impact to return to a pre-impact state will need to be compensated for through other means in order to off-set the ecological impact of the effect. There are circumstances for this proposed project where offsetting the impact through other means is necessary. The compensation situation and measures that will be used are discussed in this section.

Aquatic Habitat Compensation

To obtain permits from DFO and MNR under the federal *Fisheries Act* and the provincial *Lakes and Rivers Improvement Act*, respectively, fish habitat compensation is required. The compensation habitat must also comply with the provincial *ESA* regulations for Lake sturgeon habitat, as this species is designated as threatened on the Species at Risk list in Ontario.

The inundation resulting from the proposed Wabageshik Rapids GS project is anticipated to have permanent residual effects on aquatic species and habitat within the project's zone of influence, as well as impact on First Nation and recreational fisheries. No compensation is required for Wabagishik Lake as it will not be impacted by new inundation.

Compensation will be required for three areas; the facility footprint, riverine habitat within the inundated area, and a horseshoe-shaped riffle habitat downstream of the dam that will be dewatered more frequently than under existing operations. The habitat areas requiring compensation include 6,840 m^2 for the inundation area (two separate riffle habitats), the pool at the dam site (500 m^2) and the horseshoe-shaped area downstream of the dam (1,000 m^2). Compensation is required to mitigate potential effects on spawning areas by offsetting the loss of habitat functionality, and to lessen the significance of the impacts upon aquatic species and habitat.

Habitat within the inundation area will change from riverine to lacustrine, and spawning habitat for Walleye and Lake sturgeon will be altered. The affected habitat is anticipated to include impacts to habitat critical to the life history requirements of several aquatic species including suitable spawning habitat for Lake sturgeon, Walleye and species in the sucker family. The increase in depth resulting from inundation is anticipated to play a larger role in impacting this habitat (particularly the downstream riffle area, near the snowmobile bridge) than the associated decrease in velocity. However, the two large riffle areas are nonetheless anticipated to retain some spawning habitat function.

Construction of the spillway, powerhouse and tailrace will result in permanent changes to aquatic habitat. The area of impact will include the powerhouse (400 m^2), the spillway (200 m^2) and the tailrace (400 m^2). Construction of the powerhouse and spillway (a total footprint of 600 m^2) will permanently impact a 500 m^2 pool that is currently utilized as refuge areas for Walleye, Lake sturgeon and Redhorse suckers that spawn in adjacent habitats. As for the tailrace, cobble substrate on the channel bottom of the tailrace area will be replaced following tailrace construction, to maintain the existing substrate characteristics. Tailrace design suitability for spawning will be evaluated using the results of the post-EA two-dimensional modelling.

Intermittent operations in a 1000 m^2, horseshoe-shaped area of riffle habitat 100 m downstream of the spillway will become dewatered more frequently than under existing operations. This will result in a loss of benthic invertebrate production and a change in the benthic community. Although the focus of the proposed compensation habitat is on fish spawning, the creation of spawning habitat would also benefit benthic invertebrates by providing habitat for these organisms.

The fish habitat compensation will be designed to function as suitable spawning habitat for Walleye and Lake sturgeon. The design will be based on the results of the post EA two-dimensional modelling which will provide suitable depth, velocity and substrate size for the specific species.

The compensation plan (refer to Annex III for details) is intended to meet the requirements of the provincial *ESA* as it applies to Lake sturgeon and MNR Fisheries Management Objectives for Walleye.

In order to maintain the life cycles of Lake sturgeon, Walleye, and sucker species within the project area, the proposed compensation plan will replace spawning habitat function that will be lost through inundation. For Walleye, the MNR has previously indicated that spawning habitats are available within Wabagishik Lake, and its resident population will be sustained without fish passage (see the July 19, 2012 meeting minutes in Appendix C). Existing recruitment from the spawning habitat in Wabageshik Rapids serves the Vermilion and Spanish River system downstream, thus it is appropriate to locate the compensation habitat downstream in the Vermilion River.

The design parameters will be based primarily on information on spawning habitat preferences for these species. Habitat compensation will be located in the Vermilion River in as many as three locations, listed here in order of priority:

1. At the Wabageshik Rapids tail water area, beginning at the proposed dam and extending 300 m downstream to the large bay, downstream of the proposed Wabageshik Rapids GS;
2. At the bay downstream of the downstream limit of Wabageshik Rapids, where fastwater velocities extend into the bay; and
3. At Graveyard Rapids, located 3 km downstream of Wabageshik Rapids.

Following habitat compensation, monitoring will be completed for the first five years of operation, in order to determine whether or not the newly created spawning habitat for Walleye and Lake sturgeon is functioning as intended. Proposed monitoring methodologies for fish spawning will include habitat measurements, visual spotlight surveys, egg matting, drift netting for Lake sturgeon larvae, and capture of adult fish; see Section 12 for further monitoring details.

Further information on aquatic compensation can be found in the Preliminary Fish Habitat Compensation Plan in Annex III.

Other Potential Permitting Requirements Under the *Endangered Species Act*

Roads or development within 125 m of locations where Eastern Whip-poor-will have been identified may trigger the need for a permit under the *Endangered Species Act*. Mitigation measures for Eastern Whip-poor-will including minimizing the road corridor, revegetating temporary roads after construction, completion of road construction during the non-breeding season (mid August to early May) to minimize noise disturbances. A modification in driver behaviour, such as reducing traffic through access controls, restricting speed, and restricting night use of roads during the nesting season will aid in their protection. Any additional compensation measures required will be identified through the permitting process. Further, line and road development may trigger the need for a permit under the *Endangered Species Act*. Mitigation measures may need to be applied for *Myotis* sp. where they have been confirmed on acoustic recordings and where hibernacula or roosting trees are to be removed or destroyed. Clearing of the proposed road corridor during the non-breeding season will avoid killing or disturbance of bats at maternal colonies.

10. RESIDUAL ADVERSE EFFECTS AND SIGNIFICANCE

A summary of the specific issues identified during the regulatory agency and public consultation process is presented in Table 33. Those issues that have been marked as a residual effect in the last column in Table 33 have been carried over to Table 35: Residual Environmental Effects and Significance (found below) for further analysis.

The residual effects of a project are those that are expected to remain despite the application of mitigation measures and compensatory requirements. Section 4.3.1 of the Class Environmental Assessment for Waterpower Projects (April 2012) provides criteria for assessing significance:

Value of Resource

The value or importance placed on the resource by stakeholders or society at large as determined through consultation and the consideration of overall environmental requirements. The value may be related to the relative abundance of the resource, the interest of participating parties, etc.

High — Value of the resource which will be affected is considered high. The resource has some form of regulatory status or protection, generates a high level of public interest, is considered scarce or is essential to the integrity of the regional economic and/or ecological environment.

Medium — Value of the resource which will be affected is neither high nor low. The resource is acknowledged as an important part of the regional ecological and economic environment, but is not essential. Interest has arisen through consultation but has not been a focus issue.

Low — Value of the resource which will be affected is considered low. The resource is abundant, does not significantly contribute to the regional economy or environment, and no concerns have arisen through consultation.

Magnitude

The magnitude of an effect refers to the extensiveness, scale, degree, or size of that effect. As the assessment of this criterion has a high potential to be subjective/qualitative, and measures of scale vary between effects, each level of magnitude has several specific measures for the means of clear definition. When possible, pre-established quantitative scales of magnitude specific to a given effect should be used and referenced. Mitigation measures and strategies or conditions may affect the magnitude of a residual effect to some degree.

High	Effect will exceed regulatory or guideline criteria and/or remains controversial by the majority of stakeholders and/or is deemed high by expert judgment/historic precedence, and/or exceeds the carrying capacity of the surrounding ecosystem.
Moderate	Effect will noticeably change or exceed existing conditions. The change remains - within regulatory or guideline criteria, is capable of being absorbed by the surrounding ecosystem, and is not considered controversial by the majority of stakeholders
Low	Effect will only be evident at or slightly above existing conditions, will be well within the carrying capacity of the surrounding ecosystem, and will have low social impact as shown through public consultation.

Geographic Extent

The geographic area over which the effect would occur. This can relate to either a linear distance (km) or area (km^2), depending on the issue or effect being described.

<1	Effect will be limited to less than a 1 km (distance/area) from the project site
1-10	Effect will be limited to between 1 and 10 km (distance/area) from the project site
11-100	Effect will be limited to between 11 and 100 km (distance/area) from the project site
101-1,000	Effect will be limited to between 101 and 1,000 km (distance/area) from the project site
1,001-10,000	Effect will be limited to between 1,001 and 10,000 km (distance/area) from the project site
>10,000	Effect will be extend beyond 10,000 km (distance/area) from the project site

Frequency and Duration

The frequency of when an effect might occur intermittently over a given period of time. Generally, events that occur less frequently or for a more limited period of time are considered less significant.

