

Henvey Inlet Wind LP

Henvey Inlet Wind

Volume A: Henvey Inlet Wind Energy Centre Environmental Assessment – Interim Draft

draft for discussion

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List of Acronyms and Glossary

ACSR	. Aluminum Conductor Steel Reinforced
AQI	. Air Quality Index
CEAA	. Canadian Environmental Assessment Act
COSEWIC	. Committee on the Status of Endangered Wildlife in Canada
CSA	. Canadian Standards Association
CWS	. Canadian Wildlife Service
DFO	. Fisheries and Oceans Canada
DND	. Department of National Defence
EA	. Environmental Assessment
EC	. Environment Canada
ESA	. Endangered Species Act
FIT	. Feed-in-Tariff
ha	. hectare
HIFN	. Henvey Inlet First Nation
HIW	. Henvey Inlet Wind
HIWEC	. Henvey Inlet Wind Energy Centre
HONI	. Hydro One Network Inc.
IESO	Independent Electricity System Operator
IWH	. Important Wildlife Habitat
km	. Kilometres
kV	. Kilovolt
m	. Metre
mm	. Millimetres
mASL	. Metres Above Sea Level
MBCA	. Migratory Birds Convention Act
MNDM	. Ontario Ministry of Northern Development and Mines
MNRF	Ontario Ministry of Natural Resources and Forestry
MOECC	Ontario Ministry of the Environment and Climate Change
MTO	. Ontario Ministry of Transportation
MW	Megawatt
NAV CANADA	Navigation Canada
NHIC	Natural Heritage Information Centre
Nigig	Nigig Power Corporation
0&M	operations and maintenance
OEB	Ontario Energy Board
OPA	. Ontario Power Authority
OPGW	. Optical Ground Wire
RABC	Radio Advisory Board of Canada
RCMP	. Royal Canadian Mounted Police
ROW	. right-of-way
SAR	. Species at Risk
SARA	. Species at Risk Act
SCADA	. Supervisory Control and Data Acquisition
SOCC	. Species of Conservation Concern
TS	. Transformer Station
WTG	. Wind Turbine Generator

1 Introduction and Overview

Nigig Power Corporation (Nigig) received a Feed-in-Tariff (FIT) Contract from the Ontario Power Authority (OPA) in 2011 for a 300 megawatt (MW) wind energy generation centre. Henvey Inlet Wind LP (HIW), a limited partnership between Pattern Renewable Holdings Canada ULC and Nigig Power Corporation, is proposing to develop the Henvey Inlet Wind Energy Centre (HIWEC), a 300 MW facility on Henvey Inlet First Nation Reserve No. 2 (HIFN I.R. #2). AECOM Canada Ltd. (AECOM) was retained by HIW to prepare an Environmental Assessment (EA) for the proposed HIWEC. The EA is being conducted in accordance with the Henvey Inlet First Nation Environmental Assessment Guidance Instrument (HIFN EA Guidance) requirements.

The purpose of this Interim Report is to present the draft findings of the EA baseline studies and provide an opportunity for the Henvey Inlet First Nation (HIFN) community and public to comment on the findings to date. The information presented in this report will be updated following the completion of 2015 field studies and the second round of community and public consultation planned for the summer of 2015. This report will ultimately represent the first four chapters of the Final Draft EA Report with the remaining chapters, including the assessment of environmental effects, included in the Final Draft EA Report. Appendices to support the EA are under development, and will also be included in the Final Draft EA Report.

1.1 Overview

HIFN I.R. #2 is a parcel of federal Crown land on the shore of Georgian Bay at Key River (approximately 80 kilometres (km) north of Parry Sound, Ontario) held by the Crown subject to the Aboriginal title of and for the benefit of HIFN. A small residential area comprised of HIFN Band Members is located immediately west of Highway 69 on Bekanon Road. Private, largely seasonal, cottage lot leases are located on the north side of Henvey Inlet and several HIFN Band Members have cabins within the HIWEC study area described in **Section 2.1**. Several HIFN Band Members utilize recreational lots within the HIWEC study area. The remainder of the study area is undeveloped and unpopulated.

HIFN I.R. #2 has been in active use by HIFN since pre-contact for habitation, hunting, fishing, gathering, burial, traditional use and cultural gatherings. In recent times, HIFN has used these lands for hunting, fishing, gathering, traditional use and cultural gatherings, forestry, aggregate extraction, waste management, and recreation. There have also been various proposals for commercial and economic development. HIFN requires that any future development be located to protect areas of cultural importance. The proposed HIWEC will have precedence over general uses of these lands, but otherwise these uses may continue. Overall the HIWEC footprint will be between 200-280 hectares (ha) within the approximately 9,233 ha that constitute HIFN I.R. #2.

The HIWEC will use wind to generate energy through the use of commercial wind turbine generator (WTG) technology. Approximately 100 to 120 WTGs are being assessed for the HIWEC with only 90 to 100 WTGs to be constructed. The HIWEC will also include pad-mounted transformers, crane pads, 34.5 kilovolts (kV) overhead and / or underground electrical collector cables, communication lines, meteorological towers, access roads, an operations and maintenance (O&M) building, an on-Reserve transmission line (up to 500 kV) within the study area, two 34.5 – up to 500 kV transformer stations (TSs), construction compounds and storage yards. It will include other ancillary facilities as required, such as a concrete batch plant(s), crusher(s), and parking areas.

HIFN has broad authority to manage and protect its Reserve lands. This authority comes from the *First Nations Land Management Act* (FNLMA), related instruments, and the HIFN Land Code. This authority includes responsibility for environmental protection and the environmental assessment of projects and physical activities on Reserve lands.

Off-Reserve there will be a new transmission line to deliver the electricity generated by the HIWEC to the Ontario electricity grid. Two potential routes are currently being considered. One route (Route A) extends east from the HIWEC study area and connects to the existing 500 kV Hydro One Networks Inc. (HONI) transmission line. Route A is approximately 20 km in length. The second route (Route B) generally follows Highway 69 and the existing 500 kV HONI corridor south to connect to HONI's 230 kV transmission line south of Parry Sound. Route B is approximately 90 km in length. Both routes will require a new TS or switchyard to connect to the HONI 500 kV line or 230 kV line. Route A is predominantly located on Crown-owned or managed lands and Route B is a combination of Crown-owned or managed lands and private ownership.

The off-Reserve transmission line is not within the regulatory authority of HIFN powers and responsibilities set out in the FNLMA or the Land Code. The off-Reserve transmission line is undergoing an EA under Ontario Regulation 116/01. Nevertheless, HIFN seeks to ensure that this EA considers this off-Reserve electricity transmission and its effects so that HIFN may fully understand the implications of approving what is proposed on-Reserve. The off-Reserve transmission line is described in a separate document to be provided in **Volume B** of the Final Draft EA Report.

1.2 Purpose

The province of Ontario's Long Term Energy Plan (Government of Ontario, 2013), which is predated by the Integrated Power System Plan (Government of Ontario, 2008), establishes a goal of bringing 20,000 MW of renewable energy online by 2025. As part of the effort to achieve this goal, Nigig was awarded a FIT contract to develop a 300 MW wind energy generation centre on HIFN I.R. #2. It will be a large-scale renewable energy centre capable of providing substantial economic benefits to HIFN's local economy. It will also provide economic spin-off benefits accruing to communities outside of HIFN related to procurement, construction and operation. Renewable energy contributes to a reduced reliance on fossil fuel based power generation resulting in additional environmental benefits such as reduced greenhouse gas emissions.

1.3 Regulatory Framework

Multiple permits, licenses, and authorizations may be required to facilitate the development of the HIWEC. The ultimate applicability of all permits, licenses, and authorizations will be determined by and based upon the facility design. The following sections detail any potentially applicable regulatory approvals.

1.3.1 Henvey Inlet First Nation

Pursuant to the FNLMA, the Government of Canada and HIFN have entered into agreements regarding the management of HIFN's Reserve lands, namely the Framework Agreement on Management of First Nation Land and an Individual Agreement. In 2009, HIFN adopted a formal Land Code which was amended in 2012 to apply to HIFN I.R. #2. Pursuant to these instruments, HIFN's Band Council is the decision-making authority with respect to the creation and granting of interests in lands within HIFN I.R. #2. These instruments also provide HIFN Band Council with the legislative, regulatory, and executive authority to ensure environmental management of the Reserve. This authority includes responsibility for EAs, permitting, and environmental protection for projects on HIFN lands.

HIFN has developed principles that address its overall requirements for EA and environmental protection. The principles are documented in the HIFN Environmental Stewardship Regime (HIFN 2015). The HIWEC EA must be conducted in accordance with these principles, applicable HIFN laws, and approved HIFN EA Guidance. A key principle is that "the standards for avoidance and mitigation of adverse environmental effects applicable to the Energy Centre will be at least equivalent in effect to the federal and provincial standards applicable to similar wind energy generation facilities located in Ontario, not on Reserve lands." Thus, the main body of this EA document is structured similar to typical federal EA requirements while the appendices are structured similar to typical provincial requirements.

The EA must be acceptable to HIFN before HIFN decides whether to issue an environmental permit for the HIWEC. If HIFN decides to issue a permit approving the HIWEC, it will use the EA to assist in developing terms and conditions of approval that may be enforced through its environmental protection laws, powers and responsibilities.

1.3.2 Federal

Table 1-1 provides a list of potentially applicable permits and approvals with federal departments and agencies. Any applicable federal permits and approvals required for the HIWEC will be confirmed during the development process prior to construction. For any required federal permits, the issuing agency may be required to comply with the requirements under Section 67 of the *Canadian Environmental Assessment Act (CEAA)*, 2012.

Permit / Approval	Approval Authority	Details
Aeronautical Obstruction Clearance (Lighting scheme)	Transport Canada – Aviation Division	Required for WTG marking and lighting
Navigation Protection Act Application for Approval	Transport Canada – Marine Division	Required if crossing a navigable watercourse
Explosives In Transit Permit (<i>Explosives Act</i> , 2013)	Natural Resources Canada (NRCan) - Explosives Regulatory Division	Required to transport explosives
Temporary magazine license (section 7(1) of the <i>Explosives Act</i>)	NRCan - Explosives Regulatory Division	Required to acquire and store certain explosives and equipment over specified quantities
Permit or approvals under <i>Species at Risk Act</i>	Environment Canada (EC)	Required if the HIWEC will destroy or remove species at risk (SAR) or critical habitat for SAR
Permit to collect bird carcasses of species listed as endangered or threatened (<i>Species at Risk Act</i>)	EC	Required to collect carcasses of endangered or threatened bird species during bird mortality surveys
Permit under <i>Migratory Birds</i> <i>Convention Act</i> to collect bird carcasses	EC-Canadian Wildlife Service (CWS)	Required to collect carcasses of bird species protected by the <i>Migratory Birds Convention Act</i> during bird mortality surveys
Authorization for watercourse crossing (Fisheries Act subsection 35(2))	Fisheries and Oceans Canada (DFO)	Potentially required if a proposed work, undertaking or activity result in serious harm to fish.
Aviation Safety Land Use proposal	Navigation Canada (NAV CANADA)	Required for all land use proposals near airports and air navigation infrastructure
Mandatory Coordination Contacts	Radio Advisory Board of Canada (RABC)	 Recommended process to contact the following organizations for wind energy centres: Industry Canada General Radio Frequency Database Spectrum Direct Broadcasting Database Integrated Spectrum Observation Centre Department of National Defence (DND) DND Radiocommunication Systems Military Air Defence and ATC Radars Royal Canadian Mounted Police Wind Farm Coordinator Environment Canada Weather Radars NAV CANADA Land-use Clearance
Review of proposal by the RCMP Mobile Communications Services	Royal Canadian Mounted Police (RCMP)	Recommended review for potential signal disruptions from wind energy centres

 Table 1-1.
 Potentially Applicable Federal Permits and Approvals

1.3.3 Provincial

Because HIFN I.R. #2 is federal Crown land, the majority of provincial permits, licenses and authorizations do not apply to the HIWEC. However, there are some exceptions to this; for example, there are several requirements through the Independent Electricity System Operator (IESO) to be met for the HIWEC to connect to the provincial grid. **Table 1-2** provides a list of potentially applicable permits and approvals from provincial ministries and agencies. Any applicable provincial permits and approvals required for the HIWEC will be confirmed during the development process and in place prior to the related work element for construction or for operations, as applicable.

Permit / Approval	Approval Authority	Details
Notice of Proposal Prohibition, transmission or distribution by generators (Section 80 of the <i>Ontario Energy Board Act</i>).	Ontario Energy Board (OEB)	Notification to the OEB is required to construct a generation facility
Leave to Construct (Section 92 of the <i>Ontario Energy Board Act</i>)	OEB	Required for the development of a high-voltage transmission facility
License to Generate Electricity (Section 57 of the <i>Ontario Energy</i> <i>Board Act</i>)	OEB	Required to generate electricity or provide ancillary services for sale through the IESO – administered markets or directly to another person without a license
License to Transmit Electricity	OEB	Required for transmission of electrical power to interconnect with provincial grid
Facility Registration	Independent Electricity System Operator (IESO)	Registration for a physical generation facility that is connecting to the IESO-controlled grid, will participate in the IESO-administered markets or programs, or is required by a Connection Assessment to register with the IESO
Connection Application	HONI / IESO	The customer completes the System Impact Assessment / Customer Impact Assessment application for a generation facility and submits to both Hydro One and the IESO.
Connection and Cost Recovery Agreement	HONI	An agreement between HIW and HONI which includes the recovery of costs to grid operator of changes to allow connection, scope of work, costs, payment schedule etc.
Certificate of Inspection and authorization to connect	Electrical Safety Authority	Ensure work complies with Ontario Electrical Safety Code

Table 1-2. Potentially Applicable Provincial Permits and Approvals

1.3.4 Municipal

Because HIFN I.R. #2 is federal Crown land, municipal permits, licenses and authorizations do not apply.

2 Project Description

2.1 Location and Study Area

The HIWEC study area includes the entirety of HIFN I.R. #2. HIFN I.R. #2 is bounded on the north by the Key River, Georgian Bay to the west, Highway 69 to the east with some HIFN I.R. #2 property located on the east side of Highway 69. The southern boundary runs from Sandy Bay on the southwest corner in a north easterly direction to Highway 69 south of Bekanon Road. The geographic location is along the eastern shore of Georgian Bay, south of French River Provincial Park and directly north of North Georgian Bay Shoreline and Islands Conservation Reserve (**Figure 2-1**). Highway 69 is a major north-south highway connecting Highway 400 north of Parry Sound with the City of Greater Sudbury at Highway 17.

Generally, the HIWEC study area has shallow soils, with many rocky outcrops forming longitudinal ridges running on a northwest to southeast axis, and is divided roughly in half by the Henvey Inlet waterbody. Numerous wetland pockets are located between the ridges and across the study area, with upland regions supporting forested areas of poplar and jack pine. **Section 4** provides a more detailed description of the existing environmental conditions within the study area. The study area for the HIWEC also includes lands off-Reserve that are within the area that may experience increased noise levels from the HIWEC. All HIWEC components will be located within the HIWEC study area as shown in the preliminary site plan provided as **Figure 2-2**.

2.2 Components

2.2.1 Permanent Components

2.2.1.1 Wind Turbine Generators and Foundations

As shown on **Figure 2-2**, 100 to 120 commercial WTGs are being assessed for the HIWEC with only 90 to 100 WTGs to be constructed. The specific WTG technology is yet to be determined and will be detailed in the Final Draft EA Report. The nacelle on each WTG will be located at the top of the tower and will consist of a generator, gearbox, bearings, couplings, and auxiliary equipment. Typically, the nacelle cover is constructed from reinforced fiberglass and the blades are constructed from fiberglass along with epoxy resin. The WTG tower will be constructed from tubular steel or concrete with an approximate diameter of 5 m at the base. The tower contains an internal ladder for maintenance access.

The height of the WTG will be identified in the Final Draft EA Report; however, external lighting will be required on some of the WTGs and will be installed in accordance with the Transport Canada and NAV CANADA requirements.

Geotechnical assessments will be used to determine the most suitable foundation design for each WTG. Where site specific conditions permit, rock anchors may be used to bolt the WTGs to bedrock. Alternatively gravity spread concrete footings could be used. The foundation design will include conduits to connect to the collector system and a grounding grid consisting of copper or aluminum wire and ground rods.

The land area required for each WTG will be dependent upon the final locations of the WTGs relative to access roads, associated infrastructure, and adjacent environmental and terrain features.

2.2.1.2 Access Roads and Crane Pads

Access roads will be constructed to support construction, operations, and decommissioning activities and to provide access to WTGs and other HIWEC infrastructure. Access roads will be designed to minimize the effects on the





environment (e.g., maintaining local drainage patterns and minimizing width of disturbance). Access roads will range from 5 to 20 m wide, with additional travel clearance required to accommodate large cranes and equipment transport during construction and decommissioning. In some locations it is anticipated that rock will need to be blasted and some areas filled with crushed rock to reduce grades to allow vehicles to bring in required equipment, cranes and WTG components.

Access roads that intersect with Highway 69 will be designed in accordance with MTO standards. Applicable MTO permits will be obtained prior to construction.

Crane pads will be required to be constructed at each WTG. Typical crane pads are approximately 20 x 30 m in size. Final crane pad design will be determined based the specific requirements of the cranes used for the HIWEC. Crane pads will remain in place to support any crane activities during the operations and/or decommissioning phases of the HIWEC.

2.2.1.3 Meteorological Towers

Meteorological (Met) towers are required during the operations phase to validate the performance of the WTGs and provide meteorological data to the Independent Electrical System Operator (IESO) to support their wind forecasting activities and operation of the provincial electrical system. Met towers will be connected to the O&M building via fibre optic cables (either overhead and / or underground). Four Met towers will be utilized and their locations can be found in **Figure 2-2**. As needed, additional meteorological equipment will be used to meet IESO market requirements.

Given the rocky nature of the site, Met tower bases have and will generally be bolted to surface bedrock with guy wires and anchors for lateral support. All Met towers have and will be installed as per IESO requirements and the Canadian Standards Association (CSA) protocol for power performance measurements.

2.2.1.4 Pad-Mounted Transformers and Collector Lines

A pad-mounted transformer will be located at the base of each WTG to step-up the voltage of electricity generated to the collector system voltage (e.g., 690 V to 34.5 kV). Each pad-mounted transformer will be affixed to a precast or poured in place concrete pad. Power cables entering and exiting the pad-mounted transformer will be installed underground along with a grounding grid consisting of copper or aluminum wire and grounding rods.

From each pad-mounted transformer, above or below ground 34.5 kV collector lines will carry electricity from the WTGs to the HIWEC's TSs. Fibre optic communication lines will be installed along with the collector system.

The collector lines may include overhead or below ground sections dependent on site specific conditions, however it is anticipated that the collector system will be primarily above ground due to the rocky nature of the site. Aboveground collector lines will be constructed on standard single wooden pole structures. Collector lines will generally follow the access roads to reduce construction area and to minimize potential construction effects. Water crossings for the collector lines will likely be overhead and will be constructed according to the federal and provincial requirements.

2.2.1.5 Transformer Stations

Two TSs will be constructed on HIFN I.R. #2 to step up the 34.5 kV voltage of the collector lines to the 230 kV or 500 kV voltage of the transmission line that will transport electricity to the provincial transmission grid. One TS will be located on the north side and the other on the south side as shown in **Figure 2-2**.

The HIWEC TSs will consist primarily of power transformers, grounding transformers, 34.5 kV and up to 500 kV circuit breakers and disconnect switches, surge arrestors, instrument transformers, meters, a protection and control building, and ancillary equipment, along with associated concrete foundations to mount the equipment. The HIWEC TSs will be located on a graded area, roughly 50 m x 50 m, which will be confirmed during the detailed design phase. The HIWEC TSs will be fenced and secured to prevent unauthorized entry and maintain public safety. All non-current carrying and conducting metal components within the TS area will be connected to a grounding grid installed below finished grade.

