Henvey Inlet Wind LP

Henvey Inlet Wind

Interim Design and Operations Report – Henvey Inlet Wind Energy Centre (HIWEC)
draft for discussion

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Project Number:
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Date:
June 2015
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<td>01</td>
<td>LB</td>
<td>June 24, 2015</td>
<td>Interim Draft</td>
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List of Acronyms and Glossary

BMPs .................. Best Management Practices
EA ..................... Environmental Assessment
EEMP ................. Environmental Effects Monitoring Plan
ha ...................... hectare
HIFN ................. Henvey Inlet First Nation
HIW ................... Henvey Inlet Wind
HIWEC ............... Henvey Inlet Wind Energy Centre
Hz ..................... hertz
IEC .................... International Electrotechnical Commission
IESO ................. Independent Electricity System Operator
km ..................... Kilometres
kV ..................... Kilovolt
L/day .................. Litres per day
m ....................... Metre
m² ..................... Metres squared
m/s ................... Metre per second
Met tower ........... Meteorological tower
MOECC ............. Ontario Ministry of the Environment and Climate Change
MSDS ............... Material Safety Data Sheet
MW ................... Megawatt
NHA ................... Natural Heritage Assessment
O&M .................. operations and maintenance
ROW .................. right-of-way
SCADA ............. Supervisory Control and Data Acquisition
SODAR ............. Sonic Detection and Ranging
TS ..................... Transformer Station
WTG .................. Wind Turbine Generator
1. **Introduction and Overview**

1.1 **Henvey Inlet Wind Energy Centre 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.

1.2 **Summary of Design and Operations Report Requirements**

The requirements for the Design and Operations Report defined in the HIFN EA Guidance document are outlined in Table 1-1 along with where information about those requirements can be found in this report.

<table>
<thead>
<tr>
<th>Requirement</th>
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<td>Protected Properties Report)</td>
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This Interim Draft Design and Operations Report has been posted to provide information about HIWEC to HIFN and its members, the public, government agencies and other stakeholders, as early as possible in the EA process.

1.3 **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 1-1). 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 6 provides a more detailed description of the existing environmental conditions within
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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 1-1**.

### 1.4 Proponent Contact and Key Information

The following table provides key HIWEC information.

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<td><strong>Energy Source:</strong></td>
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<td><strong>Contracted Nameplate Capacity:</strong></td>
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<td><strong>Website:</strong></td>
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<td><strong>Email:</strong></td>
</tr>
<tr>
<td><strong>Telephone:</strong></td>
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</tbody>
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2. Site Plan

The Site Plan provides graphic and text descriptions of the HIWEC components, cultural and heritage features, natural heritage features, waterbodies and noise receptors.

2.1 HIWEC Components

This section provides an overview of and describes the location of the HIWEC components. Figure 1-1, Figure 2-1, Figure 2-2, and Figure 2-3 will provide the following site plan information as per the HIFN EA Guidance document, to be provided in the subsequent Draft Design and Operations Report of the Final Draft EA Report:

- HIWEC components;
- Buildings, structures, roads, utility corridors, right-of-ways (ROWs) and easements within 300 m of HIWEC components;
- Groundwater and surface water supplies used at the HIWEC;
- Components from which contaminants are discharged into the air;
- Works for the collection, transmission, treatment, and disposal of sewage;
- Noise receptors;
- The distance between the base of each WTG and the nearest noise receptor;
- Location of natural heritage features and waterbodies within 120 m of HIWEC components;
- Topographical contours, surface water drainage, and any protected heritage properties, heritage resources, archaeological resources, waterbodies, and important natural features;
- The distance between the base of any WTGs and any public road ROWs or railway ROWs that are within 120 m of HIWEC components; and
- Property lines within the HIWEC study area.

Key HIWEC components listed in Table 2-1 are shown on Figure 1-1. A description of the HIWEC components is provided in Section 3 as well as in the Description Report and the Construction Plan Report.