Frequency:

<11	The effect will occur less than 11 times per year
11-50	The effect will occur between 11 and 50 times per year
51-100	The effect will occur between 51 and 100 times per year
101-200	The effect will occur between 101 and 200 times per year
>200	The effect will occur more than 200 times per year
Continuous	The effect will be occur continuously

Duration:

<1	The effect will occur for less than a month
1-12	The effect will occur for between 1 month and a year
13-36	The effect will occur for between 1 and 3 years
37-72	The effect will occur for between 3 and 6 years
>72	The effect will occur for more than 6 years

Reversibility

Whether or not the effect is reversible if the activity or component of the project which is causing the effect is halted, altered or removed. Irreversible impacts are considered more significant than reversible impacts.

Reversible	Existing conditions would be re-established if the cause of the effect is halted, altered or removed
Irreversible	Existing conditions would not be re-established if the cause of the effect is halted, altered or removed. In the event that reversibility is unknown, the effect should be considered irreversible.

Waterpower facilities typically have a lifespan in excess of 80 years and can be refitted to last decades longer. The longevity of waterpower projects mean that, once constructed, they are more likely to be upgraded or refitted rather than decommissioned. As a result, when considering the reversibility of residual effects, the physical footprint of the facilities and the inundation area

are considered as permanent and irreversible. Additionally, those project components or activities that are required for maintenance or public safety are likewise considered permanent while the facility exists. If these components were to be decommissioned and removed it is conceivable that the environment would return to its natural state but, when compared to the timeframe for other project effects, these effects are not considered reversible. Other activities or effects which could be modified or halted through changes to management or operations or the implementation of further mitigative measures are considered reversible.

Ecological/Social Context

The effect may be considered more or less significant when considered against an environment that is untouched or has been previously impacted by other activities or issues. The focus during the determination of the significance of the effect is on the change brought about on the existing environment by the project. Therefore, changes to a relatively pristine environment are considered more significant than changes to a previously impacted environment.

Relatively Pristine	The value or resource being affected has not been previously influenced
Previously Impacted	The value or resource being affected has already been influenced by other source(s)

Likelihood of Effect

Some mitigation measures may address the potential of residual effects by reducing the likelihood of their occurrence rather than by reducing the magnitude of the effect.

High	The effect is highly likely to occur
Medium	The effect may occur
Low	The effect is still unlikely to occur

By applying and considering all of the listed criteria, residual effects can be classified as either **Not Significant**, or **Significant** within the context of the project and the environment in which it is proposed. The project may also have residual effects which are considered **Positive** which should be considered and weighed against the potential significant adverse effects.

An assessment of the residual effects (including the positive impacts) of the proposed undertaking are presented in Table 35.

TABLE 35: Residual Environmental Effects and Significance

Environmental Component	Issue	Residual Effect (Yes/No)	Value of Resource	Magnitude	Geographic Extent (km)	Duration (months) or Frequency	Reversibility	Ecological/ Social Context	Likelihood of Effect	Significance
General Natural Environment										
Air quality	Noise from operation of electrical generator and transformer at powerhouse and electrical connection	Yes	High	Low	< 1	Continuous	Reversible	Previously Impacted	High	Not Significant
	Exhaust emissions from equipment and vehicles (construction and operation of facility)	Yes	High	Low	1-10	Noise Effects possible during construction. During operation, would only occur rarely as a result of operation of the generator during emergency situations.	Reversible	Previously Impacted	High	Not Significant
	Exhaust emissions, dust and noise from trucks transporting concrete to the project site	Yes	High	Low	1-10	13-36	Reversible	Relatively Pristine	High	Not Significant
	GHG Offsets	Yes	High	Low	> 10,000	Continuous	Reversible	Previously Impacted	High	Positive
	Dust emissions from construction activities and vehicles	Yes	High	Low	1-10	13-36	Reversible	Relatively Pristine	High	Not Significant
Water quality (surface and groundwater)	Surface water - general construction activities along shoreline of waterway at facility and water crossings along transmission line route and access roads	Yes	High	Low	1-10	13-36	Reversible	Relatively Pristine	Low	Not Significant
Water quality (surface and groundwater)	Surface water - In-water works construction and removal of the cofferdam: potential for excess sediment to be suspended and carried downstream by river flow	Yes	High	Low	11-100	1-12	Reversible	Relatively Pristine	Low	Not Significant
	Potential for impacts to wetland complex between Brazil and Elizabeth Lakes during road construction (for the "Snowmobile Trail Road Option")	Yes	High	Low	< 1	1-12	Reversible	Relatively Pristine	Low	Not Significant
	Increased potential for algal blooms due to increased water retention time	Yes	High	Low	1-10	1-12	Reversible	Relatively Pristine	Low	Not Significant
	Contamination from spills or leaks of hazardous substances	Yes	High	Low	1-10	13-36	Reversible	Relatively Pristine	Low	Not Significant
	Surface water - Potential increase in suspended sediment due to fluctuation of water levels upstream and fluctuation of flows downstream.	Yes	High	Low	1-10	possible for up to 9 months of every year	Reversible	Relatively Pristine	Low	Not Significant
Species at Risk	Impact to habitats of identified Species at Risk due to construction and operation of facility	Yes	High	Low	1-10	Continuous	Irreversible	Relatively Pristine	High	Not Significant
	Impact to Eastern Whip-poor-will and Common Nighthawk in powerhouse, yard and substation area	Yes	High	Low	< 1	Continuous	Irreversible	Relatively Pristine	Medium	Not Significant

Environmental Component	Issue	Residual Effect (Yes/No)	Value of Resource	Magnitude	Geographic Extent (km)	Duration (months) or Frequency	Reversibility	Ecological/ Social Context	Likelihood of Effect	Significance
Species at Risk	Impact to habitat for Brown myotis and Northern myotis within the project footprint, inundation area and access road areas (maternity roosting habitat in inundation area)	Yes	High	Low	1-10	Continuous	Irreversible	Relatively Pristine	Low	Not Significant
	Impact to species of special concern, Eastern milksnake	Yes	High	Low	1-10	Continuous	Irreversible	Relatively Pristine	Low	Not Significant
	Impact to species of special concern (Eastern wood pewee) in planned powerhouse, yard and substation and within inundation area and road access areas	Yes	High	Low	1-10	Continuous	Irreversible	Relatively Pristine	Low	Not Significant
	Impacts to Lake sturgeon spawning habitat	Yes	High	Medium	1-10	Continuous	Reversible	Relatively Pristine	Medium	It is expected that compensatory measures will reduce the significance of this residual effect to "Not Significant"
	Impact to suitable habitat for Blanding's Turtle and Snapping Turtle due to operation of facility (including potential impact to wintering areas).	Yes	Medium	Low	< 1	1-12	Reversible	Relatively Pristine	Low	Not Significant
	Impact on snake and turtle species (including Species at Risk) due to development of road corridor	Yes	High	Low	11-100	Continuous	Reversible	Previously Impacted	Medium	Not Significant
	Impact of road corridor development on forest nesting birds (including Whip-poor-will, a SAR).	Yes	High	Low	1-10	1-12	Reversible	Previously Impacted	Medium	Not Significant
Species of Conservation Concern	Impact to suitable habitat for common snapping turtle due to operation of facility	Yes	Medium	Low	< 1	1-12	Reversible	Relatively Pristine	Medium	Not Significant
Significant earth or life science features	Potential for two provincially significant wetlands within 500 m of lines and roads (one for each road option)	Yes	Medium	Low	1-10	Continuous	Reversible	Relatively Pristine	Medium	Not Significant
Land subject to natural or human made hazards	Potential for spring ice damming and/or flooding on Wabagishik Lake	Yes	High	Low	1-10	1-12	Reversible	Relatively Pristine	Low	Not Significant
Terrestrial wildlife (numbers, diversity, distribution)	General disturbance to habitat during construction and maintenance of facility (dam, powerhouse, etc.)	Yes	Medium	Low	11-100	Continuous	Reversible	Relatively Pristine	High	Not Significant
	Access road construction - habitat fragmentation	Yes	Medium	Medium	1-10	Continuous	Reversible	Relatively Pristine	High	Not Significant
	Power Line Construction	Yes	Medium	Low	< 1	Continuous	Reversible	Relatively Pristine	Medium	Not Significant