2.2.1.6 On-Reserve Transmission Towers and Foundations

From the HIWEC TSs, a section of overhead transmission line of up to 500 kV will be constructed on HIFN I.R #2. The transmission line will consist of Aluminum Conductor Steel Reinforced (ACSR) cable. The conductors will be attached to insulators and tower structures that will be approximately 30 to 40 m in height. An Optical Ground Wire (OPGW) will be installed on the transmission line to facilitate communications between the HIWEC and the TSs.

The towers will be steel monopole and / or wood structures directly buried, erected on concrete foundations or bolted to bedrock as appropriate for the tower location. On average, the structures will be spaced approximately 200 to 400 m apart except where site specific conditions require shorter or longer tower spans (e.g., significant changes in line direction, large waterbody crossings, or in compliance with design codes and laws).

2.2.1.7 Operations and Maintenance Building

An O&M building will be constructed to monitor the day-to-day operations of the HIWEC and provide an area for storage of spare parts and maintenance equipment. The O&M building will require a concrete foundation and may include offices, staff parking, a workshop, parts and vehicle storage, a septic system, water well(s), a storage yard, and other ancillary facilities.

Fencing will surround the building for security purposes. Domestic water, if required, will be supplied from a water well. Wastewater will be delivered to a septic system or tank for removal off-site. A small amount of domestic solid waste (e.g., garbage, recycling, and organics) will be generated by workers during maintenance activities and will be collected and permanently disposed of at a licensed facility. Power to the O&M building will be supplied through the local distribution network with a back-up, liquid fuel-fired generator.

2.2.2 Temporary Components

During HIWEC construction, lands will be temporarily used for: construction compounds and laydown yards; construction areas surrounding infrastructure including parking areas (e.g., WTG staging areas); concrete batch plant(s); crusher(s) and water withdrawal points. Temporary cleared areas will be minimized as much as possible and will be limited to the minimum area required to safely and efficiently support associated construction activities. Following construction, temporary areas will be restored to a safe and clean condition.

2.2.2.1 Construction Compounds & Laydown Yards

Temporary construction compounds and laydown yards will be required to support general construction activities and for temporary storage of WTG components, electrical equipment (e.g., cable reels and pad-mounted transformers), construction materials, containers, vehicles, equipment, office trailers, concrete batch plant(s), crusher(s) and portable toilets. Typically, these areas are cleared and graded. Temporary storage of materials will conform to applicable codes, including any fuel storage which will have adequate secondary containment and bollards for impact protection. The location of the temporary construction compounds and laydown yards are shown in **Figure 2-2**.

2.2.2.2 Wind Turbine Generator Staging Areas

A staging area will be cleared around each WTG location to support assembly of the WTGs, provide space for construction equipment, and for storage of material excavated for foundation construction. Staging areas will be cleared and leveled (with gravel or blasted rock if required) on land adjacent to the base of the WTGs. Geotextile will be used to facilitate removal of gravel following construction activities if required. WTG components will either be delivered to the construction compounds for temporary storage or directly to the staging areas for assembly. If required, portable generator sets used for WTG pre-commissioning may also be located in these areas.

2.2.2.3 Concrete Batch Plant(s)

At least one temporary concrete batch plant will be located within a construction compound, and will produce concrete required for HIWEC construction. Site preparation for the plant will consist of clearing, grading and leveling activities. Concrete batching activities will occur in parallel with the relevant HIWEC construction activities (i.e., foundation installation).

Aggregate materials required for concrete will be obtained from local aggregate sources in the vicinity of HIFN I.R. #2.

2.2.2.4 Crusher(s)

One or more temporary crushers will be located within a construction compound, and will crush rock from blasting activities. Blasting will be needed to remove rock for access roads. The crushed rock will then be used to fill areas needed for access roads. Site preparation for the crusher will consist of clearing, grading and levelling activities. Crushing activities will occur in parallel with the access road construction.

2.2.2.5 Parking Areas

Parking areas for staff of HIW and its partners will be located in appropriate locations, such as construction compounds and laydown yards.

2.3 Proposed Schedule

Table 2-1 below outlines the anticipated timelines for the development of the HIWEC:

HIWEC Milestone	Anticipated Date
Host Public Information Centre #1	February, 2015
Complete Interim Draft EA Reports	June, 2015
Host Public Information Centre #2	July, 2015
Submit Final Draft EA Report to HIFN	August, 2015
Permit Decision by HIFN	December, 2015
Obtain Pre-Construction Permits	March, 2016
Start Construction	May, 2016
Commence Operations and Maintenance	January, 2018

Table 2-1. HIWEC Milestones

2.4 Construction Phase

Activities that may occur during the pre-construction phase include: planning and resource management, preconstruction surveys, geotechnical investigations, Met tower installation, permitting and detailed design.

The construction phase may consist of the following key activities:

- Site preparation
 - Delineation of work area and installation of erosion and sedimentation control measures
 - Vegetation clearing and site grading
 - Delineation and preparation of temporary work areas
- Construction of access roads and laydown areas
 - Construction of access roads as required (including blasting)
 - Installation of temporary facilities including concrete batch plant(s), crusher(s), WTG staging areas, construction compounds and laydown yards
- Transportation of equipment and materials
 - On-site delivery of construction vehicles, equipment and materials
- Foundation excavation and construction
 - Installation (includes excavation, blasting and construction as required) of WTG foundations
 - Installation (includes excavation, blasting and construction as required) of crane pads
 - Installation (includes excavation, blasting and construction as required) of pad-mounted transformers
 - Installation (includes excavation, blasting and construction as required) of TS foundations
 - Installation (includes excavation, blasting and construction as required) of O&M foundation and building
- WTG installation
 - Erection of WTGs
- Collector system and transmission line installation
 - Installation of above and / or below ground electrical collector lines
 - Installation of on-Reserve transmission infrastructure
- Installation of TSs
- Construction completion
 - Reclamation of temporary construction areas
 - Demobilization of construction works
- Power connection and commissioning

2.5 **Operations Phase**

The HIWEC will be designed to operate for 30+ years; however, it is not uncommon for well-maintained facilities to extend beyond this design life. With the exception of routine and unplanned maintenance, it is expected that operation of the HIWEC will be 24 hours a day, 7 days a week. The HIWEC will be controlled and monitored remotely 24 hours a day via computer, with a team of locally based turbine technicians conducting routine maintenance and repairs. Operation is anticipated to require up to 15 trained technical and administrative staff, including WTG maintenance technicians and a site supervisor.



The operations and maintenance phase may consist of the following key activities:

- HIWEC operation
 - WTG operation
 - Meter calibrations
 - Met tower data acquisition
- WTG, collector system, road and crossing repair / maintenance
 - Preventative and unplanned maintenance of HIWEC components (includes accessing such components)
 - Maintenance of the collector system and any on-Reserve transmission lines (includes accessing such components)
 - Access road maintenance
- Environmental monitoring

The safe operation of the proposed HIWEC will involve the real-time collection of a series of operations parameters, including: wind speed, wind direction, air temperature, atmospheric pressure and electrical parameters. This real-time monitoring of WTG functioning is essential to reduce unplanned outage events and duration by detecting early changes to WTG performance. To provide accurate on-site monitoring of climatic conditions, up to four (4) Met towers up to 100 m tall will be installed for the HIWEC (three (3) have been installed and one (1) will be installed in summer 2015). An additional Sonic Detection and Ranging (SODAR) unit has also been installed adjacent to one Met tower to supplement meteorological data collected from the tower. Nacelle-mounted meteorological data collection points will be located further than 5 km from the nearest data collection point.

If temperature and humidity conditions result in ice formation on WTG blades, sensors installed on each WTG will detect ice build-up by monitoring vibrations, imbalances and generation efficiency. If an event occurs that is considered to be out of the normal operating range for a WTG, the WTG will be taken out of service immediately. Through the SCADA system, the status of the WTG will be reported to the HIWEC operator. WTGs that have been shut down will not be re-started until a site visit has been conducted to inspect the WTG and an investigation is completed that deems the WTG safe. Operational logs will be kept by technical staff that will document HIWEC operations (including WTG shutdowns) and communications with the public and agencies.

Routine preventative maintenance activities will be scheduled at approximately six month intervals with specific maintenance tasks scheduled for each interval. Scheduled maintenance activities for WTGs will include a complete inspection of the tower and components, functionality testing, replacement of any worn parts, and lubrication of moving parts. Following all maintenance work on WTGs the area in the vicinity of the WTGs will be thoroughly cleaned to ensure continued safe operation.

WTGs are very reliable and major components are designed to operate for over 20 years. However, there is a possibility that component failure may occur despite the reliability of the WTGs fleet-wide. Most commonly, the failure of small components such as switches, fans or sensors will take the WTG out of service until the facility component is replaced. These repairs can usually be carried out by a single crew visiting the WTG for several hours. Events involving the replacement of a major component such as a gearbox or rotor are rare. If they do occur, the use of large equipment, sometimes as large as that which was used to install the WTGs, may be required.

The collector lines and TSs will require periodic preventative maintenance activities. Routine maintenance will include condition assessment for aboveground infrastructure and protective relay maintenance of the TSs, in addition to monitoring of the secondary containment systems for traces of oil. Vegetation control will be required around the collector lines and on-Reserve transmission line to prevent any damage to the lines and ensure safe operation. The vegetation is typically cleared by mechanized equipment (e.g., chainsaw/hydro axe).

2.6 Decommissioning Phase

Although the HIWEC is expected to operate for 30+ years, it could also be repowered prior to considering any decommissioning activities to extend the design life. Repowering may involve switching / upgrading gearboxes and generators, replacing WTG blades, and upgrading electrical equipment.

The decommissioning phase may include the following key activities, at the discretion of HIFN:

- Power disconnection and decommissioning of service
 - Disconnection of collector TSs
- Transportation of materials
 - On-site delivery of decommissioning vehicles and equipment
 - Removal of HIWEC components and infrastructure from site
- Disassembly and removal of collector system components
 - Disassembly and removal of collector TSs
 - Disassembly and removal of pad-mounted transformers
 - Disassembly and removal of above and / or below ground electrical collector lines
 - Disassembly and removal of on-Reserve transmission infrastructure
- WTG and / or tower disassembly and removal
 - Disassembly and removal of WTG infrastructure
 - Disassembly and removal of Met towers
- Disassembly and removal of O&M building infrastructure
- Decommissioning completion
 - Reclamation of disturbed areas (includes reclamation of access roads)
 - Grading of concrete foundations
 - Demobilization of decommissioning works

The specific schedule for decommissioning will be determined at the time it is undertaken.

3 Environmental Assessment Methodology

3.1 Scope of the Assessment

As the proposed 300 MW HIWEC is to be located on HIFIN I.R. #2, it is subject to the HIFN EA process under the FNLMA and Land Code in accordance with the HIFN EA Guidance requirements. As stated in **Section 1.3.1**, the main body of this EA document is structured similar to typical federal EA requirements while the appendices are structured similar to typical provincial requirements.

According to the HIFN EA Guidance document, the EA must consider all proposed works, undertakings, and activities related to the HIWEC, including its construction and operation. Therefore, the scope of the assessment includes the permanent and temporary components and activities described in **Section 2**.

The scope of the assessment defines the factors that are to be considered in the EA, which are detailed in the HIFN EA Guidance document and outlined in the following sections.

3.1.1 Factors of Assessment

As per the HIFN EA Guidance document, the focus of this EA is to assess and design the HIWEC so as to avoid, minimize, or mitigate adverse effects on the environment. To address this focus, the EA will consider the following factors:

- 1. the environmental effects of the HIWEC, on- and off-Reserve, including the effects of malfunctions or accidents that may occur in connection with the HIWEC;
- 2. measures that are technically and economically feasible that would mitigate adverse environmental effects;
- 3. in reference to the effects considered in factors (1) and (2), the significance of the effects which are likely, taking into account proposed mitigation measures;
- 4. a follow-up program on-Reserve to verify the accuracy of the EA of the HIWEC and determine the effectiveness of any mitigation measures;
- 5. comments from the HIFN community and the public on the HIWEC that are received in accordance with the consultation process identified in the HIFN EA Guidance document;
- 6. potential environmental effects of the HIWEC that may overlap with potential environmental effects of the off-Reserve Transmission Line;
- 7. potential overlapping environmental effects of accidents and malfunctions from the HIWEC and off-Reserve Transmission Line;
- 8. cumulative environmental effects that are likely to arise from the combination of (i) the HIWEC, the off-Reserve Transmission Line, and their overlapping effects, and (ii) other projects and activities that have occurred or are reasonably foreseeable;
- 9. measures that are technically and economically feasible that would mitigate adverse cumulative environmental effects;
- 10. in reference to the effects considered in factors (6)-(9), the significance of the cumulative effects which are likely, taking into account proposed mitigation measures;



- 11. recommendations for monitoring and follow-up programs to verify the accuracy of the overlapping effects that are on-Reserve and determine the effectiveness, on-Reserve, of any mitigation measures proposed to address overlapping effects; and
- 12. comments from HIFN and the public on overlapping or cumulative effects that are received in accordance with the consultation processes identified in HIFN EA Guidance document.

In addition to the above mentioned factors, the EA will also consider:

- Nishshing Aki (see definition below) identified through Aboriginal traditional knowledge of HIFN; and
- comments from other Aboriginal communities, stakeholders and agencies on the HIWEC that are received in accordance with the consultation processes identified in the HIFN EA Guidance document.

To focus the assessment on what is most relevant in the environment, Nishshing Aki and valued ecosystem components (VECs) have been identified. Nishshing Aki are defined as existing social, cultural, or economic features or conditions that have been (i) identified as valued by HIFN, or (ii) designated as valued by HIFN with community input as provided in the Land Code; these are listed in **Table 3-1**. VECs are defined as existing components of the environment that have recognized ecological value in existing science, law, or policy. The VECs that were examined in the assessment process include both biophysical and socioeconomic environmental components and are also listed in **Table 3-1**. A description of how the VECs were selected is provided in **Section 3.2.3**. The EA evaluates the interaction between HIWEC components and activities and the Nishshing Aki and VECs.

Valued Ecosystem Components	Nishshing Aki
 Soils and Terrain Groundwater Wildlife and Wildlife Habitat Vegetation and Ecological Communities Surface Water Fish and Fish Habitat Species at Risk Land and Resources Used for Traditional Purposes by Aboriginal Persons Cultural Resources/Heritage and Archaeological Sites Noise Visual Landscape 	 Sacred sites Burial grounds Old settlements

Table 3-1. Valued Ecosystem Components and Nishshing Aki

3.1.2 Spatial and Temporal Boundaries

The spatial and temporal boundaries define the time-based and geographic limits of the assessment.

The HIWEC study area is shown on **Figure 2-1**. The HIWEC study area includes HIFN I.R. #2 plus a 550 m buffer extending beyond the HIFN I.R. #2 boundary. The HIWEC study area is sufficient in size to include all of the HIWEC components, phases and activities. The HIWEC regional study area includes the HIWEC study area as well as the adjacent Municipality of Killarney and the geographic municipalities of Henvey Township and Mowat Township are two unincorporated townships that are part of the Parry Sound District which do not have local level governance or any local service boards that provide typical municipal services. The trans-boundary (cross-border) spatial extent refers to any effects that may have a potential impact outside the boundaries of the province of Ontario.



Biophysical effects have been assessed within the HIWEC study area, all socio-economic effects (excluding acoustic) have been assessed within the HIWEC regional study area, and all acoustic impacts have been assessed within 2000 m of a WTG.

The temporal boundaries for each phase of the HIWEC are defined below:

- Construction Phase May 2016 to January 2018
- Operation Phase January 2018 to January 2048
- Decommissioning Phase January 2048 to September 2049

Based on the timing of the phases, the overall temporal boundary for the assessment is from May 2016 to September 2049.

The above mentioned spatial and temporal boundaries are considered a minimum and some exceptions to these boundaries may apply for different environmental components, features or effects. If any exceptions are considered for this EA, they will be identified with the appropriate component in the effects assessment chapter, to be included in the Final Draft EA Report. In addition, HIW maintains the right to adjust study area boundaries as the EA progresses, where new information supports a change.

3.2 Methodology

Based on the HIFN EA Guidance document, the following steps outline the methodology for the EA:

- 1. Determine the location and scale of the HIWEC and all on-Reserve related undertakings and activities;
- 2. Determine spatial and temporal boundaries (revise if necessary, as the EA progresses);
- 3. Identify Nishshing Aki and VECs that have the potential to be affected;
- 4. Complete background data collection and baseline field studies to obtain information on the Nishshing Aki and VECs;
- 5. Predict the potential environmental effects of the HIWEC on the Nishshing Aki and VECs on- and off-Reserve and propose mitigation measures to address these effects;
- 6. Determine the residual effects of the HIWEC on the Nishshing Aki and VECs;
- 7. Determine the significance of residual effects of the HIWEC on the Nishshing Aki and VECs;
- 8. Predict the overlapping residual effects on Nishshing Aki and VECs of the HIWEC and the off-Reserve Transmission Line;
- 9. Determine the significance of the residual overlapping effects on Nishshing Aki and VECs;
- 10. Determine likely environmental effects from accidents and malfunctions and the effects the environment will have on the HIWEC;
- 11. Predict the cumulative effects on Nishshing Aki and VECs that are likely to arise from the combination of (i) the overlapping effects of the HIWEC and the off-Reserve Transmission Line and (ii) other projects and activities that have occurred or are reasonably foreseeable;
- 12. Determine the significance of the cumulative effects on Nishshing Aki and VECs; and
- 13. Propose monitoring and follow-up plans that are required for the HIWEC and recommended for the off-Reserve Transmission Line.

3.2.1 Aboriginal Traditional Knowledge

The HIFN EA Guidance document defines Aboriginal traditional knowledge as the cumulative knowledge held by Aboriginal peoples through generations of living in close contact with nature. It encompasses cultural, environmental, economic, political and spiritual inter-relationships.

Traditional knowledge for HIFN was gathered from secondary sources, as well as through a traditional knowledge study that was conducted in 2013 related to the Highway 69 widening project. In the *Traditional Land Use Study Related to Proposed Four Lane Highway* 69, HIFN community members and groups were interviewed to provide information on historic and current land uses within the community's traditional territory (HIFN, 2013). The traditional knowledge report provided to the EA team was used internally, and in discussion with HIFN Chief and Council, to identify Nishshing Aki and VECs and establish avoidance and / or mitigation strategies.

In addition, traditional knowledge of other Aboriginal communities as well as Métis that has been made available to the EA team was taken into account in selecting VECs, assessing the impacts of the HIWEC and proposing mitigation measures.

3.2.2 Consultation Program Feedback

Consultation with HIFN Council and the community was completed at key stages in the EA process for the HIWEC and primarily included community meetings and other opportunities for community members to comment (e.g., through contact phone number / email and comment forms on the HIWEC website). Consultation with the public off-reserve was also conducted which included separate public notices, meetings and opportunity for comment. A summary of all engagement activities throughout the EA process will be included in the Consultation Report, to be included in the Final Draft EA Report.

All comments that were received from HIFN, other Aboriginal communities, municipalities, agencies, stakeholders, the general public, and landowners were considered in the assessment process. Where applicable, consultation activities have influenced the identification of Nishshing Aki and VECs, contributed to mitigation development, and provided feedback to improve the consultation process.

3.2.3 Selection of Nishshing Aki and Valued Ecosystem Components

As described in **Section 3.1.1**, the Nishshing Aki and VECs were identified to focus the assessment on what is most relevant in the environment to HIFN and to guide the information that was collected as part of the review of existing environmental conditions. The Nishshing Aki are identified in the HIFN EA Guidance document and include existing social, cultural, or economic features on HIFN I.R. #2 lands that are valued by HIFN and must be protected.