Table 2-1: Temporary Construction and Operation Components

<table>
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<tr>
<th>Permanent HIWEC Components</th>
<th>Temporary HIWEC Components</th>
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<td>- Crane Pads</td>
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<td>- WTG Foundations</td>
<td>- Construction Compounds and Laydown Yards</td>
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<tr>
<td>- Access Roads and Crane Pads</td>
<td>- WTG Staging Areas</td>
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<tr>
<td>- Meteorological Towers (Met Towers)</td>
<td>- Concrete Batch Plant(s)</td>
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<td>- Pad-mounted Transformers and Collector Lines</td>
<td>- Crusher(s)</td>
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<td>- Transformer Stations (TSs)</td>
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<tr>
<td>- On-Reserve Transmission Lines</td>
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<tr>
<td>- Operations and Maintenance (O&amp;M) Building</td>
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The HIWEC was designed to adhere to regulatory setback requirements and to consider potential impacts to local environmental features.

2.2 Cultural Heritage Resources

The precise location of archaeological resources and First Nation heritage resources is sensitive information and, therefore, is not depicted on the Site Plan figures. In addition, the preliminary Heritage Assessment Report for the HIWEC concluded that no protected properties are located within the HIWEC study area and, therefore, are not depicted on the Site Plan figures.

Additional information about the results of cultural heritage and archaeological resources will be provided in the Stage 1 Archaeological Assessment Report (AECOM, 2015a) and the Heritage Assessment Report (AECOM, 2015b), to be provided in the Final Draft EA Report.

2.3 Natural Heritage Features

Natural heritage features that were identified within the HIWEC study area in the Natural Heritage Assessment (NHA) reports are shown on Figure 2-1. Additional information on natural heritage features will be provided in the Final Draft EA Report, specifically in the NHA Report.

2.4 Waterbodies

Figure 2-1 includes all waterbodies within the HIWEC study area that have been identified through site investigation, a comprehensive records review of available material and agency consultation. Additional information on waterbodies from site-specific field studies, including confirmation of potential waterbodies and identification of new features not identified in the records review, will be included in the Water Assessment and Waterbodies Report which will be completed for the Final Draft EA Report.

2.5 Noise Receptors

Noise receptors in the HIWEC study area are shown on Figure 2-3. A Noise Study Report will be completed for the HIWEC in accordance with the HIFN EA Guidance document, to be provided in the Final Draft EA Report.
3. Facility Design Plan

The following section provides a summary of the Facility Design Plan.

3.1 Wind Turbine Generator Technical Specifications

The HIWEC will use wind to generate energy through the use of commercial WTG technology. Approximately 100 to 120 WTGs are currently being assessed for the HIWEC with only 90 to 100 WTGs to be constructed. It is important to note that the total number of WTGs will depend on the nominal rating of each WTG.

Each WTG consists of three major components: tower, nacelle (including the electric generator, wind direction and speed sensors, and auxiliary equipment) and a three-blade rotor. The tower section of the WTG is secured in place by a concrete foundation (approximately 2.5 m deep). Selected WTG specifications will be presented in the subsequent Draft Design and Operations Report of the Final Draft EA Report and the Wind Turbine Specifications Report of the Final Draft EA Report.

3.2 Construction Compounds, Laydown Yards and Wind Turbine Generator Staging Areas

Two (2) temporary construction compound and laydown yards will be constructed for the purpose of staging and storing equipment during the construction phase. Temporary electrical service lines will be connected to the local distribution line for the purpose of providing electrical power to the construction offices. Activities on this site will include materials storage, equipment refuelling and construction offices. The areas will be approximately 4 to 6 hectares (ha) in size.

Approximately 0.6 ha around each WTG will be established for the laydown and assembly of the WTG components.

3.3 Access Roads

Access roads will be constructed to allow access to WTG sites during the construction, installation, operation and maintenance of the HIWEC (please see the Construction Plan Report for additional information). Access roads will be constructed of native materials or engineered fill. The access roads with shoulders will be up to 20 m wide during construction in order to accommodate cranes and transportation equipment used to deliver WTG components.

Access road locations have been determined through constraint mapping and constructability exercises and consultation with HIFN. In addition, as required, all roads associated with the HIWEC will be designed to minimize road and soil erosion as well as adequate stormwater runoff and drainage.

3.4 Operations and Maintenance Building

An O&M building will be constructed to accommodate offices, mess facilities, control facilities, storage space, maintenance work area, and a parking area. An area of approximately 2.8 ha will be required for these facilities. The O&M building will be within the HIWEC study area.