Environmental Component	Issue	Residual Effect (Yes/No)	Value of Resource	Magnitude	Geographic Extent (km)	Duration (months) or Frequency	Reversibility	Ecological/ Social Context	Likelihood of Effect	Significance
Terrestrial wildlife (numbers, diversity, distribution)	Impacts related to the creation of the facility and headpond	Yes	Medium	Low	1-10	Continuous	Irreversible	Relatively Pristine	High	Not Significant
	Operational effects on Significant Wildlife Habitats, including osprey and bald eagle foraging habitat and turtle overwintering habitat.	Yes	Medium	Low	< 1	1-12	Reversible	Relatively Pristine	Low	Not Significant
	Impacts related to construction activity deterring deer from crossing the river in proximity to the site	Yes	Medium	Medium	< 1	13-36	Reversible	Relatively Pristine	High	Not Significant
	General disturbance to wildlife	Yes	Low	Low	11-100	During construction period and once every few years for maintenance along the connection line corridor and access corridor	Reversible	Previously Impacted	Medium	Not Significant
	Access road impact on bat foraging (traffic noise and forest canopy area)	Yes	Medium	Low	1-10	Continuous	Reversible	Relatively Pristine	Low	Not Significant
Natural vegetation and habitat linkages	Effects on vegetation and habitat during connection line and access roads ROWs construction and maintenance	Yes	Medium	Low	11-100	During construction period and once every few years for maintenance along the connection line corridor and access corridor	Reversible	Relatively Pristine	High	Not Significant
	Downstream operational impact on deer crossing to access overwintering habitats in early winter and disperse in early spring.	Yes	Medium	Low	1-10	1-12	Reversible	Relatively Pristine	Low	Not Significant
	Access road impact on deer yarding in Elizabeth Lake area	Yes	Medium	Medium	1-10	1-12	Reversible	Previously Impacted	Low	Not Significant
	Impact on aquatic vegetation in bay below Wabageshik Rapids and downstream along riverbanks as a result of water level fluctuations	Yes	Medium	Medium	1-10	Continuous	Reversible	Relatively Pristine	High	Not Significant
Aquatic and Riparian Ecosystem										
Shoreline Dependent Species	Facility construction activities impacts on shoreline habitats	Yes	Medium	Low	1-10	Continuous	Irreversible	Relatively Pristine	High	Not Significant
	Impacts to species and habitat in Wabagishik Lake associated with water level fluctuations	Yes	Medium	Low	11-100	Continuous	Reversible	Relatively Pristine	Medium	Not Significant

Environmental Component	Issue	Residual Effect (Yes/No)	Value of Resource	Magnitude	Geographic Extent (km)	Duration (months) or Frequency	Reversibility	Ecological/ Social Context	Likelihood of Effect	Significance
Fish Habitat	Impact on horseshoe-shaped area located 100 m downstream of spillway due to fluctuating water levels	Yes	Medium	Low	< 1	> 200	Reversible	Relatively Pristine	High	It is expected that compensatory measures will reduce the significance of this residual effect to "Not Significant"
	Inundation effects on 6,840 m^2 of lake sturgeon, walleye and sucker spawning habitat in proposed headpond as a result of inundation of riverine habitat altering it to lacustrine habitat.	Yes	High	Medium	1-10	Continuous	Irreversible	Relatively Pristine	High	It is expected that compensatory measures will reduce the significance of this residual effect to "Not Significant"
	Construction of in-water facility components. The construction of the facility will result in the alteration or permanent loss of aquatic habitat	Yes	High	Medium	< 1	Continuous	Irreversible	Relatively Pristine	High	It is expected that compensatory measures will reduce the significance of this residual effect to "Not Significant"
	Temporary impacts and loss of habitat related to the construction of cofferdams	Yes	High	Medium	< 1	13-36	Reversible	Relatively Pristine	High	Not Significant
	Impacts to fish and benthic invertebrate habitat within variable flow reach due to variable flows and water levels resulting from modified run-of-river operations	Yes	Medium	Low	< 1	1-12	Reversible	Relatively Pristine	High	Not Significant
Fish Migration	Construction of the dam represents a potential barrier to the upstream movement of fish	Yes	Medium	High	1-10	Continuous	Irreversible	Relatively Pristine	High	It is expected that compensatory measures will reduce the significance of this residual effect to "Not Significant"
	Impacts to downstream passage of larval and adult fish due to decreased flows in the variable flow reach	Yes	Medium	Medium	1-10	Continuous	Reversible	Relatively Pristine	High	Not Significant

Environmental Component	Issue	Residual Effect (Yes/No)	Value of Resource	Magnitude	Geographic Extent (km)	Duration (months) or Frequency	Reversibility	Ecological/ Social Context	Likelihood of Effect	Significance
Fisheries	Impacts to fisheries within the project zone of influence	Yes	High	Medium	1-10	Continuous	Reversible	Relatively Pristine	High	It is expected that compensatory measures will reduce the significance of this residual effect to "Not Significant"
Fish injury or mortality	Fish impingement or entrainment resulting in injury or mortality	Yes	High	Low	< 1	Continuous	Irreversible	Relatively Pristine	High	Not Significant
	Fish injury or mortality as a result of cofferdam placement and dewatering	Yes	High	Low	< 1	13-36	Irreversible	Relatively Pristine	Low	Not Significant
Erosion and sedimentation	Operation - Increased shoreline erosion due to fluctuations in water levels in the headpond and variable flow reach	Yes	High	Low	1-10	Continuous	Reversible	Relatively Pristine	Low	Not Significant
	Deposition of sediment behind the dam due to headpond creation	Yes	Low	Low	< 1	Continuous	Reversible	Relatively Pristine	Low	Not Significant
Water levels, flows and movement (surface water)	Creation of headpond and fluctuation in levels/flows - project will result in the creation of a headpond extending approximately 800 m upstream up to Wabagishik Lake making the project lake-coupled.	Yes	Medium	Medium	1-10	Continuous	Reversible	Relatively Pristine	High	Not Significant
	Variation in flows within the downstream variable flow reach	Yes	Medium	Medium	1-10	Continuous	Reversible	Relatively Pristine	High	Not Significant
Water Temperature	Changes to thermal regime of waterway within headpond as a result of inundation and temporary storage	Yes	Medium	Low	< 1	Continuous	Reversible	Relatively Pristine	Low	Not Significant
Drainage, flooding and drought patterns	Alteration from natural patterns	Yes	Medium	Low	< 1	frequency dependant on flood event frequency	Irreversible	Relatively Pristine	Low	Not Significant
Aboriginal Community Considerations										
Traditional land or resources used for harvesting activities	Concerns that the construction and operation of the Project will impact migration of culturally important aquatic species such as Lake Sturgeon. Broader field work on sampling and on fish passage for Lake Sturgeon has been requested.	Yes	High	Medium	1-10	Continuous	Irreversible	Relatively Pristine	Medium	It is expected that compensatory measures will reduce the significance of this residual effect to "Not Significant"

Environmental Component	Issue	Residual Effect (Yes/No)	Value of Resource	Magnitude	Geographic Extent (km)	Duration (months) or Frequency	Reversibility	Ecological/ Social Context	Likelihood of Effect	Significance
Traditional land or resources used for harvesting activities	Construction of the dam will present a barrier to navigation by canoe and may conflict with traditional lifeways of communities. Elders have recalled the use of the river as an important travel corridor to Sagamok and the North Channel Metis.	Yes	Medium	Low	< 1	Continuous	Irreversible	Relatively Pristine	High	Not Significant
	Increased access to hunting, fishing, trapping and other gathering activities due to new road access.	Yes	High	Low	1-10	Continuous	Reversible	Relatively Pristine	High	Positive
	Habitat changes as a result of the project may result in changes in population of large game such as moose and deer and small mammals (rabbits) which communities rely on for food and other products	Yes	Medium	Low	1-10	Continuous	Reversible	Relatively Pristine	Low	Not Significant
	Clarity of water may be affected by the project through sediment and erosion issues, which would impact an important cultural and spiritual value for many communities.	Yes	High	Low	1-10	possible for up to 9 months of every year	Reversible	Relatively Pristine	Low	Not Significant
	Quality of water may be affected by the project due to mercury levels.	Yes	High	Low	11-100		Irreversible	Relatively Pristine	High	Not Significant
Employment	Construction and operation of the facility and ancillary works (lines and roads) may provide economic and job opportunities to aboriginal community companies, entrepreneurs and members	Yes	High	Medium	1-10	13-37	Reversible	Relatively Pristine	High	Positive
Economic development	Ontario's *Green Energy Act*, MNR's Site Release Policy and OWA Waterpower Class EA consultation & accomodation and Aboriginal Community assertions define or mandate economic participation and benefits to communities who will be impacted by project development.	Yes	High	High	101-1000	Continuous	Reversible	Relatively Pristine	High	Positive
Land and Resource Use										
Access	Increased access as a result of upgrades or maintenance of area access roads and bridges will reduce the remote aspect of the general project area	Yes	High	Low	1-10	Continuous	Reversible	Previously Impacted	High	Not Significant
Access	Facility construction will lead to reduced access to land and water at the project location itself	Yes	Medium	Low	< 1	Continuous	Reversible	Relatively Pristine	High	Not Significant

Environmental Component	Issue	Residual Effect (Yes/No)	Value of Resource	Magnitude	Geographic Extent (km)	Duration (months) or Frequency	Reversibility	Ecological/ Social Context	Likelihood of Effect	Significance
Navigation	The Vermilion River is a recognized canoe route and construction/inundation/ variable flows may alter navigational access within the project zone of influence	Yes	Medium	Medium	< 1	Continuous	Reversible	Relatively Pristine	High	Not Significant
Forestry	Harvesting of merchantable timber during construction	Yes	High	Medium	11-100	13-36	Irreversible	Relatively Pristine	High	Positive
Social and Economic										
The location of people, businesses, institutions or public facilities	Disruption to access, schedules and activities	Yes	High	Low	11-100	13-36	Reversible	Previously Impacted	High	Not Significant
Employment - Local and regional labour supply	Construction activities will support direct and indirect local employment	Yes	High	High	101-1000	13-36	Reversible	Previously Impacted	High	Positive
Public health and/or safety	Impacts for navigation and recreation associated with facility operation	Yes	Medium	Low	< 1	Continuous	Reversible	Relatively Pristine	High	Not Significant
Aesthetic image of the surrounding area	Powerhouse and inundation of falls	Yes	Medium	Low	< 1	Continuous	Reversible	Relatively Pristine	High	Not Significant
Energy/Electricity										
Reliability	Voltage support	Yes	High	Low	> 10,000	Continuous	Reversible	Previously Impacted	High	Positive
Electricity flow patterns	Power flow system	Yes	High	Low	1001-10,000	Continuous	Reversible	Previously Impacted	Low	Not Significant

10.1. RESIDUAL NATURAL HERITAGE EFFECTS

An analysis was undertaken to determine cumulative effects associated with the interaction between each known residual effect of the project and other past, present and future planned projects and activities within the study area.