In addition to the Nishshing Aki, to ensure a comprehensive review of the potential environmental effects of the HIWEC, HIW considered the following items when developing the VECs:

- Input from HIFN;
- Federal and provincial law and guidance; and
- Any other source HIW considered to be relevant, such as scientific or academic publications or input from the public.

A full list of VECs, as well as their interactions with HIWEC components and activities, will be provided in the Final Draft EA Report.

3.2.4 Potential Effects and Proposed Mitigation

Potential environmental effects of the HIWEC are determined by assessing the interaction of components and activities of the HIWEC with Nishshing Aki and VECs based on existing environmental conditions.

Mitigation strategies are proposed to address potential adverse environmental effects. The HIFN EA Guidance document defines mitigation as the elimination, reduction, or control of any adverse environmental effect which can also include restitution for any damage caused by such effects through replacement, restoration, compensation, or other means. Proposed mitigation strategies are developed based on federal and provincial law and guidance, industry best practices and previous experience on similar renewable energy projects.

The potential environmental effects and the proposed mitigation measures for the HIWEC will be included in the effects assessment chapter, to be included in the Final Draft EA Report.

3.2.5 Residual Effects and Evaluation of Significance

Residual effects are those environmental effects that are likely to occur, even after proposed mitigation measures are in place. The main purpose of the EA is to assess and design the proposed HIWEC so as to avoid or minimize significant residual adverse environmental effects. In order to assess the significance of residual adverse environmental effects.

- Magnitude: is the effect inconsequential, minor, moderate, or major?
- Spatial Extent: is the effect confined to a small area around a physical work or activity, a larger area within property boundaries, an area beyond property boundaries but confined to Crown land, or a larger area?
- Duration and Frequency: is the effect short-term, medium-term, or long-term? Infrequent, frequent, or continuous?
- Permanence: is the effect reversible?
- Context: is the effect upon a common feature or a sensitive feature?

These criteria are further defined in **Table 3-2**. To assist in determining significance, the degree of effect is also defined in **Table 3-2**. Once the degree of effect is understood, significance can be determined. The final determination of significance will be based on weighing all criteria and identifying the likelihood of the effect occurring. The significance of residual effects is assessed based on professional judgement as well as previous experience on similar projects. Only likely residual adverse effects are advanced for an assessment of significance, whereas positive effects are not carried forward for further consideration.

Table 3-2.	Residual Effects Significance Criteria and Levels
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Residual Effects	Effects Level Definition		
Criteria	Minor	Moderate	Major
Magnitude	Effect is inconsequential or is a minor change compared to existing conditions.	Effect exceeds existing conditions, but is less than federal or provincial regulatory criteria or published guideline values.	Effect exceeds federal or provincial regulatory criteria or published guideline values.
Spatial Extent	Local effects within and / or near the HIWEC study area.	Regional effects.	Trans-boundary (cross border) effects.
Duration and Frequency	Effect is evident only during construction activities and occurs infrequently for short durations.	Effect is evident during the operating phase and occurs infrequently or frequently for short durations.	Effect is evident during operating phase and occurs frequently for long durations or continuously.



Table 3-2. Residual Effects Significance Criteria and Levels

Residual Effects	Effects Level Definition			
Criteria	Minor	Moderate	Major	
Permanence	Effect is readily reversible over a short period of time (e.g. one growing season).	Effect is not readily reversible during the life of the HIWEC.	Effect is permanent.	
Context	Effect is on a common feature.	Effect is on a sensitive feature that is common.	Effect is on a sensitive feature that is not common.	

Based on the criteria in **Table 3-2**, the EA identifies one of the following conclusions for each adverse environmental effect:

- 1. without any mitigation, the effect is not significant;
- 2. after applying identified mitigation, the effect is not significant;
- 3. after applying identified mitigation, the effect is significant; or
- 4. the significance of the effect is uncertain.

3.2.6 Overlapping Effects

After completing the separate assessments of environmental effects from the HIWEC and the off-Reserve Transmission Line the next step is to identify and assess their overlapping environmental effects for significance. This includes adding the residual environmental effects of one to the residual environmental effects of the other, and assessing the adverse environmental effects of the combined impact of the HIWEC and the Transmission Line where they are acting on the same Nishshing Aki or VEC.

This step of the assessment will be documented in **Volume C** of the Final Draft EA Report and includes a description of the potential overlapping environmental effects, proposed mitigation measures and the significance of the residual adverse environmental effects.

3.2.7 Cumulative Effects

In addition to identifying the overlapping effects of the HIWEC and the off-Reserve Transmission Line, the EA also assesses cumulative environmental effects. The cumulative environmental effects are determined by assessing the combined effects of the on- and off-Reserve components with other past, present and reasonably foreseeable future projects and activities.

This step of the assessment will be documented in **Volume C** of the Final Draft EA Report and includes a determination of potential cumulative environmental effects, proposed mitigation measures and the significance of the residual adverse environmental effects.

3.2.8 Proposed Monitoring and Follow-up Plans

Monitoring and follow-up programs are developed in conjunction with proposed mitigation measures for potentially adverse environmental effects (including overlapping and cumulative effects). These programs will allow HIW to determine the effectiveness of the proposed mitigation measures, and verify the accuracy of the EA predictions. During construction and operations monitoring, if adverse environmental effects are determined to be more severe than predicted or if mitigation is less effective than planned, the measures included in the monitoring and follow-up programs will serve as early warning signals that will allow HIW to implement remedial measures in a timely manner, as required.

4 Existing Environment

4.1 Biophysical Environment

4.1.1 Geophysical Environment

4.1.1.1 Soils and Terrain

4.1.1.1.1 Physiography and Topography

The HIWEC study area lies within the Georgian Bay Fringe physiographic region, as defined by Chapman and Putnam (1984). The Georgian Bay Fringe is characterized by a gentle plain that inclines gradually from the shores of Georgian Bay to the Algonquin Highlands, the region that runs approximately north-south along its eastern boundary. Although relief within the Georgian Bay Fringe is generally considered to be low (i.e., less than ~15 m), numerous bare rock knobs and ridges occur which rise above the local ground topography. The character of the land surface across the region is dictated by the irregular bedrock surface that underlies a thin, discontinuous blanket of overburden. Steep-walled valleys and bedrock-controlled features are observed to trend northeast – southwest and are dictated by the fault and fracture network prevalent in the bedrock. Ground elevations within the HIWEC study area generally decline in a southwest direction from a topographic high of approximately 213 m Above Sea Level (mASL) in the southeast portion of the HIWEC study area to a low of about 169 mASL in the northeast and along the shoreline of Georgian Bay (**Figure 4-1**).

4.1.1.1.2 Overburden Geology

4.1.1.1.2.1 Quaternary Geology

Very little overburden is present within the HIWEC study area. Exposed, polished bedrock accounts for much of the surficial geology, with the remainder being characterized by organic deposits which accumulated in low-lying areas and bedrock valleys as well as a bedrock-drift complex consisting of a thin, discontinuous veneer of glaciolacustrine sand and/or gravel, isolated occurrences of ice-contact stratified sands and gravels, and of loose, stony glacial till (OGS, 2003). Where present, the thickness of the overburden generally is less than about 1 m, however, with slightly thicker accumulations of up to 3 m being found in bedrock hollows, topographic lows, and on the lee-side of bedrock knobs in relation to the direction of glacial ice-flow.

The past glacial history of the region is better described through observations of erosional bedrock features such as striae, chattermarks, and roches moutonees. The deposited drift and bedrock erosional features represent the final Late Wisconsinan glacial advance and retreat (Kor, 1989). The following is a description of the quaternary geological deposits found within the HIWEC study area:

Ice-Contact Stratified Deposits and Till

Ice-contact stratified deposits occur in a narrow linear bedrock-controlled valley in the northeastern portion of the HIWEC study area (**Figure 4-2**). This deposit is described by Kor (1989) as rippled, cross-bedded, medium- to coarse-grained sands and fine gravels that are interbedded with loose stony diamict flows.

The till is of a loose sandy to silty sand texture and contains sub-angular clasts derived from local rock types. This deposit was observed by Kor (1989) in protected bedrock hollows and was associated with the ice-contact stratified deposits. Kor (1989) suggests this till may have been more extensively deposited, but was removed by glacial meltwaters.







Glaciolacustrine Deposits

Glaciolacustrine sands and gravels were deposited during the time when the HIWEC study area was submerged by glacial Lake Algonquin. Thicker, more continuous deposits of glaciolacustrine sediments are mapped within the eastern portion of the HIWEC study area and along the existing Highway 69 corridor. These deposits are generally characterized by a coarsening-upward sequence of laminated silts and clays overlain by stratified sand and some gravel, having a maximum thickness of about 4 m within the HIWEC study area (Kor, 1989). Glaciolacustrine sands and gravels are also present within east-west trending narrow bedrock valleys throughout the Parry Sound region.

Glaciofluvial Deposits

Glaciofluvial deposits do not occur within the HIWEC study area in mappable quantities. Minor amounts of sand and gravel were observed overlying glaciolacustrine deposits, indicating drainage during phases of glacial lake decline (Kor, 1989).

Recent Deposits

Recent deposits, swamps and organic deposits are common within the HIWEC study area and are present in lowlying areas and bedrock hollows. These areas commonly exhibit poor drainage and associated marsh-like characteristics.

4.1.1.1.2.2 Economic Geology

High quality aggregate deposits are not common within the Parry Sound region and existing pits most commonly exploit glaciolacustrine deposits, which are too small in size to be a significant economic resource. Quarrying of bedrock resources for road building materials also occurs throughout the area. The location of nearby pits and quarries, regulated under the Aggregate Resources Act, has been included on **Figure 4-2**.

4.1.1.1.2.3 Soil Survey

Soil survey reports published by Agriculture and Agri-Food Canada have not been completed for the HIWEC study area. Available landform and geology terrain mapping published by the Ontario Geological Survey indicates that the majority of the HIWEC study area is classified as a peat and muck organic terrain within a mainly bedrock terrain with low local relief (Mollard, 1981). Soils associated with the large wetland complex in the southern portion of the HIWEC study area are classified mainly as organic within a bedrock terrain possessing low local relief and knobby secondary relief. The soils within this area are designated as mainly wet. The southeastern portion of the HIWEC study area, and along Highway 69, is mapped as bedrock below a veneer of glaciolacustrine sand delta. The soils within this area are described as being mixed wet and dry (Mollard, 1981).

4.1.1.1.3 Erosion and Sedimentation

Soil erosion is the gradual wearing away of the land surface by water, wind, ice and gravity. The transportation, deposition and accumulation of soil is known as sedimentation. Erosion is influenced primarily by four factors: climate, soil type, topography and vegetation. Rainfall is the major climatic factor which contributes to erosion. It causes erosion in two ways: by raindrop impact and by runoff. Although the amount and intensity of rainfall are critical parameters affecting erosion, the seasonal distribution is often more critical. The season of heaviest erosion is characterized by a combination of the most unstable ground condition and the most intensive rainfall. In the HIWEC study area, this occurs in the spring and fall.

The rate of soil erosion may be influenced by landscape, rainstorm characteristics, cover and soil management, and soil type. Soil erodibility tends to increase with a greater content of silt and very fine sand and decrease with a greater

content of coarse sand, clay and organic matter. Within the HIWEC study area, little overburden is present and exposed bedrock accounts for much of the surficial geology with the remainder being characterized by organic deposits which have accumulated in low lying areas and bedrock valleys as well as a bedrock drift complex consisting of a thin, discontinuous veneer of glaciolacustrine and glaciofluvial sand and / or gravel and isolated occurrences of ice-contact stratified sands and gravels (OGS, 2003). The thickness of overburden is generally less than about 1 m across the HIWEC study area with slightly thicker accumulations of up to 3 m being found in bedrock hollows, topographic lows and on the lee-side of bedrock knobs in relation to the direction of glacial ice-flow.

The lengths and steepness of slopes affect the velocity of runoff water, and therefore are the principal surface features affecting erosion on a site. Chapman and Putnam (1984) delineate the HIWEC study area as being within the Georgian Bay Fringe physiographic region which is characterized by a gentle plain that slopes up gradually from the shores of Georgian Bay to the Algonquin Highlands region. Although relief in the Georgian Bay Fringe is generally considered to be low, numerous bare rock knobs and ridges occur which rise above the local ground topography. Due to the absence of overburden material on these topographic highs, minor amounts of sediment are expected to be eroded due to topography.

4.1.1.1.4 Bedrock Geology

The HIWEC study area is situated within the western portion of the Central Gneiss Belt, which comprises the southwestern part of the Grenville Province of the Canadian Shield. The Grenville Front Tectonic Zone lies to the north of the HIWEC study area, and the Central Metasedimentary Belt lies to the south. The Central Gneiss Belt is composed of a complex suite of strongly foliated gneissic and migmatitic rocks of Early to Middle Proterozoic age (Kor, 1991). The Central Gneiss Belt has been further divided into separate lithotectonic domains and sub-domains, each separated by zones of intense metamorphism and based on distinct changes in geological, geophysical, and structural characteristics (Kor, 1991, Davidson *et al.*, 1982). The HIWEC study area is located within the Britt Domain which occupies the eastern shoreline of Georgian Bay north of Parry Sound. The Britt Domain is characterized by a complex of highly deformed layered, migmatitic gneisses of granitic to granodioritic composition that range from pinkish-grey to greyish white in colour and exhibit strong foliation (Bright, 1989). Mineral assemblages correspond to that of the mid- to upper amphibolites facies (Davidson and Morgan, 1981). Biotite gneiss and quartzofeldspathic gneiss are also present. These units are intruded by metamorphosed felsic to intermediate plutonic rocks consisting of massive to foliated monzogranitic to granitic orthogneiss, and a sequence of mafic dikes composed of amphibolite and gabbroic orthogneiss. The suite of metamorphic rocks within the area is intruded by late, unmetamorphosed pegmatitic granite dykes (Bright, 1989).

The HIWEC study area is situated over a folded assemblage of gneissic rocks of the Key Harbour Gneiss Association and intermediate to felsic intrusives (Culshaw *et al.*, 2004a). The Key Harbour Gneiss Association is mapped within the central portion of the HIWEC study area and is characterized by intermediate to felsic leucocratic gneiss, and layered metasedimentary rocks of pink to grey quartz-feldspar-biotite paragneiss. Rocks of the Key Harbour Gneiss Association within the HIWEC study area are mapped as a single unit in **Figure 4-3** due to their similarity in age and generally more mafic composition when compared to the younger, more felsic intrusives.

A later suite of intermediate to felsic intrusive rocks is mapped throughout the HIWEC study area, and becomes more prevalent in the western half of the HIWEC study area. These are characterized by weakly foliated to gneissic grey-coloured hornblende-biotite granodiorite, locally containing potassium feldspar megacrysts, minor tonalite, pink granite, and grey granodiorite (Culshaw *et al.*, 2004b).

4.1.1.1.5 Seismicity

Seismic hazard is quantified by determining the probability of expected ground motion within an area. The Geological Survey of Canada (GSC) is responsible for evaluating regional seismic hazards and preparing seismic



hazard maps based on statistical analysis of past earthquakes and from knowledge of Canada's tectonic and geological structure. The National Building Code uses seismic hazard maps and earthquake load guidelines to design and construct buildings to be as resilient to earthquake damage as possible. According to the 2010 Seismic Hazard Map, prepared by the GSC (2015), the HIWEC study area is situated within a low relative hazard area.

4.1.1.5 Groundwater

4.1.1.5.1 <u>Hydrostratigraphy</u>

Within the Canadian Shield, two (2) separate groundwater systems are identified: a shallow, freshwater system that extends to at least 150 m depth, and a deep saline system that extends down hundreds of metres (Singer and Cheng, 2002; Thorne and Gascoyne, 1993). Groundwater within the shallow freshwater system of the Canadian Shield serves as a source of drinking water for many residents within the Canadian Shield. Geological materials that host and transmit groundwater can be subdivided into two distinct groups based on their ability to allow groundwater movement: aquifers and aquitards. Aquifers are classically defined as a geological unit permeable enough to permit a useable supply of water to be extracted, and aquitards are relatively impermeable units that inhibit groundwater movement. The exposed bedrock of the Central Gneiss Belt within the region is highly fractured within the upper 10 to 20 m (Sykes *et al.*, 2009; Ecoplans Limited, 2007), making it an aquifer unit. It is the secondary permeability created by these fractures that dictate the ease at which groundwater is able to move through the bedrock aquifer, and the intensity and distribution of fractures determines the total porosity, hydraulic conductivity, and infiltration rate within the Precambrian bedrock aquifer (Singer and Cheng, 2002).

Within the HIWEC study area, the pattern of fractures in the bedrock aquifer allows for movement of groundwater, however, this secondary permeability generally decreases with depth (Sykes *et al.* 2009). Overburden deposits, such as the glaciolacustrine sands are also considered aquifer units however, as mentioned in **Section 4.1.1.1.2**; these units are thin and discontinuous and thus are not considered to be significant, although they may be hydraulically connected with the underlying Precambrian bedrock aquifer (Singer and Cheng, 2002). The primary aquifer within the HIWEC study area is within the upper fractured bedrock.

The fundamental characteristics of fractured rock aquifers are the extreme variability in hydraulic properties, such as conductivity and flow direction. In a fractured rock setting, groundwater flows may be extremely high through discrete fractures or faults, creating a defined flow zone. In a purely fractured media, such as in crystalline bedrock environments, groundwater flow in the host rock between these fractures and faults is extremely low and is considered a confining unit.

4.1.1.5.2 Groundwater Recharge and Discharge

Recharge is the term used to describe downward flowing groundwater, that is, from the ground surface toward the water table. Discharge is defined as the movement of groundwater such that the water table intersects the ground surface. Within the Canadian Shield, recharge and downward groundwater movement occurs in topographically high regions, such as the Algonquin Highlands to the east of the HIWEC study area or more locally on bedrock knobs and ridges. Discharge and upward groundwater flow occurs in topographic lows, such as Henvey Inlet or within bedrock valleys and isolated topographic depressions between bedrock knobs (**Figure 4-1**). Throughflow, sub-parallel to ground surface, occurs in areas of low topographic relief at moderate elevations (Sykes *et al.*, 2009). A significant component of the HIWEC study area can be classified as a recharge area due to the dense, interconnected fracture network at surface.

Water table elevation for the HIWEC study area was interpolated from topographic information. For the purpose of this desktop study, the water table is assumed to be directly connected to local surface water features within the HIWEC study area. By means of a GIS mapping technique, a water table elevation map was prepared using



surface water elevation as a point source for water table elevation information (**Figure 4-4**). The resulting water table elevation map indicates a potential groundwater discharge zone in the vicinity of Henvey Inlet and within the western portion of the HIWEC study area.

4.1.1.5.3 Groundwater Flow

Groundwater flow is the result of differences in hydraulic head or, simply stated, water table elevation, from one location to another. Regional groundwater flows from east to west into Georgian Bay. Topographic lows, such as river valleys, can have local effects on the direction of groundwater movement. Groundwater flowpaths frequently bend into river valleys and isolated topographic depressions; examples within the HIWEC study area include Henvey Inlet, Key River, and some of the deeper bedrock hollows and valleys within the lowlands.

Water table contours have been shown to subtly reflect the topographic contours in the region, emphasizing the influence of topography on the shallow groundwater flow system. As illustrated on **Figure 4-4** groundwater flow within the HIWEC is primarily from east to west, except within the central portion of the HIWEC study area, where groundwater likely flows towards Henvey Inlet.