The O&M building will be constructed on a concrete foundation. An access road to the O&M building will be constructed to accommodate construction equipment and on-site traffic during the operation of the HIWEC.
The O&M building will be powered by the local distribution company or via the HIWEC TSs, with an on-site backup power supply. The power will be delivered via overhead poles installed adjacent to the access road and will terminate on a transformer pole adjacent to the O&M building. A cable will then connect the transformer pole to the building electrical service.

3.5 Meteorological Towers

Met towers are an operational requirement of the Independent Electricity System Operator (IESO) for all electricity market participants (this includes all generators of electricity) and allow the IESO to operate the system reliably and safely. The use of meteorological data is key to the safe and efficient operation of a wind energy centre. Some operational decisions made using meteorological data include:

- Cut-in wind speed;
- Cut-out wind speed;
- WTG shut down during potential icing conditions; and
- WTG shut down during extreme weather events.

There are three (3) Met towers currently installed and one (1) additional tower will be installed in the summer of 2015. Met towers are typically up to 100 m in height. Access roads may be constructed to access tower locations and the sites may be surrounded by chain link fence. As needed, additional meteorological equipment will be used to meet IESO market requirements.

3.6 Wind Turbine Generator Foundations

WTG foundation design will be finalized following the completion of site-specific geotechnical investigations. Geotechnical investigations will include sampling and testing boreholes at the WTG locations in the HIWEC study area. Testing in a laboratory will be completed to determine the design requirements of the WTG and associated electrical equipment foundations based on the soil and rock properties. The expected footprint of the WTG foundation excavation is 0.08 ha with an excavated depth of up to 2.5 m.

Options under consideration for the WTG foundation design are a spread-footing foundation and a rock anchor foundation.

3.7 Pad-mounted Transformers

Located immediately adjacent to each WTG will be a pad-mounted transformer that will 'step-up' the voltage of the electricity generated by the WTG to a common collector line voltage (34.5 kV). It is anticipated that the pad-mounted 3-phase 60 hertz (Hz) transformers will be rated to between 3 to 3.5 MVA and will meet all HIWEC siting requirements. The transformers will have an approximate footprint of 6 m².

3.8 Electrical Collector Lines

Collector lines carry the electricity from the pad-mounted transformers to either an adjacent WTG that is connected in parallel, or to a junction box or overhead switch that is connected to several other WTGs within the same electrical circuit. The junction box or overhead switch can contain equipment related to junctions, cable splices and disconnect switches. From the junction box or overhead switch, the electrical power is then carried to the TSs.
The collector lines for the HIWEC will be aboveground, underground or a combination of both as required. The collector lines will be designed in accordance with the Canadian Electrical Safety Association. The sizing of the underground and overhead collector cables will vary based on the collector system loading. The collector lines used for the HIWEC will be suitable for direct burial or overhead on poles and sized according to the HIWEC configuration to minimize voltage drops between WTGs and the TSs. Where possible, underground collector lines will be installed within the access road ROW to minimize the area of disturbed land. Underground collector lines will be buried at a depth of approximately 1 m. Overhead collector lines will be constructed on wood, steel or concrete monopoles. Fibre optic cabling will also be buried adjacent to the collector lines or mounted on pole structures that will connect each WTG to the Supervisory Control and Data Acquisition (SCADA) system. The collector lines will also use grounding conductors that will be sized to meet electrical and safety requirements.

3.9 Transformer Stations

TSs are required to bring together the collector lines and transform the voltage from 34.5 kV to a transmission voltage of 230 kV or 500 kV, depending on the preferred Transmission Line Route to the provincial grid. The TSs will be located within the HIWEC study area. The TSs may include isolation switches, circuit breakers, step-up power transformers, distribution switch-gear capacitor banks, instrument transformers, communication / microwave equipment, SCADA equipment, protection and control equipment, grounding equipment, revenue metering (conforming to IESO market rules), lightning and surge arrestors, station grounding and a control building. TS grounding will follow all applicable electrical safety standards. All equipment installed at the TSs will be connected to the grounding grid and the TSs will be fenced to control access.

All protection and control equipment shall be designed in accordance with the Ontario Energy Board's Transmission System Code requirements.