Air Quality

Impacts to air quality associated with the project (dust, odour, exhaust, etc.) are all expected to occur mainly during the construction phase of the project and will be curtailed during operation. Given the mitigative measures which will be taken and the remote nature of the project these impacts are anticipated to be both short term and minor and therefore not significant.

Additionally, as a modified run-of-river facility, the project will generate sustainable and renewable energy and, in combination with other green energy projects, contribute to the improvement of air quality and public health in Ontario by facilitating and compensating for the shutdown of coal fired generation facilities throughout the province.

Water Quality

As with air quality, residual impacts may occur to water quality during construction activities. In order to mitigate the risk of sediment from construction being washed into the river, standard construction best management practices as well as sediment and erosion control measures will be implemented. These include measures such as the use of cofferdams and silt fencing, minimizing the removal of riparian vegetation and monitoring the turbidity of water close to the construction sites. With the proper implementation of sediment and erosion control measures, residual effects to water quality during construction are anticipated to be minimal.

Flow and Inundation Effects

An important residual effect of the proposed Wabageshik Rapids GS will occur to flows and levels in the ZOI. For the lifetime of the facility, flows and levels in the Vermilion River between the weir and the outlet of Wabagishik Lake will be slower and deeper compared to pre-project conditions. While the facility will operate such that its headpond will follow the natural level in Wabagishik Lake, water levels in the lake are anticipated to experience a residual effect up to a range of ± 5 cm around its normal daily level. However, this residual effect is anticipated to be minor, as the lake currently experiences wind-induced waves and seiche effects exceeding 5 cm.

Downstream of the facility, residual effects to flows and levels will be observed down to the confluence of the Vermilion River with the Spanish River whenever the Wabageshik Rapids GS is operating in modified run-of-river mode. Downstream of this confluence, these residual effects

are not anticipated to be distinguishable from current conditions, as water levels in that area of the Spanish River are influenced by operations at the Domtar dam and the Nairn dam.

Disturbance of Terrestrial Wildlife and Vegetation

The construction and operation of Wabageshik Rapids facility will result in an increase in traffic in local access roads as well as the construction of additional roads and connection line ROW. In combination with the existing roads and local activity these activities will have the potential to disturb terrestrial wildlife. While construction activity will result in higher traffic volume and activity, it will not continue once the project is operational. Route selection for connection lines and roads has been sited along existing roads wherever possible, and the lines and roads will follow the same corridor in order to minimize their total footprint.

The construction of the Wabageshik Rapids GS and its ancillary components will result in the permanent loss of terrestrial habitat in their immediate footprint. However, due to the relatively large availability of similar habitat in the surrounding area, the residual effect of this loss of terrestrial habitat is expected to be minimal.

Alteration and/or Destruction of Fish Habitat

As noted in Sections 7.1.5 and 9, loss of habitat functionality is anticipated for 6,840 m^2 of the riverbed in the proposed inundation area, 500 m^2 at the pool near the dam, and 1,000 m^2 in the horseshoe-shaped area downstream of the dam, representing a significant negative residual effect of the project. The creation of compensation habitat in the Vermilion River at a location downstream of the Wabageshik Rapids GS is proposed in order to offset this negative impact.

Alteration of Fish Passage

The construction of the Wabageshik Rapids GS will render the rapids impassable to any fish that may currently be migrating up that portion of the Vermilion River, thus representing a significant residual effect on fish passage. However, Xeneca believes that fisheries management objectives can nonetheless be achieved without providing upstream fish passage, as compensation habitat will be provided downstream. Final agreement with the MNR on this approach will be required during the permitting and approvals phase of development.

10.2. RESIDUAL SOCIOECONOMIC EFFECTS

Access

To ensure public safety during construction, public access to the construction areas will be controlled. The residual effect on access to the construction areas will be temporary and limited to the immediate project area, such that the impact will not be significant.

Should Option 2 of the access road be pursued, and the affected private landowners express concern regarding the potential for unauthorized vehicular traffic through their property, Xeneca will install fencing to prevent unauthorized use of the access road if requested by the landowners in question; this restriction would apply only to unauthorized vehicles, and will not affect existing snowmobile use of the area. This mitigation measure would minimize potential impacts to the remote character of the area, while avoiding negative impacts to the accessibility of existing snowmobile trails.

Navigation

The construction of a weir spanning the width of the Vermilion River at the project site will result in a residual effect to navigation across the Wabageshik Rapids. In order to ensure that both the upstream and downstream reaches of the river remain accessible, a portage trail will be constructed, allowing users of the river to bypass the facility. As outlined in Sections 3.5.2 and 4.2.10 above, a temporary portage trail will be provided during the construction phase of development, which will be replaced with a permanent portage trail at the end of construction activities. With the creation of the portage trail, the overall impact to the navigability of the Vermilion River at Wabageshik Rapids will be minimized.

Employment and Forestry

There exists a potential benefit to the local and regional population in that the construction of the Wabageshik Rapids GS may result in the hiring of local labour and sourcing of local construction material (i.e. aggregate).

Energy and Electricity Reliability, Security and Distribution

Xeneca's proposed hydroelectric generating facility on the Vermilion River will have an installed capacity of 3.4 MW and will be operated to meet the socio-economic objective of generating clean energy when it is required by the province. Consultation with Hydro One and adjustments to the regional distribution grid will be required for connection of the projects to the Provincial connection grid. The projects will also have black start capability, and will be able to contribute to reliable generation capacity.

11. CUMULATIVE EFFECTS

Cumulative effects can be defined as long term changes that may occur as a result of the combined effects of each successive action on the environment. Cumulative effects may result from interacting effects of multiple projects in a given area, or multiple activities acting on a single ecosystem component. The assessment of the potential cumulative effects posed by a project was a requirement under the previous *CEAA* (1992). Although the previous *CEAA* (1992) and the current *CEAA 2012* do not apply to the project, the proponent felt other planning process requirements may also be met by this discussion and therefore have included it herein. The assessment of cumulative effects examines past, present and "reasonably foreseeable" future activities in addition to the activities posed by the project, and considers how these would affect the valued ecosystem components within the project area, and beyond, if necessary.

The assessment of cumulative effects outlined below is based on a precautionary approach and the professional judgement of the EA team. As additional information about Wabageshik Rapids and other projects and activities in the area becomes available, the characterization and assessment of cumulative effects will be further discussed through the impact assessment, detailed design, and permitting stages of the project.

The potential cumulative effects of the proposed development are discussed in the following sections.

Other Water Control Structures and Generating Stations

As detailed in Section 2.2 (Existing Infrastructure), several other water control structures and generating stations are present along the Vermilion River, both upstream and downstream of the proposed Wabageshik Rapids project site. The Vale-owned Lorne Falls GS is located upstream, at the outlet of Ella Lake, whereas the Domtar-owned dam and generating station are located downstream on the Spanish River. Another Vale-owned dam, the Nairn Dam, is located on the Spanish River, approximately 15 km upstream of the confluence with the Vermilion River. One of the concerns cited during the EA planning process was the potential for cumulative effects on flows and water levels as a result of several water control structures regulating the Vermilion and Spanish Rivers.

When the Wabageshik Rapids GS is operating in run-of-river mode, flows and water levels in the Vermilion River (and by extension, the Spanish River downstream of its confluence with the Vermilion River) will the same as pre-project conditions, with the exception of the bypass reach and the headpond between the weir and the outlet of Wabagishik Lake. No cumulative effects on flows and levels in the river would occur during these times (i.e. during very low flow, high flow and during Walleye and Lake sturgeon spawning).