4.1.1.5.4 Groundwater Use

An inventory of private water wells (i.e., domestic, commercial, industrial, etc.) was performed within a radius of approximately 1,000 m from the HIFN I.R. #2 boundary, by means of searching the Ministry of the Environment and Climate Change (MOECC) Water Well Database. Results are shown in **Figure 4-2**, along with the primary use of each well. A total of 28 water well records were found located within the 1,000 m search area radius, of which only six (6) are located within HIFN I.R. #2. A review of the water well records indicates that the majority (88%) of wells are completed in bedrock and range in depth between about 3.1 and 79.2 m. Two (2) of the located wells are reported to be completed in overburden material (sand) and are located on the north side of Key River, outside of the HIWEC study area.

As shown in **Table 4-1**, available well records indicate that 61% of groundwater use within the 1,000 m search area radius is for domestic purposes, followed by commercial use (11%), and public and municipal supply use (11%). Approximately 18% of MOECC water well records specified the primary use as 'Not Used' or 'Monitoring and Test Hole', which indicates those wells are not used as a groundwater supply.

Primary Well Use	Number
Commercial	3
Domestic	17
Monitoring and Test Hole	3
Municipal	1
Not Used	2
Public	2
Total	28

Table 4-1. Summary of MOECC Water Well Records

A detailed door-to-door water well survey will be performed to collect hydrogeological data and well construction details for actively used groundwater supply wells within the 1,000 m search area radius to the east and south of the HIFN I.R. #2 boundary. The 1,000 m search area radius will not be extended to the north of the HIFN I.R. #2 boundary as hydrogeological impacts are not anticipated across the Key River. There are no wells to the west of


the HIFN I.R. #2 boundary. The water well survey will include a detailed questionnaire regarding pertinent water well information such as: contact information; well location; past water quality concerns; well construction details; well depth; pump setting details; historic and current water usage; and water treatment system details.

To identify potential effects from construction or operation of the HIWEC on groundwater quality, quantity or movement, a hydrogeological assessment will be conducted to:

- Assess potential water-taking requirements during the construction phase; and,
- Assess the potential for WTG foundations and any associated buried services to alter or change shallow groundwater flow patterns and the potential impact on local wells, or ecological features (wetlands or streams).

A desktop study will be completed and included in the Final Draft EA Report that will examine potential water-taking and effects on local wells identified in the door-to-door survey or any ecological features.

4.1.2 Atmospheric Environment

4.1.2.1 Climate

The HIWEC study area is located within the Georgian Bay Ecoregion, situated on the southern portion of the Precambrian Shield in south-central Ontario. The climate of this ecoregion is cool-temperate and humid, and falls within the Humid High Moderate Temperature Ecoclimate Region. The mean annual temperature range is between 2.8 to 6.2°C, and the mean length of growing season is between 183 to 219 days. The mean summer rainfall is between 204 and 304 mm, with annual precipitation ranging between 771 and 1,134 mm (Crins *et al.*, 2009).

Monthly climatic statistics for the HIWEC study area were derived from Environment Canada's nearest long-term monitoring station, Monetville, Ontario, as shown in **Table 4-2**. The Monetville, Ontario station is located approximately 30 km northwest from the HIWEC study area (Environment Canada, 2015a).

	Monetville, Ontario ¹							
Month	Daily Average Temperature (°C)	Daily Minimum Temperature (°C)	Daily Maximum Temperature (°C)	Monthly Average Rainfall (mm)	Monthly Average Snow Fall (cm)			
January	-12.0	-17.5	-6.4	17.4	63.2			
February	-9.3	-15.0	-3.5	12.3	48.8			
March	-4.2	-9.9	1.5	35.4	29.4			
April	4.4	-1.5	10.3	55.8	12.7			
Мау	11.2	4.7	17.5	94.8	1.4			
June	16.4	10.0	22.9	76.9	0.0			
July	19.4	13.0	25.8	85.3	0.0			
August	18.0	11.6	24.3	85.0	0.0			
September	13.5	8.0	18.9	103.3	0.0			
October	6.7	1.8	11.5	100.6	3.9			
November	-0.0	-3.9	3.9	67.3	29.0			
December	-7.3	-12.0	-2.6	24.8	58.2			

 Table 4-2.
 Monthly Average Climatic Statistics for Monetville, Ontario (1981-2010)

Source: Environment Canada, 2015a

Monetville Station: 46 °08'33.006"N 80 °18'25.044"W, Elevation 221.00 m

4.1.2.2 Air Quality

The MOECC Air Quality Index (AQI) is an indicator of air quality in Ontario, based on air pollutants that are known to have adverse effects on human health and the environment; these include ozone, fine particulate matter, nitrogen dioxide, carbon monoxide, sulphur dioxide and total reduced sulphur compounds. MOECC developed the following categories for AQI readings:

- below 16 is categorized as very good;
- 16 to 31 is good;
- 32 to 49 is moderate but there may be some adverse effects on very sensitive people;
- 50 to 99 is poor and may have adverse effects on sensitive human and animal populations and may cause significant damage to vegetation and property; and
- above 99 is categorized as very poor and may have adverse effects on a large proportion of those exposed (MOECC, 2010a).

The Parry Sound AQI monitoring station is the closest station to the HIWEC study area, located approximately 70 km southwest. The 2014 daily data from this station shows an average AQI of 22.38 (good) with a standard deviation of 6.10. The lowest recorded AQI in 2014 was 7 (very good) on September 30 and October 16 and the highest recorded AQI was 45 (moderate) on May 26 (MOECC, 2014).

4.1.3 Terrestrial Environment

In accordance with the HIFN EA Guidance document, available resources and existing data pertaining to the terrestrial environment in the HIWEC study area was reviewed. Information obtained from this background review includes the location and characteristics of known or potential wildlife occurrences and wildlife habitat, vegetation and ecological communities including wetlands, Species of Conservation Concern (SOCC) and SAR occurrences.

The background review was conducted for the entire HIWEC study area to accommodate any potential changes to the proposed HIWEC layout that may occur during the planning stages. The following secondary resources were consulted:

Guidance Documents:

- Significant Wildlife Habitat Technical Guide (MNRF, 2000);
- Natural Heritage Assessment Guide for Renewable Energy Projects (MNRF, 2012a); and
- Draft Significant Wildlife Habitat Ecoregion 5E Criterion Schedule (MNRF, 2012b).

• Interactive Mapping Sites:

- MNRF Make-A-Map: Natural Heritage Areas (2014a);
- MNRF NHIC Rare Species Records (2014b);
- MNRF Species at Risk by Area Online Search Tool (2014c); and
- Ontario Provincial Parks website (Ontario Parks, 2013).

• Wildlife Atlases:

- Ontario Breeding Bird Atlas (OBBA) Website (BSC, et al., 2006);
- Important Bird Areas (IBA Canada, 2013);
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2014); and
- Atlas of the Mammals of Ontario (Dobbyn, 1994).



- MNRF Natural Resources and Values Information System (NRVIS) (MNRF, 2014d) mapping from Land Information Ontario (LIO) for:
 - Provincial Parks;
 - Conservation Reserves;
 - Provincially Significant Wetlands (PSWs);
 - Unevaluated Wetlands;
 - Wooded Areas;
 - Confirmed Important Wildlife Habitat (IWH)¹ including:
 - Bat Hibernacula;
 - Raptor Nesting Sites;
 - Moose Aquatic Feeding Areas;
 - Deer Yard or Wintering Areas; and
 - Areas of Natural and Scientific Interest (ANSIs).

Figure 4-5 illustrates the terrestrial environment features identified through the background review, for which mapping is produced / available.

4.1.3.1 Previous Field Studies

Field studies were conducted within the HIWEC study area by LGL in 2011 and 2012, and by Stantec Consulting Ltd. (Stantec) in 2013. Available information regarding these field studies is summarized below.

The Nigig Power Corp/Henvey Inlet Wind Project Preliminary Environmental Constraints Analysis (Neegan Burnside Ltd., 2011) provides a preliminary analysis of the environmental and regulatory constraints for the HIWEC study area, and summarizes the findings of ecological studies completed by LGL in 2011. This report was reviewed for the purpose of this background review.

In addition, Stantec conducted the following field studies in 2013 for the HIWEC study area as per their 2013 *Terrestrial Survey Work Program* (Stantec, 2013) to determine baseline conditions:

- Raptor Migration Surveys;
- Passerine Migration Surveys;
- Waterfowl Migration Surveys;
- Breeding Bird Surveys;
- Herpetological Surveys;
- Bat (Acoustic Monitoring) Surveys;
- Ecosite Classification and Rare Flora Surveys; and
- Incidental Wildlife Observations.

Stantec provided raw field and GIS data collected by Stantec staff during the 2013 field season to AECOM in October 2014. LGL provided collated field data collected by LGL during the 2011 and 2012 field seasons to AECOM in April 2015. This data was summarized by AECOM into technical memorandums (hereafter collectively referred to as the "Technical Memos" which will be provided in the Final Draft EA Report).

Information from the previous field studies described above that is relevant to the VECs for the terrestrial environment is summarized in the following sections.

^{1.} **Important Wildlife Habitat (IWH):** A wildlife habitat that is ecologically important in terms of features, functions, representation or amount and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System.



ap location: P:60333000 Henvy Inlet/900-Work/920-929 (GIS-Graphics)/Design/Baseline Report (Feb 2015)/EA/WE C/Baseline_N

4.1.3.2 Wildlife and Wildlife Habitat

4.1.3.2.1 Birds (Includes Migratory Birds)

The *Migratory Birds Convention Act, 1994 (MBCA)* provides protection to migratory birds, their habitats and nests at the federal level by prohibiting the destruction of active migratory bird nests. Currently, 700 migratory bird species are protected under the *MBCA*, including songbirds, woodland birds, waterfowl, shorebirds and seabirds.

The following bird habitats (including birds listed under the *MBCA*) were identified as potentially occurring in the HIWEC study area through the background review:

- Waterfowl Stopover and Staging Areas (Aquatic) There are many lakes, beaver ponds and wetlands located within the HIWEC study area. All of these areas including the shoreline of Georgian Bay, Key River and Henvey Inlet have potential to support aquatic waterfowl stopover and staging areas. A total of 16 waterfowl species were recorded within the HIWEC study area in 2013 (AECOM, 2015). The MNRF has documented waterfowl stop-over areas, travel routes and nesting areas along Henvey Inlet (Neegan Burnside Ltd., 2011); these are considered historical records.
- Shorebird Migratory Stopover Areas (Shorebird Staging) The HIWEC study area is dominated by rock barrens and bounded by lakeshores of Georgian Bay, Sandy Bay, Key River and Henvey Inlet. Additionally, there are numerous wetlands. These areas have the potential to support shorebird migratory stopover areas. No shorebirds were recorded by Stantec within the HIWEC study area in 2013 (AECOM, 2015).
- Colonially-Nesting Bird Breeding Habitat (Bank and Cliff) The HIWEC study area is unlikely to contain sand banks large enough to support a nesting swallow colony. There are a few rock cliffs in the HIWEC study area. Some of these could provide suitable habitat for Cliff Swallows (*Petrochelidon pyrrhonota*). However, no bank or cliff colonially-nesting bird species were recorded in the HIWEC study area in 2013 (AECOM, 2015).
- Colonially-Nesting Bird Breeding Habitat (Trees/Shrubs) There are numerous wetlands located within the HIWEC study area, which may provide habitat for colonially tree nesting bird species (AECOM, 2015). Great Blue Heron was recorded in the HIWEC study area in 2013 (AECOM, 2015). A total of 12 potential or active Great Blue Heron nests were identified in the HIWEC study area in 2011 (Neegan Burnside Ltd., 2011).
- Colonially-Nesting Bird Breeding Habitat (Ground) Suitable habitats for colonially-nesting ground breeding birds may occur on the shoreline of Georgian Bay, Key River, Henvey Inlet and Sandy Bay within the HIWEC study area (AECOM, 2015). Five (5) colonially ground-nesting bird species were recorded in the HIWEC study area in 2013 (AECOM, 2015). The Northern Georgian Bay Shoreline and Islands Conservation Reserve provides habitat for Caspian Terns (*Hydroprogne caspia*) (Neegan Burnside Ltd., 2011).
- Waterfowl Nesting Areas There are several wetlands located within the HIWEC study area which may provide habitat for waterfowl nesting (AECOM, 2015). A total of 16 waterfowl species were recorded in the HIWEC study area in 2013 (AECOM, 2015).
- Bald Eagle and Osprey Nesting, Foraging and Perching Habitat The HIWEC study area includes wooded areas and is bordered by the Key River, Georgian Bay, Henvey Inlet and Sandy Bay (MNRF, 2014a). Both species and two large stick nests were also recorded in the HIWEC study area in 2013 (AECOM, 2015).
- Woodland Raptor Nesting Habitat The HIWEC study area includes wooded areas, which may support
 woodland raptor nesting habitat (AECOM, 2015). Twelve raptor species and two stick nests were
 recorded in the HIWEC study area in 2013 (AECOM, 2015).



- Mast Producing Areas Mature forests containing an abundance of mast-producing species may occur within the wooded areas in the HIWEC study area (AECOM, 2015). Ruffed Grouse (*Bonasa umbellus*), a target species for this habitat type, was recorded with the HIWEC study area in 2013 (AECOM, 2015).
- Marsh Bird Breeding Habitat Wetlands within the HIWEC study area may provide suitable marsh bird breeding habitat (AECOM, 2015). A total of ten (10) marsh breeding bird species were recorded in the HIWEC study area in 2013 (AECOM, 2015).

The presence, boundaries and characteristics of these IWH within the HIWEC study area will be determined during the field studies scheduled in the spring and summer 2015.

4.1.3.2.2 <u>Mammals</u>

The following mammal habitats were identified as potentially occurring in the HIWEC study area through the background review:

- Bat Hibernacula There is an abandoned mine located within the HIWEC study area. Additionally, caves may occur within the HIWEC study area. These features may support bat hibernacula. Acoustic monitoring conducted in the HIWEC study area in 2013 indicates that all five of the target species for this habitat type are potentially present (AECOM, 2015).
- Bat Maternity Colonies There are mixed and coniferous forest stands located in the HIWEC study area, which may contain suitable bat cavity trees (AECOM, 2015). Acoustic monitoring conducted in the HIWEC study area in 2013 confirmed the presence of Silver-haired Bat and indicates that the remaining three (3) target species for this habitat type may also be present (AECOM, 2015).
- Deer Yarding Areas Deer yarding areas are typically determined and mapped by the MNRF. There are no important deer winter congregation areas as identified by the MNRF within or in close proximity to the HIWEC study area. However, because the MNRF does not have jurisdiction over the HIFN I.R. #2, deer yarding areas cannot be ruled out. The presence of this IWH type was confirmed during the field investigations completed in 2015.
- Aquatic Feeding Habitat Aquatic feeding habitats may occur in association with wetlands, rivers, lakes and beaver ponds in the HIWEC study area (AECOM, 2015). Evidence of Moose and Whitetailed Deer, target species for this habitat type, was recorded in the HIWEC study area in 2013 (AECOM, 2015). There are several Moose Aquatic Feeding Areas located in the HIWEC regional study area but outside of the HIWEC study area (refer to Figure 4-5).
- *Mineral Licks* Mineral licks may occur in association with seeps and springs located in wooded areas in the HIWEC study area. Evidence of Moose and White-tailed Deer, target species for this habitat type, was recorded in the HIWEC study area in 2013 (AECOM, 2015).
- Denning Sites for Mink, Otter, Marten, Fisher and Eastern Wolf Denning sites may occur within wooded areas in the HIWEC study area (AECOM, 2015). North American River Otter (*Lontra canadensis*) and Eastern Wolf (*Canis lupus lycaon*) were recorded in the HIWEC study area in 2013 (AECOM, 2015). Mink and Otter are known to occupy beaver ponds and use abandoned lodges and bank dens in the HIWEC study area (Neegan Burnside Ltd., 2011).
- Mast Producing Areas Mature forests containing an abundance of mast-producing species may occur within the wooded areas in the HIWEC study area (AECOM, 2015). Black Bear and White-tailed Deer were recorded with the HIWEC study area in 2013 (AECOM, 2015).
- Deer Movement Corridors Deer Movement Corridors may occur in association with deer yarding areas in the HIWEC study area.
- *Furbearer Movement Corridors* Furbearer movement corridors may occur in association with shoreline habitats along lakes, ponds and watercourses in the HIWEC study area.



The presence, boundaries and characteristics of these IWH within the HIWEC study area will be determined during the field studies scheduled in the spring and summer 2015.

4.1.3.2.3 Amphibians

The following amphibian habitats were identified as potentially occurring in the HIWEC study area through the background review:

- Amphibian Breeding Habitat (Woodland) Amphibian breeding habitats (woodland) may occur in association with wetlands, vernal pools, lakes or ponds within wooded areas in the HIWEC study area (AECOM, 2015). A total of five (5) amphibian species were recorded in the HIWEC study area in 2013 (AECOM, 2015). A total of 12 amphibian species were recorded in the HIWEC study area in 2011 (Neegan Burnside Ltd., 2011).
- Amphibian Breeding Habitat (Wetland) Amphibian breeding habitats (wetlands) may occur in association with wetlands in the HIWEC study area (AECOM, 2015). A total of five (5) amphibian species were recorded in the HIWEC study area in 2013, all of which are target species (AECOM, 2015). In addition, Stantec may have heard a Western Chorus Frog calling in 2013, but the presence of this species could not be confirmed (AECOM, 2015). A total of 12 amphibian species were recorded in the HIWEC study area in 2011 (Neegan Burnside Ltd., 2011).
- Amphibian Corridors Amphibian corridors may occur in association with riparian or naturally vegetated areas in the HIWEC study area.

The presence, boundaries and characteristics of these IWH within the HIWEC study area will be determined during the field studies scheduled in the spring and summer 2015.

4.1.3.2.4 Reptiles

The following reptile habitats were identified as potentially occurring in the HIWEC study area through the background review:

- Turtle Wintering Areas There are many fens, bogs, marshes, lakes and beaver ponds located in the HIWEC study area that may provide suitable turtle wintering habitats (AECOM, 2015). These may support turtle wintering areas. Four (4) turtle species were recorded in the HIWEC study area in 2013 (AECOM, 2015). Five (5) turtle species were observed in the HIWEC study area in 2011 (Neegan Burnside Ltd., 2011).
- Reptile Hibernacula There are numerous wetlands in the HIWEC study area, including conifer and shrub swamps which can provide overwintering habitat for reptile species. Additionally, the HIWEC study area is covered by rock barrens (AECOM, 2015). These may support reptile hibernacula. Three (3) snake species and one lizard species were recorded in the HIWEC study area in 2013 (AECOM, 2015). Seven (7) snake species and one (1) lizard species were observed in the vicinity of the HIWEC study area in 2011 (Neegan Burnside Ltd., 2011).
- *Turtle and Lizard Nesting Areas* There are numerous fens, bogs and marshes located in the HIWEC study area that may provide suitable turtle nesting habitats, as well as rock barrens for lizard nesting areas (AECOM, 2015). A total of four (4) turtle species and the one (1) lizard species were recorded in the HIWEC study area in 2013 (AECOM, 2015). A total of five (5) turtle species and one (1) lizard species were recorded in the HIWEC study area in 2013 (AECOM, 2015). A total of five (5) turtle species and one (1) lizard species were recorded in the HIWEC study area in 2011 (Neegan Burnside Ltd., 2011).

The presence, boundaries and characteristics of these IWH within the HIWEC study area will be determined during the field studies scheduled in the spring and summer 2015.