Secondary containment will be installed around the step-up transformer in each of the TSs to catch any leaked or spilled oil. Secondary containment systems typically consist of a leak proof concrete or plastic basin at the base of the transformers sloped towards an outlet / oil control device. The basin will have sufficient capacity to manage a leak from the transformer equivalent to the volume of transformer oil and lubricants. The capacity will also provide for minimum 24 hour duration, 50 year storm. The basin may be filled with crushed gravel pending final design parameters. The containment system may also include an oil detection system, sump, oil / grit separator, etc.

The design of the secondary containment system will be completed by a Professional Engineer licensed in Ontario and will meet applicable regulatory requirements.

Should a spill occur from the TS during operations, the Spill Prevention and Response Plan developed by HIW will be implemented. This Plan will be developed to include methods to prevent, stop, report and remediate a spill. In addition to the equipment and processes listed above additional procedures will be implemented. As a standard operation procedure each containment area will be inspected after any rain in order to allow any rainwater out. If any sheen is detected by the operation, appropriate collection and disposal methods will be implemented prior to allowing any rainwater out to the containment area. Should a spill occur and contaminants enter the natural environment, generally, HIW will clean up the contaminated material and dispose of it in accordance with federal and/or provincial requirements. HIW will replace the material accordingly.

3.10 Transmission Line

An on-Reserve 230 kV or 500kV transmission line from the HIWEC TSs within HIFN I.R. #2 will be mounted on new poles. The poles will be made of wood, concrete or steel. The Transmission Line off-Reserve to the provincial grid is subject to Ontario Regulation 116/01 and is being assessed under this process which can be found under Volume B of the Final Draft EA Report.
4. Facility Operations Plan

The following section describes the Facility Operations Plan including daily operations activities, routine / unplanned maintenance activities and key process features including: water taking, waste management, stormwater management / erosion and sediment control, sewage management and air emissions.

4.1 Wind Turbine Generator Operation

The proposed HIWEC will be in operation for 30 years, and is anticipated to require up to 15 trained technical and administrative staff, including WTG maintenance technicians and a site supervisor. During the operation of the proposed HIWEC, on-site activities will be limited primarily to scheduled maintenance of the HIWEC components. Additional on-site activities during the operation of the proposed HIWEC will include:

- Equipment Maintenance: Heavy trucks or mobile cranes used for maintenance activities will require periodic servicing and repair. Where possible equipment maintenance will be completed at the O&M building; however, if necessary some equipment may require servicing at WTG locations;
- HIWEC Staff Transport: Daily to weekly travel of technical staff between the O&M building and WTG locations using light trucks;
- Natural Heritage Field Monitoring: Operational monitoring to natural heritage features will be conducted intermittently for approximately three years;
- Field monitoring may also be required to evaluate the performance of HIWEC components. Communication plans are outlined in Section 5 and additional details on monitoring plans and contingency measures related to noise from WTGs will be provided in the subsequent Draft Design and Operations Report of the Final Draft EA Report; and
- Maintenance activities related to WTGs are discussed in Section 4.3.

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 the summer of 2015) (Figure 1-1). 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 such that no WTG will be located further than 5 km from the nearest data collection point. Section 6 provides additional details on the monitoring of meteorological data during the operation of the proposed HIWEC.

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 which is considered to be out of the normal operating range for a WTG, it will be taken out of service immediately. Through the SCADA system the status of the WTG will be reported to the HIWEC operator. Sections 4.2.1 and 4.2.2 contain additional details on WTG operation and monitoring during winter conditions, high wind events and in the event of lightning strikes.

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.
4.2 Meteorological Data

Monitoring of meteorological data from Met towers at an operations centre will allow staff to adapt WTG operation during climatic events that may include high winds and lightning strikes. Details of how the WTGs are able to respond to meteorological conditions are described in the sections below.

4.2.1 Extreme Weather Conditions

Typically, WTGs are designed to operate above wind speeds of three metres per second (m/s). However, at wind speeds of greater than 25 m/s, the blades of a typical WTG will feather out of the wind and the yaw system on the nacelle will rotate the WTG out of the prevailing wind direction. Typical WTGs are also equipped with a secondary safety braking mechanism, mounted on the high-speed shaft connecting the gearbox to the generator. The secondary braking mechanism will activate in the event that there are operational difficulties with the WTG blade pitching and yaw controls.