During modified run-of-river operations, the Wabageshik Rapids GS flows will not fluctuate in such a manner that would result in water levels at the Domtar dam exceeding its compliance range. This operating restraint is also meant to address potential impacts on the Domtar dam due to the presence of two modified run-of-river facilities upstream (Wabageshik Rapids GS on the Vermilion River and the Nairn Dam on the Spanish River): should water levels in the headpond of the Domtar dam approach the limits of its compliance range, the Wabageshik Rapids GS will revert its operations to run-of-river in order to halt its contribution (if any) to water level fluctuations in the Domtar dam's headpond. Additionally, all water released through the Wabageshik Rapids GS over the course of a 24-hour period will be equivalent to the amount that would have been passed over the same time period under pre-construction conditions. As a result of these operating constraints, cumulative impacts downstream of the Domtar dam are anticipated to be minimal. However, Wabageshik Rapids GS operation (combined with flows from the Nairn Dam) may result in pulses that could have a potential impact on hydroelectricity generation at the Domtar Dam because excess flows may result in an increased need for Domtar to spill water. Increases in flow variability at the Domtar Dam may increase manpower requirements for operations.

The minimal flow requirement at the Domtar Dam of 17 m^3/s is required to be maintained on a continuous basis for effluent dilution and this could be cumulatively impacted by the combined operations at the Wabageshik Rapids GS and at the Nairn Dam. Pulsing effects from the combined operations of the Wabageshik Rapids and Nairn Dam may cause cumulative impacts at the headpond of the Domtar Dam, with potential to alter the aquatic habitat in the Lower Spanish River, downstream of the dam.

As noted in Section 7.2.5, headpond water levels of the Wabageshik Rapids GS will be maintained such that they follow natural daily lake levels in Wabagishik Lake, and will therefore not impact operations and the tailwater level at the Lorne Falls GS upstream. Given that the Lorne Falls GS operates as a run-of-river facility, and the zone of influence of the Wabageshik Rapids GS will not overlap with that of the Lorne Falls GS, no cumulative impacts resulting from the operations of these two facilities are anticipated.

It should be noted that throughout much of the EA planning process for the proposed Wabageshik Rapids GS, Xeneca was proposing three other waterpower facilities on the Vermilion River. Whether or not these other proposals will be pursued is currently undecided; due to this uncertainty, the potential cumulative impacts of building all four waterpower facilities are not discussed here. Should Xeneca decide at a later time to resume one or more of these other proposals, it will be at that time that the cumulative impacts of these facilities along with the Wabageshik Rapids GS will be discussed.

Energy and Air Quality

Xeneca's proposed hydroelectric generating facility on the Vermilion River will have an installed capacity of 3.4 MW and will have a positive cumulative effect along with all other new generation facilities of the province. The idea of "every kilowatt counts" will be collectively met to contribute to the government's goal of generating clean energy for the province and reducing greenhouse gas emissions.

12. MONITORING & FOLLOW-UP PROGRAMS

Proposed monitoring and follow-up programs are presented below. Additional programs may emerge through on-going consultation within the regulatory approvals stages of the development planning.

12.1. CONSTRUCTION MONITORING

Prior to construction, the Construction Management Plan (CMP) presented in Annex II will be enhanced to incorporate any construction management strategies outlined in the ER and supporting annexes as well as any permit application or federal approval/authorization requirements. The final CMP will be submitted to the regulators as supporting documentation for construction permits and approvals.

The proponent will:

- Ensure that all necessary regulatory permits and approvals (federal and provincial) have been obtained prior to the start of any site preparation or construction activities.
- Ensure that all contractors are familiar with and are applying the identified mitigation measures outlined in the CMP and industry/regulator best management practices.
- Ensure that controls to minimize environmental effects during construction (e.g. sediment fencing) are regularly inspected and functional, and conduct inspections after any event which might disturb the control measure (e.g. a heavy rainfall event).
- Ensure that the mitigation measures being applied are not creating adverse environmental effects, and that mechanisms are in place for corrective and remedial action to address these if they occur.
- Ensure that all signage and required traffic control measures, including posted speed limits, remain in appropriate locations as construction proceeds and in good visual condition.
- Ensure that all site restoration activities have been implemented.

12.2. POST-CONSTRUCTION / OPERATION MONITORING

Xeneca has prepared a conceptual post-construction monitoring table detailing various aspects of monitoring that will be necessary following the completion of the facility. This table was prepared based on the suggestions of the project team and the monitoring requirements identified by regulators through the course of the EA. The post-construction monitoring table will be further developed into a comprehensive post-construction monitoring plan through project permitting and approvals following the completion of the EA as detailed design details become available.

Table 36: Post-Construction Monitoring Actions

Environmental Component		Monitoring Methodology	Monitoring Frequency and Timing	Trigger for Action	Reporting
Aquatic Biota and Habitat	Fish Communities	Fish community sampling will be conducted in August following the Riverine Index Netting (RIN) protocol with large RIN nets. A total of 15 nets will be set in the Vermilion River between Wabageshik Rapids and the confluence with the Spanish River, similar to the protocol followed during pre-construction baseline surveys. This sampling will provide specimens for analysis of fish tissue mercury concentration. (See Preliminary Biological Monitoring Plan in Annex III)	Fish community sampling will occur in years 3, 6 and 9 of facility operation.	Should the fish community monitoring results reveal substantial changes in the fish community that are of concern, Xeneca will discuss the matter with MNR. Appropriate mitigation strategies will be developed as appropriate in the context of the various aspects of resource use that affect the fish community in the Vermilion and Spanish Rivers. Possible mitigation strategies include reducing the ratio of maximum flow to minimum flow during specific months of the year, which can be achieved by increasing the minimum flow or decreasing the maximum flow. Another consideration would be whether changes to the fish community are caused by impacts on recruitment. In this case, modification to the compensation fish habitat may be an option. Fish stocking could also be a viable management option for a valued species such as Walleye.	The results will be submitted to MNR annually for each monitoring year.
	Benthic Invertebrates	Benthic invertebrate sampling will utilize artificial substrate sampling using Hester-Dendy artificial substrate samplers (H-D sampler). 10 samplers will be installed in Wabageshik Rapids and 5 will be installed within Graveyard Rapids. The benthic invertebrates will be identified to the lowest practical taxonomic level by a professional taxonomist. Basic habitat information such as wetted width, depth and hydraulic head will be collected at the location of the H-D samplers as well. (See Preliminary Biological Monitoring Plan in Annex III)	Sampling will occur once in years 1, 3, 6 and 9 of facility operation.	Should results reveal changes in the benthic community that are of concern, Xeneca will discuss appropriate mitigation strategies with MNR. Possible mitigation strategies include reducing the ratio of maximum flow to minimum flow during specific months of the year, which can be achieved by increasing the minimum flow or decreasing the maximum flow. A different approach would be to alter the riffle habitat to maintain a greater wetted area during minimum flow conditions.	The results will be submitted to MNR annually for each monitoring year.

Aquatic Biota and Habitat	Compensation Fish Habitat	Fish habitat will be constructed in the Vermilion River in the bay immediately downstream of Wabageshik Rapids, and within Graveyard Rapids. Water depths and water velocities will be measured on at least 2 occasions during the spawning season for Walleye and Lake sturgeon spawning. Spotlight and daytime visual surveys, egg mats and larval drift netting will be carried out to determine the presence of Walleye and Lake sturgeon within the new spawning habitat. Capture of adults will also be used as appropriate to confirm presence and inform the approach to the other sampling methods. (See Preliminary Biological Monitoring Plan in Annex III)	The first five years of facility operation.	If the compensation fish habitat is not functioning as intended, Xeneca will discuss appropriate mitigation strategies with DFO and MNR. There would be a variety of options to modify the habitat. For example, additional large boulders could be placed in order to provide more resting areas for spawning fish and/or to provide greater variety of water velocities. Similarly, additional large or small substrate material could be placed in order to change the substrate composition, initially in a portion of the spawning bed in order to test success.	The results will be submitted to MNR annually for each monitoring year.
	Fish Stranding	Fish stranding will be monitored within the 300 m section of Wabageshik Rapids downstream of the proposed GS where the potential for stranding exists. A camera will be installed and directed downstream of the proposed GS to observe any stranding of fish during incidental or emergency shutdown of flows. The areas downstream will be visually assessed for stranding of all fish species. Onsite staff will be trained in the identification of stranding and will be required to notify a biologist of any occurrences for further observation and reporting. (See Preliminary Biological Monitoring Plan in Annex III)	The first three years of facility operation.	Should fish stranding be identified as an issue, possible mitigation measures include minor habitat adjustments at problem areas to provide a pathway for stranded fish to reach the flowing water. Another option would be to adjust the operations such that flow is reduced at a slower rate to provide more time for fish to escape areas being dewatered.	All occurrences of fish stranding will be reported to MNR annually for each monitoring year, and any unusual events (twice the numbers than previously observed) will be reported to the Sudbury District MNR within 1 week.
	Fish Entrainment and impingement	Fish mortality from entrainment and impingement will be monitored to determine whether entrance velocity and trash rack spacing is adequate to mitigate fish mortality from entrainment and impingement.	Should occur in first year following construction when turbine is operating at maximum capacity	Should intake velocities be outside of predicted ranges to protect fish from entrainment and mortality or should entrainment or impingement be detected modifications to the intake can be made to prevent entrainment and impingement including lighting, electrical barriers, air bubbling and sound barriers	The results will be submitted to MNR and DFO within 3 months of each survey being done