4.1.3.2.5 Species of Conservation Concern

Bird, mammal, amphibian and reptile SOCC with the potential to occur within the HIWEC study area were identified as part of the background review. SOCC for the HIWEC study area are defined as follows:

- Provincially rare species ranked by the Natural Heritage Information Centre (NHIC) as S1 (critically imperiled), S2 (imperiled) or S3 (vulnerable) in the province of Ontario but not listed as Endangered or Threatened under Schedule 1 of the federal *Species at Risk Act, 2002* (*SARA*) or the provincial *Endangered Species Act, 2007* (*ESA*);
- Species listed as Special Concern under Schedule 1 of SARA;
- Species evaluated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Special Concern, Threatened or Endangered but not listed as Endangered or Threatened under Schedule 1 of SARA or the ESA; and
- Species listed as Special Concern under the ESA.

A total of 18 SOCC were identified as occurring or having the potential to occur within the HIWEC study area based on the background review. These are summarized in **Table 4-3**. Of these, 15 species were recorded within the HIWEC study area either by LGL or Stantec in 2011 and 2013, respectively. LGL 2012 data is currently being compiled and will be presented in the Final Draft EA Report.

Although recorded by Stantec in 2013, Long-tailed Duck (*Clangula hyemalis*) and Red-necked Grebe (*Podiceps grisegena*) are migrant species and their breeding ranges are not located in the vicinity of the HIWEC study area (Cadman *et al.*, 2007). Breeding habitat for these species is considered unlikely to be present in the HIWEC study area and therefore these species are not included in **Table 4-3**.

Common Name	Scientific Name	S- rank ¹	ESA Status ²	COSEWIC Status ³	SARA Status ⁴	Observed in 2011	Observed in 2013
Bird Species (9)							
Bald Eagle	Haliaeetus leucocephalus	S2	SC	NAR	NAR	Yes	Yes
Black Tern	Chlidonias niger	S3	SC	NAR	NAR	No	Yes
Caspian Tern	Sterna caspia	S3	NAR	NAR	NAR	No	Yes
Eastern Wood-Pewee	Contopus virens	S4	SC	SC	No Status (No Schedule)	No	Yes
Peregrine Falcon	Falco peregrinus	S3	SC	SC	SC (Schedule 1)	No	No
Prairie Warbler	Setophaga discolor	S3	NAR	NAR	NAR	No	Yes
Rusty Blackbird	Euphagus carolinus	S4	NAR	SC	SC (Schedule 1)	No	Yes
Wood Thrush	Hylocichla mustelina	S4	SC	THR	No Status (No Schedule)	No	Yes
Yellow Rail	Coturnicops noveboracensis	S4	SC	SC	SC (Schedule 1)	No	Yes
Insect Species (3)							
Horned Clubtail	Arigomphus cornutus	S3	-	-	-	No	Yes
Monarch	Danaus plexippus	S2	SC	SC	SC (Schedule 1)	No	Yes
Mottled Darner	Aeshna clepsydra	S3	-	-	-	No	Yes
Mammal Species (1)							
Eastern Wolf	Canis lupus lycaon	S4	SC	SC	SC (Schedule 1)	No	Yes

Table 4-3. SOCC Potentially Occurring in the HIWEC Study Area



Common Name	Scientific Name	S- rank ¹	ESA Status ²	COSEWIC Status ³	SARA Status ⁴	Observed in 2011	Observed in 2013
Reptile Species (5)							
Common Five-lined Skink (Southern Shield population)	Plestiodon fasciatus pop. 2	S3	SC	SC	SC (Schedule 1)	Yes	Yes
Eastern Ribbonsnake	Thamnophis sauritus	S3	SC	SC	SC (Schedule 1)	No	No
Milksnake	Lampropeltis triangulum	S3	SC	SC	SC (Schedule 1)	No	Yes
Northern Map Turtle	Graptemys geographica	S3	SC	SC	SC (Schedule 1)	No	No
Snapping Turtle	Chelydra serpentina	S3	SC	SC	SC (Schedule 1)	Yes	Yes

Table 4-3.SOCC Potentially Occurring in the HIWEC Study Area

Notes: 1, 2, 3, 4 See Notes at the end of Section 4.1

The presence of these species and their habitats will be confirmed during the field studies scheduled in the spring and summer of 2015.

4.1.3.3 Vegetation and Ecological Communities

4.1.3.3.1 Flora

The HIWEC study area is located in the Ecoregion 5E (Georgian Bay Ecoregion) which is situated in south-central Ontario on the Canadian Shield and comprises of 7,447,869 ha. It extends from Lake Superior in the west to the Quebec border in the east (Crins *et al.*, 2009). The majority (32%) of the Ecoregion is dominated by mixed forest. Deciduous forest covers 22%, followed by coniferous forest (12%) and sparse forest (11%). Dominant trees represent a mixture of Great Lakes- St. Lawrence forest species and Boreal forest species, including Eastern White pine (*Pinus strobus*), Red Pine (*Pinus* resinosa), Eastern Hemlock (*Tsuga canadensis*), Black Spruce (*Picea mariana*), White Spruce (*Picea glauca*), Balsam Fir (*Abies balsamea*), Jack Pine (*Pinus banksiana*), Tamarack (*Larix laricina*), Yellow Birch (*Betula allegheniensis*), Sugar Maple (*Acer saccharum*) and other hardwoods (Crins *et al.*, 2009).

Past field studies completed by Stantec in 2013 identified ten (10) general vegetation community series in the HIWEC study area, which included Jack Pine rock barrens (RBT), coniferous forests (FOC) dominated by White Pine and Red Pine, mixed forests (FOM), deciduous forests (FOD), coniferous Swamps (SWC), deciduous swamps (SWD), fens including treed, shrub and open (FET, FES and FEO), meadow and shallow marshes (MAM and MAS), coastal marshes and fens, coastal shallow waters, sandy opening and roadsides (AECOM, 2015). Stantec did not record any provincially or federally protected plant species in 2013 but did identify 22 species that are Regionally Important in Ecodistrict 5E-7 and 63 that are rare in the District of Parry Sound (AECOM, 2015).

Based on the background review, the following Rare Vegetation Communities were identified as potentially occurring within the HIWEC study area:

- Shallow Atlantic Coastal Marshes These rare vegetation communities were recorded within the HIWEC study area in 2013 (AECOM, 2015).
- Cliffs and Talus Slopes The HIWEC study area is dominated by rock barrens (AECOM, 2015). Cliffs may also occur within the HIWEC study area.
- **Precambrian Rock Barrens** The HIWEC study area is located on the Canadian Shield and the landscape is dominated by Pre-Cambrian rock barrens (AECOM, 2015).



- Old-growth or Mature Forests The HIWEC study area contains relatively large tracks of undisturbed wooded areas, wherein old growth or mature forests may occur (AECOM, 2015).
- Bogs There are several types of wetlands, including bogs, located within the HIWEC study area (AECOM, 2015).
- Rare Forests (Red Spruce, Jack Pine and White Oak) The HIWEC study area includes undisturbed wooded areas, wherein rare forests may occur (AECOM, 2015).

Ecological Land Classification (ELC) field studies using the ELC protocol for Southern Ontario as outlined in Lee *et al.* (1998) were partially completed by AECOM in the fall of 2014 to confirm the boundaries, stand structure and species composition of the vegetation community types found within the proposed HIWEC location, with further studies scheduled for spring and summer of 2015. In addition, AECOM delineated and classified vegetation communities to the Ecosite level, where possible, within 120 m of the proposed HIWEC location through aerial photography interpretation.

4.1.3.3.2 Parks and Designated Natural Areas

There are no federal parks; however, there is one (1) Provincial Park and one (1) Provincial Conservation Reserve located in the HIWEC study area as shown on **Figure 4-5**. No HIWEC infrastructure is proposed within these features. The French River Provincial Park (Waterway Class) is situated along the north side of the Key River. It comprises of 52,452 ha of Crown land on the Canadian Shield, and includes the shorelands on both sides of the French River, including the water (MNRF, 2006a and MNRF, 1993). The park is managed according to the Provincial Park Policy and Park Management Plan (MNFR, 1993). It supports and protects more than 450 plants, including rare plant species. The wetlands located at the French River's mouth on Georgian Bay contain the largest community of Virginia Chain Fern (*Woodwardia virginica*) in Ontario, which is considered as a nationally important species. The park also contains and protects habitat and a population of Eastern Massassauga Rattlesnake (*Sistrurus catenatus*), which is a provincially and federally protected species.

The North Georgian Bay Shoreline and Islands Conservation Reserve is located along the south side of the HIFN I.R. #2 lands. This Provincial Conservation Reserve comprises of 20,225 ha and stretches along the coastline and inland environments that support numerous wetlands and wildlife habitat, including habitats for the Eastern Massassauga Rattlesnake and Caspian Tern (*Hydroprogne caspia*) (MNRF, 2006b). The Provincial Conservation Reserve is managed by the general policies in the *Land Use Strategy* (1999) and *Provisions of the Provincial Parks and Conservation Reserve Act* (2006) with possible co-management opportunities with local First Nations (MNRF, 2006b).

There are no Life Science or Earth Science Areas of Natural and Scientific Interest (ANSIs) located within or in the vicinity of the HIWEC study area (AECOM, 2015).

4.1.3.3.3 Wetlands

As described in **Section 4.1.3.3.1**, past surveys completed by Stantec identified several wetland communities in the HIWEC study area including coniferous swamps (SWC), deciduous swamps (SWD), fens including treed, shrub and open (FET, FES and FEO), meadow and shallow marshes (MAM and MAS), coastal marshes and fens, and coastal shallow waters (AECOM, 2015).

AECOM confirmed the presence, boundaries and characteristics of wetland communities within the proposed HIWEC location during field studies completed in the fall of 2014, with further studies scheduled for the spring and summer of 2015.



4.1.3.3.4 Species of Conservation Concern

No plant SOCC were identified as having the potential to occur within the HIWEC study area through the background review, and none were identified during previous field studies completed by LGL and Stantec.

4.1.4 Aquatic Environment

In accordance with the HIFN EA Guidance document, available resources and existing data pertaining to the aquatic environment was reviewed. Information obtained from this background review provides insight, such as where waterbodies occur in the HIWEC study area, their potential to support a fish community, the composition of the existing fish community, critical fish habitat, SAR occurrences, and their cultural, recreational and commercial uses.

The background review was conducted for the entire HIWEC study area to accommodate any potential changes to the proposed HIWEC layout that may occur during the planning stages. **Figure 4-6** illustrates some of the aquatic environment features identified through background review.

The background review was completed to identify the presence of waterbodies, fish and fish habitat, and endangered species / SAR, located within or in the immediate vicinity of the HIWEC study area using the following secondary resources:

- Interactive Mapping Sites:
 - MNRF Make-A-Map: Natural Heritage Areas (2015);
 - MNRF NHIC Rare Species Records (2014b);
 - MNRF SAR by Area Online Search Tool (2014c); and
 - Ontario Provincial Parks website (Ontario Parks, 2013).
- MNRF's Natural Resources and Values Information System (NRVIS) mapping from Land Information Ontario (LIO) for:
 - Waterbody, watercourse, wetland layers;
 - Thermal Regime; and
 - Fish Records.

A request for information was submitted to MNRF's, Parry Sound District office on January 27 and February 17, 2015 for any data gaps identified during the background information review.

Data collected will be confirmed, and supplemented during aquatic habitat field assessments scheduled for spring and summer 2015. Results of the records review, site investigations and analysis will be presented in the Final Draft EA Report (to be finalized following completion of field work).

4.1.4.1 Previous Field Studies

Field studies on the aquatic environment were conducted within the HIWEC study area by Tulloch Engineering in 2013. Available information regarding the aquatic component of these field studies is summarized in the following sections.

The Nigig Power Corp/Henvey Inlet Wind Project Preliminary Environmental Constraints Analysis (Neegan Burnside Ltd. Preliminary Report (2011)) is a preliminary review and records search conducted by Neegan Burnside Ltd. This report summarizes the findings of available data and ecological studies, including those completed by LGL in 2011, however the location of records of certain species is not always specified (i.e., whether



the record came from the HIWEC study area or one of the alternative Transmission Line routes). Given that these records are from the same geographic area as the current HIWEC study area, all species observed by LGL in 2011 as reported in the Neegan Burnside Ltd. Preliminary Report (2011) were included in the background review. Fisheries data obtained from the Neegan Burnside Ltd. Preliminary Report (2011) pertains to the coastal habitats of Georgian Bay and Henley Inlet only. This included a list of game fish species that are known to inhabit these habitats, plus mapping data indicating known game fish spawning grounds within the inlet and eastern shoreline of Georgian Bay in the vicinity of the inlet and HIWEC study area.

The focus of the site investigations conducted by Stantec in 2013 was terrestrial natural features of the HIWEC only.

Fish habitat assessments at randomly-selected sample sites of inland waterbodies were completed by Tulloch Environmental in the summer of 2013. Forty locations were randomly plotted within the HIWEC study area using a transect method. This method was used to account for all potential habitat types and at varying elevations, in order to gain a preliminary assessment of the use of inland waterbodies by fish, and the sensitivity of the fish and fish habitat of these waters. At each site the potential to directly support a fish community based on available habitat, migration barriers and connectivity and water quality was evaluated. Fish community sampling was conducted where this potential was identified, and habitat features of the assessment area were documented.

Tulloch Environmental provided raw field data and GIS data from their 2013 field season to AECOM. The data was assembled into a draft technical memo by AECOM and summarizes the results of Tulloch's field data.

The data is summarized in the following sections.

4.1.4.2 Surface Water

4.1.4.2.1 Waterbodies

Henvey Inlet is part of the Georgian Bay Biosphere Reserve, the Great Lakes Coastal Reserve and the Lake Huron Drainage Basin (MNRF, 2015). The Georgian Bay Biosphere encompasses 347,000 ha of land stretching 300 km from the eastern coast of Port Severn to the French River and includes a mixture of open waters, sheltered bays and coastal wetlands (Georgian Bay Biosphere, 2015). The Lake Huron Drainage basin covers a total area of 134,100 km².

The Henvey Inlet waterbody itself extends the length of HIFN I.R. #2 in an east - west direction. Based on air photo imagery, topographic mapping, background review and field observations, most of the aquatic environment of the inlet can be described as rolling, weathered bedrock shorelines and clear water ranging in depth from 1 m to 12 m. Occasional bedrock or boulder / cobble islands and shoals are present throughout the inlet. Many inland tributaries drain to Henvey Inlet, and in some areas the deposition of sediment at these outlets over time has created conditions conducive to aquatic and riparian vegetation growth; however, these areas were generally uncommon. The clear water, lack of riparian or aquatic vegetation and bedrock or coarse substrate shorelines noted throughout most of the inlet are likely attributed to the wind and water circulation throughout the inlet from its exposure to Georgian Bay. The eastern limit of the inlet is more protected from the wind and wave action of Georgian Bay by shoals, shoreline and islands. As a result, habitat features such as fine substrates, riparian and aquatic vegetation are significantly more prominent at the eastern point of the inlet.

Based on air photo imagery, topographic mapping, background review and field observation, inland waterbodies throughout the HIWEC study area consist mainly of an extensive network of wetlands. Extensive bedrock throughout the landscape plus the abundance of beaver (*Castor canadensis*) activity facilitated the creation of numerous bogs, fens, open-water ponds and shallow marshes. Flowing streams were present inland, however

more so in closer proximity to the outlets to the main watercourses bordering the HIWEC study area. Inland watercourses and wetlands within the HIWEC study area are tributaries to one of the following: the Key River which runs along the northern boundary of the HIWEC study area, Henvey Inlet, or the eastern shoreline of Georgian Bay.

4.1.4.2.2 Drainage

Surface drainage of inland waters within the HIWEC study area is generally directed northwest to the Key River and Henvey Inlet, and westward towards Georgian Bay. Surface water features where local drainage is conveyed to are common across the site given the complex topography of the site and its rocky nature. Elevation ranges from approximately 230 mASL in the east section of the HIWEC study area to approximately 170 mASL at the most westerly portion of the HIWEC study area near Georgian Bay. Based on correspondence and data provided by Tulloch Environmental, the water quality observed at a significant portion of the inland waterbodies was found to have lower than average dissolved oxygen and pH readings. This is commonly observed in bog and fen-type environments.

4.1.4.3 Fish and Fish Habitat

4.1.4.3.1 Aquatic Vegetation

During the summer of 2013, Tulloch Environmental conducted fish habitat assessment surveys at 40 site locations throughout the HIWEC study area, of which 36 sites were sampled for fish. Raw data provided by Tulloch Environmental and discussions with Tulloch biologists, local residents and direct observation has provided general insight on the dominant aquatic vegetation communities observed at these sites (i.e., submergent, emergent or floating), the total percent of aquatic vegetation cover and habitat types within the HIWEC study area. Information from these sources indicates that many of these site locations were considered natural wetland habitats (i.e., fen) or areas that had converted to wetlands due to beaver activity. The dominant vegetation type observed at the bog and fen habitats was floating mats, with species typical of these low pH habitat such as sweet gale (*Myrica gale*), bog rosemary (*Andromeda polifolia*), sheep laurel (*Kalmia angustifolia*), bog laurel (*Kalmia polifolia*), tamarack, and pitcher plant (*Sarracenia purpurea*).

Ponds of open water with bedrock shorelines and bedrock-boulder substrates with a significant component of detritus and muck were frequently observed throughout the HIWEC study area, such as the mixed wetland at the Key River. Emergent, submergent and floating aquatic vegetation typical of these habitat were commonly observed, such as Pondlily (*Nuphar variegate*), Pondweeds (*Potamogeton sp.*), Bladderwort (*Utricularia sp.*), cattails (*Typha sp.*) and Milfoil (*Myriophyllum sp.*). The wetland drains in a northerly direction for about 150 m and descends fairly steeply before it drains into the Key River.

These observations which are based on preliminary field work and background searches will be confirmed and supplemented following habitat field assessments, scheduled for spring and summer 2015.

The southern edge of Straight Lake consists of emergent and submergent aquatic vegetation. Barren sand substrate dominates the central portion and continues for two-thirds of the lake with depths up to 4.5 m. Submergent vegetation begins to appear at about 130 m from the south shore of the lake. As the north shore is approached, the submergent and emergent vegetation is present.

4.1.4.3.2 Fish and Fish Habitat

A variety of aquatic habitats throughout the inland waterbodies, bordering rivers (Key River and Henvey Inlet) and coastal shorelines were present throughout the HIWEC study area, able to support warm, cool and coldwater fish communities.



The Henvey Inlet watercourse is classified as cold water fish habitat until approximately 5 km west of Highway 69 where the thermal regime is unknown (Neegan Burnside Ltd. Preliminary Report (2011)). As a tributary to Georgian Bay, Henvey Inlet has the potential to support numerous fish species. Table 4-4 is a compilation of fish known to inhabit Henvey Inlet. This information is collected from data provided in the Neegan Burnside Ltd. Preliminary Report (2011) and direct observation.

Common Name	Scientific Name		Common Name	Scientific Name
Alewife	Alosa pseudoharengus		Northern Pike	Esox lucius
Lake Trout	Salvelinus namaycush		Muskellunge	Esox masquinongy
Lake Whitefish	Coregonus clupeaformis		Channel Catfish	Ictalurus punctatus
Cisco	Coregonus artedi		Rock Bass	Ambloplites rupestris
Smallmouth Bass	Micropterus dolomieu		Largemouth Bass	Micropterus salmoides
Black Crappie	Pomoxis nigromaculatus		Yellow Perch	Perca flavescens
Walleye	Sander vitreus]	White Bass	Morone chrysops

Table 4-4. Fish Likely or Known to Inhabit Henvey Inlet

The Neegan Burnside Ltd. Preliminary Report (2011) also identified known Walleye and Northern Pike spawning habitat in Henvey Inlet. Coarse substrates (boulder / cobble) aerated by circulating water preferred by Walleye (Scott and Crossman, 1985) and narrow emergent vegetation in sheltered bays with clear water preferred by Northern Pike (Scott and Crossman, 1985) were noted using air photo imagery and general field observations. Suitable spawning habitat for these fish, especially Northern Pike, was also observed in the Key River using air photo and direct observation.