Aquatic Biota and Habitat	Fish Tissue Mercury Concentrations	Fish captured for fish community survey using RIN protocol will be used for fish tissue mercury analysis. Large fish: total mercury – 10 samples; methyl mercury – 5 samples, of at least 25 to 55 cm length; Forage fish: total mercury and methyl mercury – 5 composite samples, of 5 to 10 individuals of yearling perch or other cyprinid species. Fish will be sampled from the same location as baseline sampled-downstream of Wabageshik Rapids. (See Section 4.3 of the Pre-development Water Quality and Fish Tissue Mercury report, in Annex IV of this ER)	Sampling will be conducted in years 1, 2, 3, 6 and 9 of facility operation (forage fish) and 3, 6 and 9 (large fish) to assess mercury accumulation in fish tissue.	Fish tissue mercury is anticipated to increase for a number of years post-development. The monitored results will be provided to the MOE mercury consumption advising program. If the mercury level is not attenuated to background levels after 9 years, the monitoring program will be extended.	The monitoring results will be compared to baseline results and reported to MOE.
Terrestrial Vegetation and Wildlife	Vegetation and Significant Wildlife Habitat	Four Mineral Shallow Marsh wetland communities occur at the outlets of tributary streams within the downstream extent of the proposed Wabageshik Rapids GS. Monitoring of vegetation and wildlife within Candidate SWH will include vegetation monitoring, and surveys of amphibians, waterfowl and marsh birds during the breeding season, as well as turtle nesting activity. Vegetation surveys will be conducted during the spring (June). These surveys will be helpful in assessing if any indicator species continue to use Candidate SWH after the construction of the Wabageshik Rapids GS. (See Preliminary Biological Monitoring Plan in Annex III)	Monitoring will occur to collect 1 year of baseline information prior to construction, and during years 1, 3 and 6 of facility operation.	Should surveys identify that wetland communities are being adversely impacted; Xeneca will discuss the matter with MNR and develop appropriate mitigation strategies. Possible strategies include reducing the maximum daytime flow for some or all of the months of June through October, and further constraining the daily water level fluctuations during the growing season. Monitoring will continue after mitigations are put into place to ensure that the strategies employed have the desired effect.	The results will be submitted to MNR annually for each monitoring year.

Terrestrial Vegetation and Wildlife	Turtle Overwintering Habitat	Blanding's turtle was identified as a Species at Risk (SAR) that are known from the vicinity of the Wabageshik Rapids GS project area. Monitoring of turtle overwintering habitat within the wetlands will include habitat assessment during the overwintering season from late fall to early spring and study of turtles emerging in the spring in late April. The habitat variables to be measured include water temperatures, dissolved oxygen levels, water depth and depth of ice. The number of sampling locations will be specified according to the size of the habitats being used by overwintering turtles. (See Preliminary Biological Monitoring Plan in Annex III)	The monitoring will occur to collect 1 year of baseline information prior to construction, and in years 1, 3 and 6 of facility operation.	Should surveys identify that turtle overwintering habitats are being adversely impacted, Xeneca will discuss appropriate mitigation strategies with MNR. Possible strategies include increasing one or more of the minimum flow requirements for the months of January, February and March, and further constraining the daily water level fluctuations during the overwintering season. Monitoring will continue after any mitigations are put into place to ensure that the strategies employed have the desired effect.	The results will be submitted to MNR annually for each monitoring year.
	Deer Crossing	Deer crossings have been observed downstream of the facility under various flow conditions during early winter and early spring periods. Monitoring of deer crossing will include deer camera surveys located at both the downstream and upstream crossing locations in late-March to mid-April, and early-December to Mid-January to discern if movements are impacted due to the operation. (See Preliminary Biological Monitoring Plan in Annex III)	Monitoring will occur to collect 1 year of baseline information prior to construction, and during the first three years of facility operation.	Should surveys identify that deer crossing is being adversely impacted, Xeneca will discuss appropriate mitigation strategies with the Sudbury District MNR. The turbine outflow may be adjusted. Possible strategies include reduction of the maximum daytime flow during seasonal peaks in crossings, and adjustment of the daily timing of increased daytime flows. Monitoring should continue after mitigations are put into place to ensure that the strategies employed have the desired effect.	The results will be submitted to MNR annually for each monitoring year.
Facility Operation	Water Levels	The headpond water level will be monitored from a water level logger located on the upstream side of the powerhouse. Instantaneous flows at this location will be monitored at 15-minute intervals. (See Section 5.8, "Compliance Considerations")	At 15-minute intervals for the duration of facility operations.	An operating system will be designed to include an alarm to notify the operator when water level deviates outside the target operating range. The facility inflow and outflow will be adjusted until the level returns to the target operating range. An Incident Report following standard compliance procedures outlined by MNR will be submitted.	The monitoring information will be submitted to MNR annually for each monitoring year.

Facility Operation	Water levels	A second water level logger will be established at the outlet of Wabagishik Lake to verify the natural lake level and outflow from Wabagishik Lake. Wabagishik Lake level fluctuation will not exceed ± 5 cm in any given day due to the Wabageshik Rapids GS operations. (See the proposed Operating Plan in Annex I of this ER)	At 15-minute intervals for the duration of facility operations.	An operating system will be designed to include an alarm to notify the operator when the lake level deviates outside the target operating range. The facility inflow and outflow will be adjusted until the level returns to the target operating range. An Incident Report following standard compliance procedures outlined by MNR will be submitted.	The monitoring information will be submitted to MNR annually for each monitoring year.
		Downstream water levels will be monitored from a water level gauge within a pool area located 400 m downstream of the spillway. Daily water level fluctuations due to operations will not exceed ± 15 cm of the daily average in the pool. (See the proposed Operating Plan in Annex I of this ER)	At 15-minute intervals for the duration of facility operations.	Should the water levels fluctuation deviate outside the target operating range, daily range of minimum and maximum flow will be adjusted until the level variability downstream does not exceed the required range. An Incident Report following standard compliance procedures outlined by MNR will be submitted.	
		Daily water level fluctuations at the headpond of the Domtar dam will be monitored, to ensure that operations at the Wabageshik Rapids GS are not resulting in the headpond water levels deviating outside of Domtar's operating band. (See the proposed Operating Plan in Annex I of this ER)	At 15-minute intervals for the duration of facility operations.	Should water level fluctuations at the Domtar headpond deviate outside its target operating band, the Wabageshik Rapids GS will go into run-of-river mode until Domtar is again within the required operating band. An Incident Report following standard compliance procedures outlined by MNR will be submitted.	
	Flow Rates	Total instantaneous discharge readings will be a combination of gauged/measured flows through the facility and calculated discharge from the spillway. (See Section 5.8, "Compliance Considerations")	At 15-minute intervals for the duration of facility operations.	An operating system will be designed to include an alarm to notify the operator when flow rate deviates outside the target operating range. The facility inflow and outflow will be adjusted until the flow rate returns to the target operating range. An Incident Report following standard compliance procedures outlined by MNR will be submitted.	The monitoring information will be submitted to MNR annually for each monitoring year.

Surface Water Quality	Water quality	Samples will be collected from upstream of the impoundment, within the impoundment, and in the deep pool immediately downstream of the proposed facility. The following parameters will be measured: - pH, conductivity, alkalinity; - Total Suspended Solids (TSS) and Total Dissolved Solids (TDS); - cations (Mg, Na, Ca, K); - anions (Cl, SO_4); - Dissolved Organic Carbon (DOC); - total phosphorus; - nitrate, nitrite, ammonia and total Kjeldahl nitrogen (TKN); - Total metals; - low level total mercury (0.1 ng/L detection limit); and - low level methyl mercury (0.02 ng/L detection limit). Water temperature, dissolved oxygen, pH, conductivity and turbidity will be measured in the field using YSI model 650 TDS multi-meter. (See Section 4.2 of the Pre-development Water Quality and Fish Tissue Mercury report, in Annex IV of this ER)	Samples will be collected three times a year during the spring freshet, the summer low-flow period and the fall mid-flow periods in years 1, 2 and 3 of facility operation.	Should monitoring identify that water quality is impacted, Xeneca will discuss the matter with MOE to determine if additional sampling or investigation into the source of the changes is necessary and develop appropriate mitigation strategies.	The monitoring results will be compared to pre-construction condition and reported to MOE annually for each monitoring year.
	Deep pool immediately downstream	Dissolved oxygen and water temperature are also being monitored with HOBO Dissolved Oxygen Loggers (U26-001) in the deep pool immediately downstream of the proposed facility. This monitoring will help to maintain the water quality and to evaluate potential changes in Walleye spawning habitat in the deep pool downstream of the proposed facility. (See Section 4.2 of the Baseline Water Quality and Fish Tissue Mercury report, in Annex IV of this ER)	The first three years of facility operation.	Should monitoring identify dissolved oxygen in the deep pool is decreased significantly, an adaptive management process for increased compensatory flows of up to 2 m^3/s will be implemented.	The monitoring information will be compared to pre-construction condition and reported to MOE annually for each monitoring year.

Erosion and Sedimentation Control	A monitoring program will be designed to validate channel dynamics, provide long-term insight into channel processes, and allow for the evaluation of channel performance and to quantify channel migration. One monitoring station will be established in the headpond and two monitoring stations will be established downstream of the project. Monitoring stations will be photographed and inspected annually and assessed for change.	The monitoring stations will be installed and re-established in years 1, 3, 5, 7 and 10 of operation.	Should the monitoring program identify that significant erosion or sedimentation is occurring, a detailed study will be carried out to determine the cause. If it is due to facility operation, an adaptive management plan will be developed with agencies to modify operations or provide physical shoreline protection measures.	The results of the post-development monitoring will be compared to pre-construction conditions and reported to Ontario MOE/MNR annually for each monitoring year.

13. REGULATORY APPROVALS AND PERMITS

Following the successful completion of the EA and the completion of detailed engineering design, the proponent will make application to various federal, provincial and municipal agencies for regulatory permits, approvals and authorizations. These permits, approvals and authorizations are required before site preparation or construction, or prior to the commissioning of the facility. A list of the regulatory permits that may be required for this undertaking is presented below in Table 37.

Table 37: List of Potential Regulatory Approvals

Permit and Legislative Requirement	Agency
Federal	
Authorization for Works and Undertakings Affecting Fish Habitat - *Fisheries Act* [Section 35(2)]	Fisheries and Oceans Canada
Authorization for Destruction of Fish by Means other than Fishing - *Fisheries Act* (Section 32)	Fisheries and Oceans Canada
Requires fish guards or screens to prevent entrainment of fish at any water diversion or intake – *Fisheries Act* (Section 30)	Fisheries and Oceans Canada
Requirement to provide for the safe passage of fish around an obstruction – *Fisheries Act* (Section 20)	Fisheries and Oceans Canada
Requires sufficient flow of water for the safety of fish and flooding of spawning grounds as well as free passage of fish during construction – *Fisheries Act* (Section 22)	Fisheries and Oceans Canada
Species at Risk Act (SARA) – authorizations, as applicable	Fisheries and Oceans Canada; Environment Canada
Approval for Construction in Navigable Waters – *Navigable Waters Protection Act* (Section 5)	Transport Canada (Marine)
Explosives Act - Temporary Magazine Licence	Natural Resource Canada (NRCan)
Provincial	
Lakes and Rivers Improvement Act (LRIA) – Section 14 – Location Approval and Plans and Specifications Approval	Ministry of Natural Resources
Lakes and Rivers Improvement Act (LRIA) – Section 23.1 - Water Management Planning	Ministry of Natural Resources
Public Lands Act (PLA) – Work Permits (Parts 1-5, as required).	Ministry of Natural Resources
Public Lands Act (PLA) – Land Use Permit or Licence to Construct	Ministry of Natural Resources

Public Lands Act (PLA) – Licence of Occupation	Ministry of Natural Resources
Public Lands Act (PLA) – Water Power Lease Agreement	Ministry of Natural Resources
Public Lands Act (PLA) – Grants of Easements (Policy PL 4.11.04)	Ministry of Natural Resources
Endangered Species Act (ESA) – permits and agreements, as applicable	Ministry of Natural Resources
Crown Forest and Sustainability Act (CFSA) - Forest Resource Licence and Overlapping Licence Agreement	Ministry of Natural Resources
Crown Forest and Sustainability Act (CFSA) – Use/maintenance agreement	Ministry of Natural Resources
Aggregate Resources Act (ARA) – Aggregate Permit	Ministry of Natural Resources
Permit to Take Water – *Ontario Water Resources Act* (Section 34), Category 2 (construction) and 3 (operation) [A]	Ministry of the Environment
Environmental Compliance Approval (ECA) (*Environmental Protection Act* - Industrial Sewage, Section 53; Air and Noise, Section 9; Waste Generator Registration, Section 18(1), Ontario Regulation 347)	Ministry of the Environment
Notice of Project and Registration of Contractors – Construction Regulation 213/91	Ministry of Labour
Ontario Energy Board Act (OEBA) - Electricity Generation Licence Potentially leave to construct (section 92) and Wholesaler license if transmission connected. Note would also require market authorization from the IESO if transmission connected.	Ontario Energy Board
Municipal	
Road Use Agreement	Municipality
Building Permit	Municipality

[A] As outlined by the MOE on March 21, 2013, the minimum flow proposal must include the specific parameters that would trigger the shift in operations from intermittent to run-of-river; an agreement with Domtar will also be required as part of the application for a Permit to Take Water for facility operation.

14. COMMITMENTS

The following commitments are made by the proponent, Xeneca Power Development Inc. in order to ensure the development of a sustainable waterpower project;

General

- The proponent is committed to ensuring compliance with the ER as a contract with the people of Ontario.
- The proponent will adhere to the OWA's Best Management Practices guidelines throughout the planning and execution of the project.
- The proponent is committed to the adoption and application of the mitigation measures outlined within this document for both the construction and operation of the proposed undertaking according to applicable legislation (i.e. adherence to Construction Management Plan and best management practices, such as applicable DFO Ontario Operational Statements as listed at http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/provinces-territories-territoires/on/index-eng.htm). This may be achieved through the hiring of an environmental monitor for the duration of the construction program and through operator training on environmental issues within the operational phase of the project.
- The proponent will apply the mitigation measures for erosion and sedimentation presented in the Preliminary Erosion and Sediment Control Plan (see Annex II). Such mitigation measures include phasing construction to minimize the duration of soil exposure, maximizing the retention of existing vegetation cover, installing silt fences around stockpiles of erodible material, and monitoring the effectiveness of the mitigation measures throughout the construction period. The proponent will develop a detailed Erosion and Sediment Control Plan before the start of the construction phase for the proposed undertaking.
- Furthermore, to mitigate the risk of erosion to the river bed immediately downstream of the spillway, the latter will be designed such that the final exit velocities and energy levels are consistent with existing conditions, and an optimal amount of energy dissipation can be achieved. This refinement of the spillway design will occur during the development of the detailed engineering design, following the completion of the EA.
- The proponent is committed to developing appropriate compensation for any significant adverse impacts in cooperation with the Agencies once the engineering details for the project have been advanced during the permitting phase of the project.
- Compensatory habitat will be created downstream of the facility on the Vermilion or Spanish Rivers to mitigate for loss of habitat.

- The proponent confirms that the proposed undertaking will have no adverse effects on the snowmobile bridge upstream of the project site. During the detailed design phase, design engineers will create a quantifiable inspection chart for the Operations Manager to review on an annual basis. Should the bridge become damaged as a result of construction activities or operation of the facility, the proponent commits to repairing the bridge. If engineering re-certification of the bridge is ever required, the proponent will collaborate with the snowmobiling community to ensure that it is completed in a timely and cost-effective manner.

Facility Construction

- Clearing activities for the inundation area will be conducted outside of the bat roosting season (mid-May to mid-July) to reduce impacts to any roosting bat species within the area to be cleared of vegetation.
- The proponent agrees to provide alternate access along the snowmobile trail should access be interrupted during the construction of the interconnection power line.
- In order to provide recreational users of the Vermilion River with the means to bypass the construction site, a temporary portage trail will be constructed. At the end of construction activities, a permanent portage trail will be established, which will follow a more direct and less steep route.
- During project construction, Xeneca will implement the avoidance plan proposed in their May 17, 2013 letter to the MTCS, in order to ensure that the pre-contact archaeological site ("Belmer site") is not impacted.

Facility Operation

- The operational restrictions outlined in Appendix 2 of the proposed Operating Plan (Annex I of this ER) will be implemented in order to mitigate potential impacts to Walleye and Lake sturgeon spawning.
- In addition to the proposed operating constraints for avoiding impacts to the tailrace and electricity output at Vale's Lorne Falls GS, Xeneca commits to sharing real-time flow data with Vale.
- The proponent commits to avoid negatively impacting operations at the Domtar dam (downstream of the Wabageshik Rapids GS). This includes commitments to:
    - Not holding back water under low flow conditions;
    - Constrain operations at the Wabageshik Rapids GS to ensure flow releases do not exceed the Domtar dam's ability to process the water through its turbines;
    - Constrain operations at the Wabageshik Rapids GS to ensure that it does not result in daily water level fluctuations exceeding the operating band of the Domtar dam's headpond;