Limited data was available regarding the fish community and fish habitat inland. Raw fish collection data was provided by Tulloch Environmental. The following species (Table 4-5) were observed during field investigations conducted by Tulloch Environmental in 2013.

Table 4-5	Fish Community	of Inland Wa	aterbodies	and Tributary	v Outlets to Henve	v Inlet and Key	v River
			aterboures,	and moutar	y outlets to henve	y milet and ric	y INIVEL

Common Name	Scientific Name
Northern Redbelly Dace	Chrosomus neogaeus
Central Mudminnow	Umbra limi
Common Shiner	Luxilus cornutus
Sand Shiner	Notropis stramineus
Brook Stickleback	Culaea inconstans
Pumpkinseed	Lepomis gibbosus
Iowa Darter	Etheostoma exile

Common Name	Scientific Name
Finescale Dace	Chrosomus eos
Brown Bullhead	Ameiurus nebulosus
Golden Shiner	Notemigonus crysoleucas
Fathead Minnow	Pimephales promelas
Rock Bass	Ambloplites rupestris
Black Crappie	Pomoxis nigromaculatus

Species at Risk 4.1.5

Species protected under the federal Species at Risk Act, 2002 (SARA) and provincial Endangered Species Act, 2007 (ESA) are addressed in the following sections.

4.1.5.1 Federal

Species listed as Endangered or Threatened under Schedule 1 of the SARA are protected on HIFN I.R. #2 and may require permits and / or authorization administered by Environment Canada - Canadian Wildlife Services (EC-CWS) if the proposed HIWEC activities are likely to contravene the general or critical habitat prohibition provisions (to be determined in consultation with EC-CWS). A total of 16 federally protected species, including five (5)

Endangered species and 11 Threatened, were identified as occurring or having the potential to occur within the HIWEC study area based on the background review (**Table 4-6**). Of these, ten (10) species were recorded within the HIWEC study area either by LGL or Stantec in 2011 and 2013, respectively.

Although Branched Bartonia (*Bartonia paniculata*) is identified in the MNRF Species at Risk list for Parry Sound (MNRF, 2014c), this species is only known from ten (10) sites in Ontario within the Muskoka and Parry Sound Districts, which are located more than 50 km away from the HIWEC study area. This species is considered unlikely to be present in the HIWEC study area and is not included in **Table 4-6**.

Although no records of Least Bittern (*Ixobrychus exilis*; listed under Schedule 1 of *SARA* as Threatened) and Tricoloured Bat (*Perimyotis subflavus*; listed under Schedule 1 of *SARA* as Endangered) were identified within the HIWEC study area through the background review, given their geographic ranges it is possible that these species and their habitats could be present within the HIWEC study area. Therefore, both of these species were considered to have the potential to occur in the HIWEC study area and included in **Table 4-6**.

Common Name	Scientific Name	S-rank ¹	ESA Status ²	COSEWIC Status ³	SARA Status⁴	Observed in 2011	Observed in 2013
Amphibian Species (1)							
Western Chorus Frog (Great Lakes / St. Lawrence – Canadian Shield Population)	Pseudacris triseriata pop. 1	S3	NAR	THR	THR (Schedule 1)	Yes	Possibly but not confirmed
Bird Species (6)							
Canada Warbler	Cardellina pusilla	S4	SC	THR	THR (Schedule 1)	Yes	Yes
Common Nighthawk	Chordeiles minor	S4	SC	THR	THR (Schedule 1)	Yes	Yes
Golden-winged Warbler	Vermivora chrysoptera	S4	SC	THR	THR (Schedule 1)	No	No
Least Bittern	Ixobrychus exilis	S4	THR	THR	THR (Schedule 1)	No	No
Olive-sided Flycatcher	Contopus borealis	S4	SC	THR	THR (Schedule 1)	Yes	Yes
Whip-poor-will	Caprimulgus vociferus	S4	THR	THR	THR (Schedule 1)	Yes	Yes
Mammal Species (3)							
Little Brown Bat	Myotis lucifugus	S4	END	END	END (Schedule 1)	No	No
Northern Myotis Bat	Myotis septentrionalis	S4	END	END	END (Schedule 1)	No	No
Tri-coloured Bat	Perimyotis subflavus	S3?	END	END	END (Schedule 1)	No	No
Reptile Species (6)							
Blanding's Turtle	Emydoidea blandingii	S3	THR	THR	THR (Schedule 1)	Yes	Yes
Eastern Foxsnake (Georgian Bay population)	Pantherophis gloydi pop. 1	S3	THR	END	END (Schedule 1)	Yes	Yes
Eastern Hog-nosed Snake	Heterodon platirhinos	S3	THR	THR	THR (Schedule 1)	No	No
Eastern Musk Turtle	Sternotherus odoratus	S3	SC	SC°	THR (Schedule 1)	Yes	No
Massasauga Rattlesnake (Great Lakes / St. Lawrence population)	Sistrurus catenatus pop. 1	S3	THR	Non-Active	THR (Schedule 1)	Yes	Yes
Spotted Turtle	Clemmys guttata	S3	END	END	END (Schedule 1)	Yes	Yes

Table 4-6. Federal Terrestrial Species at Risk Potentially Occurring in the HIWEC Study Area

Notes 1, 2, 3, 4, 5: See Notes at the end of Section 4.1

The presence of these federally protected species and their habitats was confirmed during the field studies completed in the spring and summer of 2015.

No federally protected aquatic species were identified within the HIWEC study area.

4.1.5.2 Provincial

Species listed as Endangered or Threatened under the provincial *ESA* but not listed under Schedule 1 of *SARA* are treated as provincially protected species for the purpose of this Interim Draft EA Report. **Table 4-7** lists the provincially protected terrestrial species that was identified as occurring or having the potential to occur within the HIWEC study area through the background review. This species was not recorded during previous field studies completed by LGL and Stantec in 2011 and 2013, respectively.

Table 4-7. Provincial Terrestrial Species at Risk Potentially Occurring in the HIWEC Study Area

Common Name	Scientific Name	S-rank ¹	ESA Status ²	COSEWIC Status ³	SARA Status ⁴	Observed in 2011	Observed in 2013
Bird Species (1)							
Barn Swallow	Hirundo rustica	S4	THR	THR	No Status (No Schedule)	No	No

Notes 1, 2, 3, 4 See Notes at the end of Section 4.1

Barn Swallow (*Hirundo rustica*) was not observed by LGL or Stantec in the HIWEC study area and is a provincially listed species. Barn Swallows nests in man-made structures such as barns, other buildings, houses, bridges and road culverts (COSEWIC, 2011). With the exception of a small residential section located immediately west of Highway 69 on Bekanon Road, a few private cottages located on the north side of Henvey Inlet and a few cabins, the majority of the HIWEC study area is undeveloped. However, this species can also nest on cliffs which may be present within the HIWEC study area. The presence of this provincially protected species and its habitat was confirmed during the field studies completed in the spring and summer of 2015.

Although Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) are identified in the MNRF Species at Risk list for Parry Sound (MNRF, 2014c), these species were not observed by LGL or Stantec and are considered unlikely to occur in the HIWEC study area, which does not contain any large open grassy fields, meadows or agricultural lands that could support suitable breeding habitat for these species (MNRF, 2014c). These species are considered unlikely to be present in the HIWEC study area and are not included in **Table 4-7**.

Golden Eagle (*Aquila chrysaetos*) was observed by Stantec in 2013 in the HIWEC study area. However, the species was likely just flying over, which does not indicate evidence of breeding in the area. Furthermore, the HIWEC study area is located outside of the breeding range for this species (Cadman, *et al.* 2007) and therefore the individual that was observed was likely only a non-breeding migrant. This species is considered unlikely to be present in the HIWEC study area and is not included in **Table 4-7**.

Several resources were consulted to identify any aquatic SAR which may occur within the HIWEC study area, such as the MNRF NHIC Make-a-map web application (MNRF 2015) and the MNRF Species at Risk web site (MNRF 2015), which were used to search for SAR records within any of the 1 km UTM squares that surrounded the HIWEC study area. The search resulted in one (1) provincially protected aquatic species, Lake Sturgeon (*Acipenser fulvescens*), which is currently designated as Threatened under the *ESA*. This species is also considered Rare under the SOCC, and the Great-Lakes / St. Lawrence population of Lake Sturgeon is under consideration for listing federally with the SARA, as summarized in **Table 4-8** below.

As Lake Sturgeon are listed as Threatened under the *ESA*, provisions for the protection of this species are determined in consultation with MNRF on lands within provincial jurisdiction. Since Lake Sturgeon is not listed under Schedule 1 of the SARA, there are no federal permitting requirements for the species.

Table 4-8. Provincial Aquatic Species at Risk Potentially Occurring within the HIWEC Study Area

Taxon	Common Name	Scientific Name	S-Rank ¹	ESA Status ²	COSEWIC Status ³	SARA Schedule ⁴	Year Last Observed
Fish	Lake Sturgeon (Great Lakes - Upper St. Lawrence River	Acipenser fulvescens	S2	THR	THR	Under Consideration	1990s

Notes 1, 2, 3, 4 See Notes at the end of Section 4.1

Notes for Tables 4-6-4-8

¹S-rank: The Natural Heritage provincial ranking system (provincial S-rank) is used by the MNRF Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. Definitions are as follows:

- S1 Extremely rare in Ontario; usually five (5) or fewer occurrences in the province or very few remaining individuals; often especially vulnerable to extirpation.
- S2 Very rare in Ontario; usually between five (5) and 20 occurrences in the province or with many individuals in fewer occurrences; often susceptible to extirpation.
- S3 Rare to uncommon in Ontario; usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances. Most species with an S3 rank are assigned to the watch list, unless they have a relatively high global rank.
- S4 Common and apparently secure in Ontario; usually with more than 100 occurrences in the province.
- S5 Very common and demonstrably secure in Ontario.
- SH Possibly Extirpated (Historical). Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years.
- S#S# A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community.
- S#? Rank uncertain.

² ESA Status: The Endangered Species Act 2007 (ESA) protects species listed as Threatened and Endangered on the Species at Risk in Ontario (SARO) List on provincial and private land. The Minister lists species on the SARO list based on recommendations from the Committee on the Status of Species at Risk in Ontario (COSSARO), which evaluates the conservation status of species occurring in Ontario. The following are the categories of at risk:

- END (Endangered) A species facing imminent extinction or extirpation in Ontario.
 - **THR** (Threatened) Any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a significant portion of its Ontario range if the limiting factors are not reversed.
- SC (Special Concern) A species that may become threatened or endangered due to a combination of biological characteristics and identified threats.
- NAR (Not at Risk) A species that has been evaluated and found to be not at risk.
- ³COSEWIC Status: Committee on the Status of Endangered Wildlife in Canada (COSEWIC) evaluates a federal status ranking for all species that it assesses. Rankings include the following:
 - END (Endangered) A species facing imminent extirpation or extinction throughout its range.
 - **THR** (Threatened) A species likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction
 - SC (Special Concern) A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events, but does not include an extirpated, endangered or threatened species.
 - NAR (Not at Risk) A species that has been evaluated and found to be not at risk.

⁴SARA Status: The Species at Risk Act (SARA) protects Species at Risk designated as Endangered, Threatened and Extirpated listed under Schedule 1, including their habitats on federal land. Schedule 1 of SARA is the official list of wildlife species at risk in Canada and includes species listed as Extirpated, Endangered, Threatened and of Special Concern. Once a species is listed on Schedule 1, they receive protection and recovery measures that are required to be developed and implemented under SARA. Species that were designated at risk by COSEWIC before SARA need to be reassessed based on the new criteria of the Act before they can be listed under Schedule 1. These species that are waiting to be listed under Schedule 1 do not receive official protection under SARA. Once the species on other schedules (2 and 3) have been reassessed, the other schedules are eliminated and the species is either listed under Schedule 1 or is not listed under the Act.

The following are definitions of the SARA status rankings assigned to each species.

END (Schedule 1) – These species are listed as Endangered under Schedule 1 of SARA and receive species and habitat protection under SARA, as well as recovery strategies and action plans.



THR (Schedule 1) – These species are listed as Threatened under Schedule 1 of SARA and receive species and habitat protection under SARA, as well as recovery strategies and action plans.

SC (Schedule 1) – These species are listed as Special Concern under Schedule 1 of SARA and receive management initiatives under SARA to prevent them from becoming endangered and threatened.

No Status (No schedule) – These species are evaluated and designated by COSEWIC but are not listed under Schedule 1 and therefore do not receive protection under SARA.

NAR (Not at Risk)– These species have either been assessed by COSEWIC as Not at Risk or there is not enough sufficient data to assess the status ranking of the species and therefore these are not listed on Schedule 1 nor do they receive protection under SARA.

Not Applicable (N/A) – These species have either been assessed by COSEWIC as Not at Risk or there is not enough sufficient data to assess the status ranking of the species and therefore these are not listed on Schedule 1 nor do they receive protection under SARA.

Source: Government of Canada, 2009: Frequently Asked Questions: What are the SARA schedules? Accessed on February 2015. Available: http://www.dfo-mpo.gc.ca/species-especes/faq/faq-eng.htm

⁵ Eastern Musk Turtle has been recently down listed from Threatened to Special Concern by COSEWIC but this change has not yet been updated under Schedule 1 of SARA. Therefore this species designation as Threatened under Schedule 1 of SARA may change in the future.

4.2 Socio-Economic Environment

Existing socio-economic conditions were gathered through desktop research using secondary sources such as existing GIS data, as well as from community, municipal and government websites. Sources used include the HIFN website, published statistics from Statistics Canada and Aboriginal Affairs and Northern Development Canada (AANDC), treaty and land claims information from the Aboriginal Treaty Information Research System (ATRIS), and previously asserted interests on other projects such as the Highway 69 expansion. Aboriginal traditional knowledge pertaining to HIFN Reserve lands was also considered as part of the research. Existing socio-economic features provide a baseline from which HIWEC related effects can be assessed.

The socio-economic environment consists of features deemed important to the day-to-day function of the community and that bolster community well-being and cohesion. These include aspects such as community population and economic conditions, as well as the structures and institutions that are integral to community function. Other aspects such as land use and areas important for cultural heritage or archaeological importance are also included as they relate to the community's character.

For the purposes of the socio-economic existing conditions study, the HIWEC regional study area was reviewed, which includes the adjacent Municipality of Killarney and geographic municipalities of Henvey Township and Mowat Township, where applicable. Henvey Township and Mowat Township are two unincorporated townships that are part of the Parry Sound District which do not have local level governance or any local service boards that provide typical municipal services. The socio-economic features identified through background review are described throughout subsequent sections and are shown in **Figure 4-7**.

4.2.1 Henvey Inlet First Nation Overview

HIFN is an Anishinabek community located between Parry Sound and Sudbury, with the main village located one kilometer from Highway 69 near Grundy Lake Provincial Park. The community has both on- and off-Reserve members and includes two reserves, French River Reserve No. 13 which includes Cantin Island, while the other reserve is HIFIN I.R. #2, the proposed site of the HIWEC. **Figure 2-1** illustrates the location of the HIFN Reserves. The location and characteristics of the Reserves are examined in subsequent sections.

4.2.1.1 Pre- Contact History

The history of HIFN is tied to its geographic location at Henvey Inlet, and its proximity to the French and Pickerel Rivers. The rivers have been used by HIFN members for fishing, hunting, trade, and logging (HIFN, 2015a).



Date Saved: 6/18/.

Although often referred to by settlers as "Ojibway", today many in the community prefer to be referred to as Anishinabek, a term meaning "First People." The Anishinabek people inhabited the region in which Henvey Inlet is situated prior to European arrival. When the Anishinabek people first encountered European explorers and fur traders, there were many similar, but politically autonomous groups in what is now Ontario. Many of the Bands or Tribes were given different names despite sharing many common linguistic and cultural similarities. Some examples of these names are: Algonquin, Ojibway, Odawa, Chippewa and Mississauga.

Today, the concept of an Anishinabek Nation now links speakers of the Ojibway language. The Odawa (or Ottawa), occupied much of the north shore of Gregorian Bay and Manitoulin Island and Bruce Peninsula, where they bordered with the Huron and Petun (McMillan and Yellowhorn, 2004). Their role as intermediaries in the trade with these Iroquoian groups gave rise to calling them 'traders'. The Algonquian inhabited the Ottawa Valley and adjacent regions in the early contact period. They are all collectively referred to as Anishinabek because linguists determined they all speak the same language in different dialects (McMillan and Yellowhorn, 2004; Schmalz, 1991). Henvey Inlet First Nation and many of its neighbouring First Nations consider themselves Anishinabek people.

4.2.1.2 Contact-Period History

The HIWEC study area was first explored by Europeans in the early 1600s, who travelled the French River into Georgian Bay from the Ottawa River. This led to the development of fur trade posts in the area. During the period between 1670 and 1713, French traders began to leave established settlements and construct trading posts that enabled traders to make direct contact with the people living in the interior. The Nipissings, Odawa and other Anishinabek groups in Northern Canada were referred to as the 'middlemen' of the trade all the way north to James Bay (Hunt 1940: 35, 45; Pollock 1999). An examination of the Atlas of Canada's map "Posts of the Canadian Fur Trade, 1600-1870" indicates the presence of three Fur Trade Posts in close proximity to HIFN I.R. #2. The Hudson's Bay Co. (HBC) had a post at the mouth of the French River, and one south of the HIWEC study area called Shawinaga, near Pointe au Baril. There were also multiple Independent Canadian posts in the surrounding area, but a large number of them were located around Lake Nipissing to the northeast. The map is included in the Stage 1 Archaeology Report.

Competition for resources between French and English led to alliances, such as the French-Huron alliance which began in 1615. The northern coasts of Georgian Bay and Lake Huron may have served as a transition zone or buffer between the Anishinabek and Iroquois, as it was sparsely occupied until the return of the Ojibway (Anishinabek) along the Georgian Bay and Lake Huron in the 1700s (Pollock, 1999). By the early 1800s, securing mining and other resources became increasingly important, and a driving force for Upper Canada to begin looking to northern territories. The treaty making process for the Robinson Huron Treaty of 1850 was established during this period which established reserves of land for many Anishinabek communities. Two of the reserves under this treaty would become HIFN Reserves (HIFN I.R. #2 and French River Reserve No. 13). These Reserves are explained in **Section 4.2.1.3.1**.

Initial surveys in the area consisted of efforts confined to canoe through rivers and water ways. The area remained relatively untouched by European development until the Muskoka and Parry Sound Districts were surveyed between 1866 and 1870 (Campbell, 2005). Despite the surveyors reporting that the land was unfit for farming, the wealth in timber was deemed highly profitable. Communities on Georgian Bay, i.e., Killarney, Byng Inlet / Britt, Parry Sound, developed not as service centres for surrounding farmland, which was the case in Southern Ontario, but as isolated ports, railway stops, or company mill towns (Campbell, 2005).

The Northern and Pacific Junction Railway became part of the Grand Trunk railroad system which opened up Parry Sound and Muskoka's isolation. The railway was constructed in the 1880s to connect the railways of Southern Ontario to the new transcontinental line of the Canadian Pacific Railway. Communities like Britt and Key Harbour survived as railway ports to unload coal and oil off tankers that were coming from Lake Superior and Lake Huron (Campbell, 2005). Key Harbour's location near HIFN I.R. #2 may have made the area surrounding the harbour important for local transportation and timber extraction. Some historic port infrastructure remains in the form of pier pilings at Key Harbour and a coal storage structure adjacent to the old pier.

The area near French River Reserve No. 13 experienced more growth compared to HIFN I.R #2 during this period due to its location near the French River. This river was part of a key water transportation route from the St. Lawrence River to the Great Lakes via the French River and Ottawa River systems from 1600 to the mid-1800s. The area prospered within the fur trade, as well as commercial logging and fishing. The French River Village was originally developed in the late 1880s as a result of the extensive logging industry. Timber cutting, logging and lumber mills sprang up in the area in 1873 until the 1930 depression era. Population declined steadily during the depression years, but the area was never totally abandoned. Today it continues to support a small population and enjoys a summer boom. A few original structures still remain from the period, along with extensive foundations from the mill (HIFN, n.d.). In the early 1960s, the Ontario Government closed the area for further development making it part of the North Georgian Bay Recreation Reserve. The French River was designated Canada's first Heritage River in 1986.

4.2.1.3 Treaties and Reserves

4.2.1.3.1 Robinson Huron Treaty (1850)

The first treaty signed within this region was the Robinson Huron Treaty, a treaty signed between Crown representatives and the communities living along northern Georgian Bay and the North Shore of Lake Huron. The 1850 Robinson Huron Treaty was different from others negotiated in the southern portion of the Province in that the Crown promised the creation of reserves, annuities, and the continued right to hunt and fish on unoccupied lands. The boundaries of the treaty extended from the lake shore between the Sault Ste. Marie area and the southern end of Georgian Bay to the height of land, an ill-defined area inland that extended to the limits of the lake's watershed (AANDC, 2013).

HIFN is a signatory of the Robinson Huron Treaty. The community derives from two bands that sent representatives to the Robinson Huron treaty signing, namely Chief Louis Mishequanga's band at French River Reserve No. 13 and Chief Wagamake's band at the mouth of Henvey Inlet on Georgian Bay (HIFN I.R. #2), both of which amalgamated in 1923 to become HIFN.

The HIWEC study area has been inhabited since at least 1851, when the first surveyor mapped HIFN I.R. #2 following the signing of the Robinson Huron treaty. The surveyor met Chief Wagamake "at their village for the purposes of pointing out the limits of their Reserve" (Dennis 1891: diary and field notes, vol. 1). The Band had chosen to reserve this location because of the valuable fisheries, the location of a village on the south shore of the Inlet, as well as a cornfield, and a sugar bush on the portage between the Key River and Henvey Inlet (Pollock, 1999). A 2010 report on the village identified its name as "Nekickshegeshing," or "Day of the Place of the Otter," Elders in the community believe the name was likely in reference to the Otter clan within HIFN, as well as the village's role as a favourite stopping place on the traditional long distance cance route between southern Georgian Bay and Lake Nipissing (Allen, 2010).

In 1852 the lands were agreed upon by Chief Wagamake, Dennis and J. William Keating, a former Assistant Indian Superintendent. Dennis also surveyed the Lower French River Reserve, now known as French River Reserve No. 13, in May of 1853.

HIFN traditional knowledge recounts the presence of another later village on the Key River that existed in the late 1800s. A smaller number of band members lived on the Reserve near Bekanon Road. Many members of the Key River settlement moved to the French River Reserve No. 13 between the 1940s and 1950s while the current village site was developed.

The two reserves provided to HIFN are shown in **Figure 2-1** and are described as follows:

- HIFN I.R. #2 is located on the North East shore of Georgian Bay, approximately 90 km south of Sudbury on the west side of Highway 69 and 71 km north of Parry Sound, at approximately 40 degrees 50' North latitude and 80 degrees 40' west longitude. The Reserve size is approximately 9,233 ha.
- French River Reserve No. 13, which is located 11 km north of the HIFIN I.R. #2, is east of Highway 69 on Pickerel River, and approximately 45 degrees 58' North latitude and 80 degrees 30' West longitude. French River Reserve No. 13 is the location for the community's main village. This village is located on Pickerel River Road. The community notes that Cantin Island is part of this Reserve, and the island is located north of the mainland portion and separated by the Pickerel River and the French River on the north side. The Reserve size is 2,544.60 ha (Aboriginal Affairs and Northern Development Canada (AANDC), 2015a).

4.2.1.3.2 Land Claims

HIFN has two specific claims (those pertaining to specific asserted infringements):

Claim	Status	Potential Relevance
James Bay Railway	In Negotiations. Claimant agreed to	Yes. This claim refers to HIFN I.R. #2, the location of the HIWEC, although all
Alleged illegal appropriation of land from the HIFN I.R. #2.		rail lines in the vicinity are to the east of the HIWEC.
Treaty Rights	Concluded	No. This claim is concluded.
Chiefs of the Robinson Huron treaty area asked that their treaty dated 1850 be renegotiated alleging that the		
Crown failed to meet certain commitments under the treaty		
First Nation land, hunt/fish rights.		

Source: AANDC, 2015b.

HIFN has the following comprehensive claim (claims pertaining to broader themes such as representation):

Claim	Status	Potential Relevance
Self-Government Negotiations	Accepted for negotiations.	Potential. This is a general claim that may have some relevance for the
Anishinabek Nation (Union of Ontario Indians)		management of Crown lands in this region, although no agreement has
		been reached.

Source: AANDC, 2015b.

4.2.2 Other Aboriginal Interests

The HIWEC is proposed entirely on HIFN I.R. #2 and, as such, no other Aboriginal interests are anticipated. Off-Reserve areas may be subject to other Aboriginal interests based on their traditional territories and any potential impacts to other Aboriginal interests will be discussed in **Volume B** of the Final Draft EA Report.

4.2.2.1 Métis Interests

The Métis are an Aboriginal people as enshrined by the Canadian *Constitution Act, 1982* and as such have Aboriginal rights. Métis interests are best confirmed through engagement with the Métis Nation of Ontario (MNO) Lands and Consultation Unit. The formal process for Métis consultation requires that the MNO Lands and Consultation Unit be the first contact for engaging with individual Métis community councils in Ontario.

The closest Métis community councils are located in Sudbury, North Bay and Mattawa:

- MNO Sudbury Métis Council www.sudburymetiscouncil.org
- MNO North Bay Métis Council www.northbaymetiscouncil.ca
- MNO Mattawa Métis Council no website is available

The Métis are the descendants of mixed European and Aboriginal ancestry that, over time, developed into a unique culture within Canada. Métis culture has many ties to the early fur trading practiced by French (as well as some English and Scottish) traders which were some of the first visitors to the interior of North America.

French fur traders are known to have used the French River and related watershed to transport furs and explore the area between the Ottawa River and Georgian Bay. The proximity of this trade route may suggest that Métis Councils could have Aboriginal interests pertaining to areas within the region surrounding the HIWEC.

The Métis Nation of Ontario has a harvesting agreement with the Ministry of Natural Resources and Forestry, outlined in a 2004 MNO-MNRF Harvesting Agreement. The Métis Nation of Ontario 2011 Harvesting Policy based on this agreement allows for Métis citizens to harvest for personal use items on Crown Land such as plants, fish, wildlife and firewood gathered for heating, food, medicinal, social or ceremonial purposes (Métis Nation of Ontario, 2011). The Métis Nation of Ontario identifies that the Georgian Bay coastal areas are part of the Georgian Bay Traditional Harvesting Territory (Métis Nation of Ontario, 2015).

4.2.2.2 Williams Treaties (1923)

The HIWEC study area also falls within the limits of the Williams Treaty signed in 1923, although HIFN is not a signatory. The Williams Treaties (1923) sought to rectify a situation where Chippewa and Mississauga communities to the south were not included in the Robinson Huron treaty process, and to create a treaty for areas south of the French River pertaining to these communities. Signatories of the treaty include the Chippewas of Lake Simcoe, Lake Huron and the Mississaugas of Rice Lake, Scugog, Curve Lake and Alderville in central Ontario. These communities are now the following:

- Alderville First Nation;
- Curve Lake First Nation;
- Hiawatha First Nation (Mississaugas of Rice Lake);
- Mississaugas of Scugog Island First Nation;
- Chippewas of Rama First Nation;
- Chippewas of Georgina Island First Nation; and
- Beausoleil First Nation.

The Robinson Huron Treaty and Williams Treaties appear to overlap, and the applicability of these treaties and associated rights will be determined in discussions with the Crown. The map in **Figure 4-8** identifies the Williams Treaties area as well as the Robinson Huron Treaty area. Note that some signatories such as HIFN are signatories of the Robinson Huron Treaty shown as a green diamond symbol in **Figure 4-8**.

Figure 4-8: Pre-1975 Treaties in Ontario

Source: AANDC, 2014.

4.2.3 Land and Resources Used for Traditional Purposes by Aboriginal Persons

4.2.3.1 Traditional Land Use

HIFN includes a creation story on its website, as told by Darlene Johnson, an Anishinabkwe (alternate spelling) professor for the University of Toronto. The story identifies how the earth came to be, as well as the importance of animals such as the hare, beaver, otter, muskrat, and fox as part of the Anishinabek world view (HIFN, 2015c).

Anishinabek subsistence was based on the annual round of hunting, fishing and plant collecting. The winter was devoted to the pursuit of moose, deer, bear and other large game. In spring, families would return from their hunting camps to rejoin others at their major fishing sites. Pickerel, pike and suckers could be caught throughout the summer, and autumn spawning brought whitefish, trout and sturgeon close to shore. The Anishinabek netted or speared large quantities of fish, and the fisheries became centres of community life and cultural interaction. From writings of the Jesuits, it was documented during the mid-17th century that up to 2,000 individuals might converge at the rapids of Sault Ste. Marie (McMillan and Yellowhorn, 2004). Plant foods have always played an important role in Anishinabek economy; maples were tapped, berries collected, and wild rice harvested from the shallow waters of nearby lakes. In order to transport food stuffs and travel between different resource areas Anishinabek people utilized birch bark canoes. These canoes were tough, but lightweight, which allowed for easy portage between waterways (McMillan and Yellowhorn, 2004).

Living quarters consisted of dome-shaped structures, referred to by the Algonquin term, wigwams. Sheets of birchbark covered the structure, layered in a way to allow for moss in between acting as insulation. Conical or tipishaped structures were also not uncommon (McMillan and Yellowhorn, 2004; Schmalz, 1991). Hides were utilized for clothing, stitched together using sinew. Social interaction was essential to the survival of the peoples, in which activities included feasting, dancing, lacrosse and gambling with bone dice. Storytelling was at the heart of many social gatherings. Rich oral traditions consisted of Anishinabek mythology designed to both entertain and instruct, filled with powerful supernatural humans and animals (McMillan and Yellowhorn, 2004). Every animal, bird, plant, or inanimate object had a power that could either help or hinder humans. The Anishinabek were widely respected for their shamanic abilities to cure illness, see spirits at work, and provide blessings for numerous activities.

HIFN prepared the *Traditional Land Use Study Related to Proposed Four Lane Highway 69* in 2013. Community members and groups were interviewed to provide information on historic and current land uses within the community's traditional territory.

Due to the confidential nature of sensitive community information, a general summary is provided without identifying specific locations.

- **Food Sources:** The community traditional land use study covered topics including hunting, fishing, trapping, gathering as well as cultural practices, all of which occur within its traditional territory.
 - The community historically consumed much more fish than large game as fishing was far easier than hunting larger game.
 - Gathering for food included various species of naturally occurring berries.
 - Squash and corn were planted as a food source.
- Animal behaviours: Members identified locations on-Reserve that are particularly important for their traditional way of life, including fish spawning areas and deer crossing locations.
- **Gathering (Ceremonial):** Items gathered for their cultural and spiritual value includes types of bark and plants added to teas or as part of smudging ceremonies. Sweet grass is of particular importance to the community.
- **Settlements:** The site of a historic village for the community was identified within Reserve lands, as well as former cabin and camp locations. These locations are typically associated with rivers and waterbodies that cross the community's traditional territory. Inland areas were not used for settlements, but rather were for hunting, trapping, gathering traditional medicines, and making syrup.
- **Sacred locations:** These refer to areas such as grave sites. These areas are particularly sensitive for community members. Many of these locations are not to be shared with individuals outside of the community.
 - The study identified burial locations, ceremonial locations (such as sweat lodges), and other sacred areas which should be avoided by development.
- **Travel routes**: These routes typically corresponded with access provided by rivers. These travel routes were identified as having economic, historical and cultural significance. Some built trails such as railway right of ways or other existing trails were also important to the community.
- Landmarks: The traditional land use study also mapped built infrastructure or features on the land such as former hotels or camps, beach sites, or local landmarks that are important for the community's sense of place.
- Species at Risk: The community has raised concerns about SAR, including the Blanding's Turtle.
- **Water:** Surface water and groundwater are important to the community. Water has important linkages to travel, drinking water, and cultural uses (HIFN, 2013).

The *Traditional Land Use Study Related to Proposed Four Lane Highway 69* provided to the assessment team is used internally, and in discussion with HIFN Chief and Council and the community, to avoid and/or mitigate potential impacts to sites where necessary. These areas will be considered as part of the EA, along with consultation with elders and other community members.

4.2.3.2 Anishinabek Current Land Use: On-Reserve

In 2006, HIFN became a signatory of the *First Nations Land Management Act*, and entered into a separate agreement in 2009 with the Minister of Indian Affairs and Northern Development (now AANDC). The community now has the authority to enact laws respecting environmental assessment and environmental protection on-Reserve. The community has enacted an environmental law covering the EA process under which the HIWEC will be reviewed.

HIFN's Land Code govern current land usage within the community, including the lands proposed to be used for the HIWEC. Lands selected for use for the HIWEC are based on knowledge gathered within the community, supported by environmental and technical siting studies to minimize effects on the land and can feasibly be constructed.

As part of the Robinson Huron treaty, community members have maintained their Aboriginal rights to hunt, fish and continue their traditional land uses, both on-Reserve as well as off-Reserve. These traditional land uses continue to the present day, and the Land Code seeks to protect ongoing opportunities to perform these functions.

The Union of Ontario Indians (the Anishinabek Nation) has a Trapping Harmonization agreement with the Federal and Provincial government in which it allows the organization to manage Aboriginal trapping activities on-Reserve (Anishinabek Nation, 2015).

4.2.3.3 Regional Anishinabek Natural Environment Interests

An analysis of regional projects provides additional insight into the interests of HIFN and regional First Nations regarding land use.

HIFN has been involved in negotiations with the MTO with respect to the widening of the Highway 69 corridor, which is intended to provide a 4 lane divided highway linking Sudbury and cities to the south including Parry Sound. These negotiations are ongoing.

Six communities, including HIFN were involved in the development of the French-Severn Forest Management Plan for the area between Georgian Bay and Algonquin Park (MNRF, 2009). The French-Severn Forest Management Plan was developed and is maintained by a non-profit organization, Westwind Forest Stewardship, who is the Sustainable Forest License holder (Ministry of Natural Resources / Westwind Forestry Management, 2009). The plan summarized the interests of First Nations in the area as tending towards Crown land when using land off-Reserve for hunting, fishing, gathering and spiritual/cultural practices. Some communities are interested in fisheries management and watersheds, renewable energy opportunities, economic development opportunities, interest in shared stewardship opportunities across the land base, and preserving Aboriginal cultural values.

The French-Severn Forest Management Plan also identified Aboriginal interests in the following areas:

• **Compensation:** issue most commonly articulated by Robinson-Huron Treaty signatory communities who feel strongly that Resource Benefit Agreements or revenue sharing (i.e. Crown dues) is a fundamental part of their treaty rights.

- Forest Harvesting: Many First Nations continue to express interest in easy access to timber harvests
 within close proximity to their communities for personal/communal use or commercial profit. There is
 growing interest in some communities in supporting emergent bio-energy opportunities through postharvest processing (i.e. chipping).
- **Forest Spraying:** Early and on-going communication throughout the Forest Management Plan's life cycle is very important to many communities. With respect to spray programs, First Nations may have site specific values / interests which need to be considered, or conversely may wish to participate in on-Reserve treatments at the same time as the nearby Crown forest.
- Access: With continued and growing pressures on access to resources by various third party interests, First Nations continue to be concerned that both physical access to Crown land and access to the resources themselves are threatened. In the case of Robinson-Huron treaty signatories, this is acutely expressed as a potential threat to their treaty rights.
- Values Protection: Perhaps the issue of greatest interest and discussion, but the most challenging as well, is the protection of community values. The protection of Aboriginal values throughout the planning cycle is of key import to First Nations, MNRF, Westwind and their partners, and the Planning Team as a whole. Continuing to foster and build strong, trusting relationships between all parties is key in protecting Aboriginal values across the Forest (Source: Ministry of Natural Resources and Westwind Forest Stewardship Inc. Forest Management Plan for the French/Severn Forest (360), Period April 1, 2009-March 31, 2019).

As discussed previously, HIFN is also a member of the Union of Ontario Indians (the Anishinabek Nation), a 39member First Nations political organization that advocates for member interests including lands and resources access. The group asserts aboriginal interests in water quality, trapping through an existing Trapping Harmonization Agreement with Federal and Provincial entities, aboriginal participation in the forestry and mining sectors, as well as ongoing negotiations regarding resource benefit sharing. Many of these interests are expected to be shared by HIFN given its membership in the organization (Anishinabek Nation, 2015).

4.2.4 Socio-Economic Features: On and Off-Reserve

The HIWEC study area is located on-Reserve, however there are a number of other socio-economic features within the immediate vicinity that provide services or have an influence on HIFN's existing conditions. **Table 4-9** identifies various socio-economic features identified through desktop research.

Name of Feature	Approximate Location	Type of Feature (School, Hospital, etc.)	Details
Forest Access Road	Intersects Highway 69 just South of HIFN I.R. #2	Access Road	Recreation access route, former logging route.
Railway Corridor	Parallel to Highway 69 through HIWEC study area	Rail Corridor	Two railway lines owned by Canadian Pacific Railway and Canadian National Railway respectively, used for freight purposes, intersect near the eastern extent of HIFN I.R. #2. The Canadian Pacific Railway line passes through the main community village on French River Reserve No.13.
Grundy Lake Provincial Park	Intersection of Highway 69 and Highway 522	Provincial Park	Located immediately south of French River Reserve No. 13. Source of visitors to the area.
French River Provincial Park	Located across from HIFN I.R. #2, at Key River	Provincial Park	Located immediately north of the HIFN I.R. #2. The park is a large waterway class park.

Table 4-9. Key Socio-Economic Features Near the HIWEC Study Area

Name of Feature	Approximate Location	Type of Feature (School, Hospital, etc.)	Details		
Key River Marina	Adjacent to Highway 69 north of HIFN I.R. #2 and the Key River	Marina, recreation	Canoe rentals and sales. Boat storage and repair. Access point for boats.		
Esso Station	Highway 69 north of HIFN I.R. #2 and Key River	Fuel and Convenience store	Gas Bar with Convenience Store		
Unnamed restaurant	Highway 69 north of HIFN I.R. #2 and Key River	Restaurant	Attached to Convenience store associated with the Esso station.		
Camp Dore	Highway 69 north of HIFN I.R. #2 and Key River	Overnight accommodation, marina, store, marine taxi	Boat launching, parking, dock slip rentals, indoor and outdoor winter boat storage, boat rentals, fishing store, marine Taxi service, 6 log cabins for rent, fuel for sale.		
Key Harbour Lodge	West of Highway 69 on the north side of the Key River where it meets Georgian Bay	Overnight accommodation, recreation	Dock slip, water sports, hunting and fishing, lodging, general store		

Table 4-9. Key Socio-Economic Features Near the HIWEC Study Area

There are additional socio-economic features related to cottage/residential areas along the Key River, situated along the northern boundary of the HIWEC study area. The area is popular for cottage-goers and water sports enthusiasts and also has a stopping point on Highway 69 which includes a gas station and marina located near the river crossing.

The Key River Area Association identifies approximately 100 seasonal and permanent residents in northeastern Georgian Bay. The intention of the group is to promote the interests of their members to government and other stakeholders and to maintain the peaceful nature of the community (Key River Area Association, 2015).