  - Provide real-time flow data from the Vermilion River to Domtar;
  - Work collaboratively with Domtar to help them optimize their waterpower operations;
- Indemnify Domtar from costs incurred from any negative effects resulting from operations at the Wabageshik Rapids GS. If for any reason a final MOU between Xeneca and Domtar cannot be achieved before the permitting and approvals phase of development, Xeneca will operate such that an environmental flow of at least 6.5 m^3/s will be released from the Wabageshik Rapids GS at all times, which will provide the minimum flows required to maintain the agreed-upon effluent dilution levels at the Domtar dam.
- The operation of the facility will be aligned with the Spanish/Vermilion Rivers Water Management Plan as directed by the MNR (plan is presently in draft review). The final, approved Operating Plan will become part of the WMP through a *Lakes and River Improvement Act*, Section 23.1, Water Management Plan amendment once approval of the amendment is granted by the Minister of Natural Resources. Xeneca will participate in the water management planning process.
- The operating parameters of the proposed undertaking will ensure that ecological flow requirements are met, take into consideration any downstream navigation constraints, and avoid significant negative impact on public safety and civil structures.
- The Wabageshik Rapids GS will be operated in such a manner that peaking cycles occur no more than once per 24-hour period, such that the volume of water released over this time period will remain approximately equal to pre-development conditions.
- Upstream operational effects will be mitigated through the compliance commitment to maintain water levels within ± 5 cm of daily average lake levels in Wabagishik Lake.
- Should the government direct Xeneca to maintain water levels in Wabagishik Lake at a specific level, the facility will be operated in this manner to the extent possible, provided that doing so does not conflict with the objectives described in the proposed Operating Plan for maintaining headpond water levels.
- Downstream operational effects will be mitigated through the compliance commitment to maintain water levels in the bay (located approximately 400 m downstream of Wabageshik Rapids) to within ± 15 cm of daily average levels.
- Downstream operational effects to specific aquatic habitat and species as a result of operations will be avoided by passing run-of-river flows during the spawning period and restricted flows during egg incubation and dispersal/drift.
- Dissolved oxygen concentrations within the pool immediately downstream of the spillway will be monitored both before and after project construction. Should monitoring reveal that dissolved oxygen concentrations are being negatively impacted, the compensatory flow will be increased from 0.5 m^3/s to 2.0 m^3/s to ensure proper flow circulation.

Consultation

- The proponent is committed to realizing signed Memorandums of Understanding with individual First Nations.
- The proponent is committed to continuing to engage specific stakeholders on relevant issues after the issuance of the Notice of Completion and Statement of Completion.
- Xeneca will maintain or enhance existing vegetative buffers between the river, roads, and any ancillary works to preserve the aesthetic quality of the area; Xeneca will construct portages as directed by Transport Canada under the *Navigable Waters Protections Act*, and is also willing to facilitate access by improving any existing public boat launches and parking areas.
- Should private landowners express concern that the construction of the access road would result in unwanted traffic and trespassing through their properties, and if requested by the landowners in question, Xeneca will install gates to limit road access across private properties to the landowners only.
- Xeneca will submit a request to the mining claim holder for an agreement for signature that will acknowledge the project and the terms under which Xeneca will develop the site.
- It is understood that prior to obtaining Location Approval under the *LRIA*, written consent and/or a MOU with both Domtar and Vale is required, demonstrating that their concerns are addressed and that proper measures will be implemented to ensure that they will not be impacted by the proposed Wabageshik Rapids GS. As these formal agreements are not required for the EA planning process, discussions with these parties will continue after the issuance of the Notice of Completion for the Wabageshik Rapids GS project.

Further Investigations

- Xeneca has committed to undertaking post-construction monitoring as outlined in Section 12 above.
- The proponent will update the Construction Management Plan based on advanced project design to include instructions and protocols for minimizing the disturbance to valued ecosystem components.
- To confirm whether water quality is being impacted by the project, the proponent has committed to a pre- and post-development monitoring program for the proposed Wabageshik Rapids GS that includes a surface water quality and fish tissue sampling program.
- Prior to construction, a drilling and testing program of the rock material will be completed to confirm if rock mineralization and the potential for ARD exist at the project

site. Rock sampling and analysis for ARD will be completed by a qualified professional (P.Geo. or P.Eng.) in accordance with the methods and procedures from Mine Environmental Neutral Drainage guidelines.

- Should the potential for ARD be confirmed, a management plan will be prepared and submitted to regulatory agencies for review prior to the start of any excavation works.

15. CONCLUSIONS

Xeneca Power Development Inc. (Xeneca) proposes to construct and operate the Wabageshik Rapids hydroelectric power generating station (GS) on the Vermilion River. This document describes the environmental assessment (EA) carried out as part of the planning process for the proposed project.

Throughout the environmental planning process, Xeneca has endeavoured to understand the environment in which the project would be built by undertaking an extensive information and data collection program. Data on areas of the environmental setting of the project was collected by discipline experts including:

- Stage 1 and 2 archaeological assessments;
- A natural environment characterization and impact assessment;
- Erosion study (high level) and fluvial geomorphic assessment on the riverine system in the zone of influence;
- Database analysis and mapping exercise and wetland assessment and flyover to route the connection line and access roads;
- A statistical analysis of historical hydrological data;
- Hydraulic model study analyses;
- Conceptual engineering design; and
- Baseline surface water quality program.

A comprehensive agency and public consultation program also contributed key information towards the identification of the potential adverse and positive environmental effects of the project. Once the proponent has met the requirements of the Waterpower Class EA, resolved any outstanding issues that were raised during the formal review period and satisfactorily addressed any Part II Order requirements, a Statement of Completion may be filed. The project may then proceed to the permitting and approvals phase of development.

Aboriginal and First Nation engagement was undertaken with each community's leadership as part of the business to business Aboriginal consultation initiative by the proponent. A comprehensive engagement initiative with each community located within, or having traditionally used the project area has been underway since the issuance of the Notice of Commencement and will continue beyond Notice of Completion and into project implementation.

The Stage 2 archaeological assessment of the project identified the Belmer site. It was determined through discussion with Xeneca hydrologists that Xeneca could avoid any impacts to the Belmer site during project development and operation. In January of 2013, the Ministry of Tourism,

Culture and Sport accepted the Stage 2 investigation report and indicated that Stage 3 work not needed if the proposed project will create no impact to the site. It was recommended by Woodland Heritage Services that Xeneca take all reasonable measures to avoid the site, and Woodland Heritage Services committed to working with Xeneca to ensure future protection of the site. Aboriginal consultation required under the Stage 3 provincial standards has been initiated.

Throughout this document, management strategies have been developed and applied to known impacts in order to avoid, prevent or minimize any identified adverse environmental effects of the project. It is the conclusion of this environmental assessment that, in the absence of any compensation activities, significant adverse effects may occur to aquatic habitat and fish passage. Loss or alteration of aquatic habitat is anticipated to occur in the proposed inundation area, the project footprint, and in a portion of the Vermilion River downstream of the Wabageshik Rapids GS. Therefore, to offset this loss, compensation habitat will be created downstream of the facility and will be monitored for the first five years of operation to verify whether the newly-created habitat is functioning as intended. Additionally, it is Xeneca's belief that the MNR's fisheries management objectives can be achieved without providing upstream passage for Walleye and Lake sturgeon, as required habitat for these species are available and can be enhanced downstream of the facility. Final agreement with the MNR on this approach will be required during the permitting and approvals process.

The location and nature of the proposed compensation habitat for these anticipated impacts will be further developed and discussed with DFO and the MNR once the engineering details for the project have been advanced during the permitting phase of the project.

There are also many positive environmental effects associated with the project which are considered to off-set the adverse environmental effects associated with the project. These include:

- Tangible Economic Outcomes for the Local Communities and the Regional / Provincial Economy:
    - Benefit to the local SFL holder (Domtar Inc.-EACOM (Pineland Forest Management Unit)) by sale/processing of merchantable timber along the connection line and access road ROWs, and the merchantable timber to be harvested from the area of inundation.
    - Job creation during construction both directly and indirectly in the near North Region of Ontario. Direct employment (construction only) for waterpower projects is estimated at 10,000 person hours per MW; indirect jobs multiply by 1.5; and up to two (2) part time jobs will be available in the operation and maintenance of the facility.

  - An increase in economic activity (direct and indirect) to build the project procuring everything from consulting and legal services to concrete, steel, trucking and other services such as lodging, food and fuel. The majority of this activity will be created within the local/regional economy.
- Employment and training opportunities (planning, construction and operation phases of the project);
- Creation of reliable and secure green energy for the province and reduced Greenhouse Gas emissions:
  - The project will reduce CO_2 emissions by eliminating the need for an equivalent amount of electricity to be produced through the combustion of fossil fuels.
  - Benefits to the population, commerce and industries of Ontario by providing more reliable and consistent renewable power to the provincial grid for many years to come. Many power plants built in the early 1900s are still in operation and with regular maintenance and upgrades can last for generations to come.
  - The operation of the facility in the existing power grid will be compatible with the overall power system reliability and power quality (voltage and frequency) objectives while improving distribution customer service reliability in this area, from a sustainable and consistent power source.
- The generation of electricity through a renewable energy supply in support of the province's *Green Energy Act*.

Preliminary planning discussions towards the development of various management strategies are outlined in this document, and the proponent will continue to work with the regulators and other interested parties in support of securing approvals for this undertaking. The application of the recommended management strategies and adherence to the identified commitments by the proponent will help to realize a sustainable renewable energy development project.

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