In the broader area, residential buildings are located in isolated areas along Highway 69 near the HIWEC study area.

4.2.5 Population and Economic Profile

4.2.5.1 Population

HIFN has members that live on-Reserve and off-Reserve. The population statistics provided by the community as shown in **Table 4-10** identify that most of HIFN's 600 community members currently live off-Reserve, with 150 residing within the community's Reserve lands.

Population Location	Number

Table 4-10.	Henvey Inlet First Nation Population Statisti	cs
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150

450

600

Source: HIFN, 2015d

On-Reserve

Off-Reserve

Total

AANDC identifies an on-Reserve population that is slightly higher at 165 in 2011 and 115 members in 2006 (AANDC, 2015b). Statistics Canada Census 2011 provides data specifically about HIFN I.R. #2 where the HIWEC will be located. The population given for HIFN I.R. #2 was 15 in 2006 and 28 in 2011 (Statistics Canada, 2011).

4.2.5.2 Employment and Labour Force Indicators

Table 4-11 shows the Labour Force Indicators for HIFN. Between 2006 and 2011 the participation rate and employment rate rose in relation to an improving unemployment rate of 18.8%. This rate, however, is higher than the Canadian National average in 2011, reported by Statistics Canada at 7.8%.

	2011			2006		
Labour Force indicators	Total	Male	Female	Total	Male	Female
Participation Rate	66.7	69.2	63.6	52.9	75.0	44.4
Employment Rate	50.0	53.8	54.5	41.2	50.0	22.2
Unemployment Rate	18.8	33.3	28.6	22.2	33.3	0.0

Table 4-11. Henvey Inlet First Nation Labour Force Indicators

Source: AANDC, 2015e

4.2.5.3 Occupations and Industries

Table 4-12 shows the Industry Characteristics for HIFN. Most individuals identified that their industry is "other services", while individuals also reported work within industries such as "Manufacturing and Construction," "Wholesale, Retail," and "Health and Education." Two categories ("Business Services" and "Transportation, Warehousing") were reported in 2006 but not in 2011, which may be related to a similar higher reporting of "Other Services" in 2011.

Table 4-12. Henvey Inlet First Nation Industry Characteristics

Inductor Indicatoro	2011			2006			
mustry mucators	Total	Male	Female	Total	Male	Female	
Population 15 years and over	120	65	55	85	45	40	
Agriculture, resource based	0	0	0	0	0	0	
Manufacturing, construction	10	10	0	10	10	0	
Wholesale, retail	10	0	0	10	0	0	
Finance, real estate	0	0	0	0	0	0	
Health, education	10	0	10	10	0	10	
Business services	0	0	0	10	0	0	
Transportation, warehousing	0	0	0	0	10	0	
Other services	40	20	20	25	10	10	

Source: AANDC, 2015e

Note: In some cases there is missing information, incorrect totals and rounded data. According to AANDC and Statistics Canada, procedures are applied to prevent the possibility of associating statistical data with any identifiable individual: the data are randomly rounded and they are suppressed for certain geographic areas (AANDC, 2015e).

Table 4-13 shows the Occupation Characteristics for HIFN. The 2006 occupation data is limited and may not have been reported to AANDC. The most common occupation classifications are "social science/government", "sales and service", and "trades and related industries."

Occupation Characteristics		2011		2006		
Occupation Characteristics	Total	Male	Female	Total	Male	Female
Population 15 years and over	120	65	55	85	45	40
Management	10	0	10	N/A	N/A	N/A
Natural Sciences, Health	10	0	0	N/A	N/A	N/A
Social Sciences, Government	15	0	15	N/A	N/A	N/A
Sales and Service	15	10	10	N/A	N/A	N/A
Trades and Related Occupations	15	15	0	N/A	N/A	N/A
Primary Industry	0	0	0	N/A	N/A	N/A
Other Occupations	0	0	0	N/A	N/A	N/A

Table 4-13. Henvey Inlet First Nation Occupation Characteristics

Source: AANDC, 2015e

Note: In some cases there is missing information, incorrect totals and rounded data. According to AANDC and Statistics Canada, procedures are applied to prevent the possibility of associating statistical data with any identifiable individual: the data are randomly rounded and they are suppressed for certain geographic areas (AANDC, 2015e).

4.2.5.4 Business Activity

There is no commercial activity taking place at HIFN I.R #2. The community has a commercial building at French River Reserve No. 13, as well as a gas station located one kilometer from Highway 69 on Pickerel River Road. The gas bar also sells convenience store items as well as cigarettes.

Key River, located near the eastern extent of I.R. #2, has marina and gas station services available.

4.2.6 Government Structure and Services

4.2.6.1 Governance On-Reserve

The current Chief and Council of Henvey Inlet is listed below.

- Chief Wayne McQuabbie;
- Councillor Brenda Contin;
- Councillor Lionel Fox;
- Councillor Carl Ashawasagai;
- Councillor Patrick Brennan;
- Councillor Tony Solomon; and
- Councillor Genevieve Solomon-Dubois (HIFN, 2015b).

The community is part of the Waabnoong Bemjiwang Association of First Nations, an organization established to provide technical services to member communities, rather than political leadership. The members of this Tribal Council are located within a similar geographic area of Central Ontario and tribal council groupings often have similar cultural, heritage and linguistic characteristics. The Tribal Council members include:

- Henvey Inlet First Nation;
- Dokis First Nation;
- Magnetawan First Nation;

- Nipissing First Nation;
- Wahnapitae First Nation; and
- Wasauksing First Nation (AANDC, 2015a).

HIFN is also part of UOI as discussed previously, as well as the Chiefs of Ontario, two political organizations of Aboriginal chiefs.

4.2.6.2 Governance Off-Reserve

Municipalities adjacent to the HIFN I.R. #2 are the Municipality of Killarney, Henvey Township and Mowat Township. Henvey Township and Mowat Township are two unincorporated townships that are part of the Parry Sound District which do not have local level governance or any local service boards that provide typical municipal services. Much of the land within the townships is Crown land, and is under the jurisdiction of provincial agencies such as MNRF or MTO.

The Municipality of Killarney is a single tier incorporated municipality with its own council and local level governance. The Municipal Council has six members made up of a mayor, three councillors from Ward 1 and two councillors from Ward 2, which is adjacent to the northern boundary of the HIWEC study area (Municipality of Killarney, 2015a). Land use planning within the Municipality of Killarney is under the jurisdiction of the Sudbury East Planning Board and many municipal, social and emergency services are delivered by the Manitoulin-Sudbury District Services Board (DSB) (Municipality of Killarney, 2015b,c).

4.2.6.3 Off-Reserve Social Services and Organizations

The Parry Sound District Social Services Administrative Board (PSDSSAB) oversees programs such as Children's Services such as day care licensing, social housing units, Ontario Works (financial and employment support for those in need), and a Women's Shelter in the Parry Sound District. Licenced childcare centres are located in:

- Parry Sound;
- South River;
- Emsdale; and
- Powassan.

Early Years Programs / Best Start Child and Family Centres are locations enabling parents and children to drop-in, meet, share, and play and find support and information for children's programing. The PSDSSAB identifies that there are over 40 Early Years Programs / Best Start Child and Family Centres throughout the Districts of Parry Sound and Muskoka (PSDSSAB, 2015).

The PSDSSAB owns and operates 209 units in the District through the Parry Sound Housing Corporation. In addition to the PSDSSAB stock, there are 164 units of non-profit housing stock in the District (PSDSSAB, 2015).

The Manitoulin-Sudbury DSB oversees social and emergency services within the Manitoulin District and Sudbury District, including the Municipality of Killarney. The DSB is responsible for Ontario Works, Social Housing, Emergency Medical Services (Land Ambulance) and Early Learning and Child Care Services (Manitoulin-Sudbury DSB, 2015).

4.2.7 Infrastructure

4.2.7.1 Housing

The main HIFN village is on French River Reserve No. 13, along Pickerel River Road. At the present time there are 50 houses; most of which have been built within the last 10 to 15 years. More housing is in the planning stages along Pickerel River Road within French River Reserve No. 13 and further subdivision will occur if the population continues to increase. There is a small population at the HIFN I.R. #2 of approximately 12 households (HIFN, 2015a). Households are located along Bekanon Road and several cottages are located on the shores of Henvey Inlet.

4.2.7.2 Henvey Inlet First Nation Infrastructure and Services

HIFN has a fire hall and first responder service based on French River Reserve No. 13 which serves the local community village. There is a night landing heliport located on the French River Reserve No. 13 to assist with emergency evacuations.

The nearest hospitals are located in Parry Sound (89 km) and Sudbury (76 km). The First Nation offers a community medical van to provide access to local hospitals for non-emergency medical appointments (HIFN, 2015d.) A nursing station is available in Britt, and is part of the West Parry Sound Health Centre system. The station was established in 2012 and has a nurse practitioner on site (HIFN, 2015d; Northeast Health Line, 2015). The Manitoulin-Sudbury DSB has an ambulance and a volunteer fire department with a station near the First Nation in Noëlville which may provide support to the community for emergency calls (Manitoulin-Sudbury DSB, 2015; HIFN, 2015d).

The nearest Ontario Provincial Police station serving the community is located approximately 25 km away in Britt, Ontario.

The HIFN website identifies the following structures within its main village at French River Reserve No. 13:

- Public Works garage 370 m²
 - This structure includes Henvey Inlet Fire and Rescue and the First Response Team.
 - Community events are held in this location as well.
- Commercial building 110 m². This building also includes the current Band Office.
- Former Band Office leased by the Waabnoong Bemjiwang Association of First Nations Tribal Council.
- Subdivision development: Pickerel River Road under development (HIFN, 2015a).
- No school on-Reserve. The community has a daycare and a library, which opened in 1999 and 2000, respectively. The library is notable as it offers public access to reading materials as well as public internet (HIFN, 2015a; HIFN, 2015d).

4.2.7.3 Henvey Inlet First Nation Utilities

4.2.7.3.1 <u>Water</u>

The HIFN village initially obtained water from two pump houses for communal well service at French River Reserve No. 13, while outlying housing at HIFN I.R. #2 and Bekanon Road residents have private wells. A new water treatment facility is now operational at French River Reserve No. 13 serving the HIFN community (HIFN, 2015d).

4.2.7.3.2 Electricity

French River Reserve No. 13 and the homes along Bekanon Road have access to the Ontario electricity grid providing sufficient quantity to meet community needs. Power is connected to the homes along Bekanon Road from the local distribution network operated by HONI.

4.2.7.3.3 Solid Waste

The on-Reserve landfill is non-operational. The community has hired a local contractor to bring waste to the Key River Landfill, a landfill operated by the Municipality of Killarney located off Highway 69 at Key River. The landfill accepts non-hazardous household and commercial waste (Municipality of Killarney, 2015d).

4.2.7.3.4 Communication Services

French River Reserve No. 13 has home mail delivery from Canada Post, access to telephone service from Bell Canada and high speed wireless internet. HIFN I.R. #2 is served by the Britt post office and does not have home delivery. The community has access to local radio and television service from regional centres such as Parry Sound, Sudbury, North Bay and Toronto (HIFN, 2015d).

4.2.7.4 Transportation

The Pickerel River Road provides access through the main HIFN village on French River Reserve No. 13 and a connection with Highway 69 – the main highway serving the Georgian Bay corridor from Parry Sound to Greater Sudbury. French River Reserve No. 13 is located immediately off Highway 69, just south of the Pickerel River.

HIFN I.R. #2 is accessible from Highway 69 and Highway 522, both of which are provincially maintained highways with Highway 69 being part of the Trans-Canada Highway. Within the HIWEC study area, Highway 69 is a paved, two (2) lane highway with passing lanes alternating between the Northbound and Southbound lanes. As of 2010, the annual average daily traffic (AADT) volume for the section of Highway 69 from Highway 526 to Highway 522 is 6,900 (MTO, 2010). Through the Northern Highways Program 2013 - 2017, the Ministry of Northern Development and Mines (MNDM) and MTO have planned to widen the highway to four (4) lanes, with construction occurring in segments along the route between Sudbury and Parry Sound (MNDM, 2013).

Additional modes of transportation serving the HIWEC study area include local marinas located off-Reserve that provide fixed access to the rivers in the area, including the Pickerel and Key Rivers. The Canadian National and Canadian Pacific railway lines intersect each other to the east of HIFN I.R. #2 near the Key River. From this location, the Canadian Pacific railway line continues towards the main community settlement at French River Reserve No. 13 before crossing the Pickerel River. There is no passenger service for the community. The nearest airport to the HIWEC study area by car is the Greater Sudbury Airport located approximately 80 km north from HIFN I.R. #2. There are also a number of local aerodromes and water aerodromes to the east and north within 50 km of the HIWEC study area. Inter-city bus service is also available in both Parry Sound and Sudbury.

4.2.8 Recreation and Tourism

HIFN has a number recreation structures and services on-Reserve for residents at the French River Reserve No. 13. The community built an outdoor rink in 1998 and a baseball diamond in 2000. The community also has a playground and established a small beach for residents on the southeast side of Cantin Lake. The community website identified that the beach has been improved in recent years to make it more enjoyable for residents (HIFN, 2015d).

The broader region is home to many recreational opportunities throughout the year. French River Reserve No. 13 and HIFN I.R. #2 are located near the Pickerel, French and Key Rivers, popular rivers for recreational boating, canoeing, fishing and seasonal cottage rentals.

The community is also located in close proximity to the following Provincial Parks:

- Grundy Lake Provincial Park
- French River Provincial Park

These parks include camping and other recreational amenities that draw visitors to the area and provide opportunities for local businesses in the service industry including marinas at the Pickerel, Key and French Rivers, as well as the trading post at Grundy Lake Road.

Grundy Lake Provincial Park (3,614 ha) received 104,594 visitors in 2010, with 485 developed campsites as well as other interior camping opportunities. The park has 69% camping occupancy during the peak July-August period, or 100,646 camper nights. The French River Provincial Park (73,530 ha) offers only interior camping opportunities (i.e., no developed campsites), and recorded 18,100 camper nights in 2010 (Ontario Parks, 2010).

There are also many trails and open spaces to ride All-Terrain-Vehicles (ATVs) in the spring, summer and fall and ride snowmobiles in the winter months. Many snowmobilers are members of a snowmobile club, which organize group rides and plan for trail maintenance. The North East Georgian Bay snowmobile club is the organization which has jurisdiction in the HIWEC study area (North East Georgian Bay Snowmobile Club, 2015).

The North Georgian Bay Shoreline and Islands Conservation Reserve is located to the south of the HIWEC and is an area of protected Crown land for recreation and traditional land uses. The area is protected from development.

4.2.9 Cultural Resources/ Heritage and Archaeological Sites

The first human settlement in the HIWEC study area can be traced back 10,000 years; these earliest welldocumented groups are referred to in archaeology as "Paleo" meaning old or ancient. The HIWEC study area has been occupied since the glaciers retreated from the land, which allowed for spruce dominated boreal forests to move quickly north, occupying the once open tundra (Hinshelwood, 1990; Phillips, 1993). In response to the natural Canadian Shield environment, the people here would have moved their encampments on a regular basis to be in the locations where these resources naturally became available and the size of the groups occupying any particular location would vary depending on the nature and size of the available food resources. Over time populations increased, but the settlement and subsistence strategy of mobile groups utilizing the rich natural resources of the area remained relatively unchanged. Archaeological research has classified the various developments based on the technological, stylistic patterns, and cultural changes identified in artifacts over time.

During the site planning process for the HIWEC, HIFN identified areas of cultural significance, including areas of past settlement as well as current settlements, and excluded them from the HIWEC study area. In order to fully understand the potential effects of the proposed HIWEC on built heritage and cultural heritage landscapes, a preliminary Heritage Assessment was completed to identify heritage resources including cultural heritage and heritage landscapes of cultural value or interest. The preliminary Heritage Assessment included research on the land use history of the HIWEC study area, cultural heritage features, cultural heritage landscapes and protected properties.

During the preliminary review of cultural heritage resources for the HIWEC, no designated or listed heritage properties and / or structures were identified within the HIWEC study area. Additionally, no historical plaques, National Historic sites, registered cemeteries, or unregistered cemeteries were identified. However, a number of First Nation burial sites, traditional hunting sites, areas of special importance, and sacred sites were identified through a confidential traditional knowledge and land use study provided by HIFN. Five archaeological sites were also identified within and around the HIWEC study area. Due to the sensitivity of this information, the locations and details of these sacred, heritage, and archaeological sites will not be disclosed. In relation to cultural heritage landscapes, the entirety of the HIWEC study area lands has been identified as an important First Nation Cultural Landscape.

Although the results of this preliminary study have identified a number of cultural heritage resources for consideration, there remains the potential for additional properties or features with heritage significance to be identified within the HIWEC study area during the formal heritage assessment process to be documented in the Final Draft EA Report.

During Stage 1 and 2 archaeological assessments, the potential presence of archaeological sites / resources are determined and the effects of the proposed undertaking on archaeological sites or material are evaluated. During the Stage 1 assessment, areas of archaeological potential were identified using desktop sources in the HIWEC study area and a Stage 2 archaeological survey will be conducted once field conditions are appropriate. The Stage 2 archaeological assessment involves the physical survey of all areas with archaeological potential to determine if any archaeological resources are present within the HIWEC study area and will identify which areas are free of archaeological concerns. If archaeological resources are identified, mitigation measures and recommendations for further work will be proposed in the Stage 2 report.

The Stage 1 archaeological assessment determined that there are areas within the HIWEC study area that have the potential to retain archaeological resources. Features that contribute to archaeological potential within the HIWEC study area include the presence of natural environmental features consistent with pre-contact use, early transportation routes, identified burial grounds, previous settlements and areas identified by the community as being of heritage significance. In addition to watercourses, historic transportation routes, early settlements, early industry, well-drained soil and proximity to archaeological features, areas that could support pictograph or quarry sites are also considered to contribute to the archaeological potential. Areas of archaeological potential that may be impacted by the construction of the HIWEC infrastructure must be subject to additional Stage 2 archaeological field investigation prior to any development activities. The Stage 1 Archaeological Assessment Report will be provided in the Final Draft EA Report.

The Stage 2 archaeological assessment involves the physical survey of all areas with archaeological potential to determine if any archaeological resources are present within the HIWEC study area and will identify which areas are free of archaeological concerns. The Stage 2 investigation will involve the standard test pit assessment of the area to be impacted where soil overburden permits, as well as visual inspection of any exposed ground surfaces. The results of the field investigation, as well as proposed mitigation measures if required, and recommendations for further work will be presented in a Stage 2 Archaeological Assessment Report.

4.2.10 Noise

The HIWEC study area is a largely natural landscape with relatively few anthropogenic noise sources. The eastern portion of the study area is adjacent to Highway 69 so existing sound levels in that area are influenced by highway traffic. The HIWEC study area includes several permanent and seasonal residential areas (homes, cottages and lodges) where existing sound levels are primarily associated with residential activities, boat travel along Henvey Inlet and the Key River and natural sounds (weather, wildlife, rustling vegetation, etc.).

4.2.11 Visual Landscape

The visual and aesthetic importance of Georgian Bay and the HIWEC study area is reflected by the numerous artist and photography groups along Georgian Bay, and the local celebration of the Canadian iconic Group of Seven which frequently captured the area's scenic landscapes in their paintings at the beginning of the 20th century. Most of the tourism based businesses within the HIWEC study area and along Georgian Bay and Key River such as resorts, lodges and marinas, heavily rely on the natural landscapes to attract hikers and boaters. In addition, HIFN Council through their Nishshing Aki has identified social and cultural features that their member's value and that must be protected. As part of this EA, visual renderings will be developed to provide an anticipated representation of WTGs in the visual landscape. This will include photographing key site lines and natural landscapes within the HIWEC study area and rendering proposed WTGs and HIWEC components as they will be seen once constructed.
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