4.2.2 Lightning Strikes

Typical WTGs are equipped with lightning safeguards which protect the WTGs from the tip of the blades to the foundation. The safeguards enable the lightning current to by-pass all vital WTG components within the blade, nacelle and tower, limiting the potential for damage. An additional safeguard often installed in each WTG includes a shielding system around the control units and processors that are located within the nacelle. The lightning safeguards for HIWEC WTGs are designed according to International Electrotechnical Commission (IEC) 61400 – “Lightning Protection Level I”.

4.3 HIWEC Maintenance

4.3.1 Routine Wind Turbine Generator Maintenance

Routine preventative maintenance activities will be scheduled at approximately six month intervals with specific maintenance tasks scheduled for each interval by a team of up to three technicians. The WTGs do not require any fuel to generate electricity; however, oil and oil filters as well as hydraulic fluid are necessary for operation. Oil and filters will require changing and general WTG maintenance such as cleaning and replacing any worn parts will be completed in accordance with manufacturer specifications.

Scheduled maintenance activities for WTGs will include a complete inspection of the tower, 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. All surplus lubricating oils, grease, rags, batteries and filters will be removed and disposed of at an approved disposal and / or recycling facility according to applicable regulatory requirements. All maintenance activities will adhere to the same waste disposal and spill prevention industry best management practices (BMPs) that will be carried out during construction activities for the proposed HIWEC (please refer to the Construction Plan Report for more information).

Periodic maintenance of HIWEC infrastructure will be required over the life of the HIWEC. If overhead collector lines are used, they will require ongoing condition assessment and vegetation control, as required. Access roads and any watercourse crossings will also be monitored to ensure they remain in compliance over the life of the HIWEC.
4.3.2 Unplanned Wind Turbine Generator Maintenance

WTGs are very reliable and the major components are designed to operate for over 20 years. However, there is a possibility that component failure may occur despite the high 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 faulty 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 used to install the WTGs, may be required. Typically only a small percentage of WTGs would need to be accessed with large equipment during their operating life.

4.3.3 Electrical System Maintenance

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. Finally, vegetation control will be required around the collector lines and on-Reserve transmission line, if installed on poles, to prevent any damage to the lines and ensure safe operation. The vegetation is typically cleared by mechanized equipment (e.g., chainsaw / hydro axe).

4.4 Key HIWEC Operational Features

4.4.1 Water Taking and Supply

A desktop hydrogeological assessment will be completed for the purpose of providing a high level review of existing hydrogeological conditions within the HIWEC study area, describing potential groundwater taking needs of the HIWEC during construction and operation, outlining potential effects of the HIWEC on groundwater resources and providing a mitigation strategy and contingency measures that negate these adverse effects.

Groundwater taking during the operations phase of the HIWEC may be required to provide a non-potable water source to operational staff, as well as for general maintenance activities at the O&M building.

Water takings are expected to be approximately 4,500 L/day and are not expected to exceed 50,000 L/day.

Adverse effects on local groundwater users (residents) and natural ecological features are not known to occur from the operation of groundwater supply wells at such low rates. Therefore, no adverse environmental impacts are expected to occur during operation of the proposed groundwater supply well(s).

4.4.2 Waste Management

The operation of a wind energy centre does not generate a large amount of waste. Oil and filters used in gearboxes and hydraulic systems will need to be changed approximately once every five years, as per manufacturer specifications. Lubricants required for WTGs include gear oil, hydraulic oil, selected grease (main bearing, blade bearing, cardan shaft, yaw bearing and generator) and open gear grease (yaw-gear) and will be changed approximately two times per year. All surplus lubricating oils, grease, rags, batteries and filters will be removed and disposed of at an approved disposal and/or recycling facility. Household wastes (e.g., cardboard, plastics, etc.) generated at the O&M building will either be recycled or disposed of at a local facility.
The amount of oil and grease stored on-site will depend on the availability of disposal vehicles, transportation schedules and the service cycle. Used oil will be stored in a designated area of the O&M building, and picked up by certified contractor with the appropriate manifests in place. There will be no permanent storage of waste on HIFN I.R. #2 during operations.

4.4.3 Stormwater Management / Erosion and Sediment Control

To effectively manage runoff during the operation of the HIWEC, drainage channels will be constructed adjacent to access roads, as required. The decision of where to construct drainage channels will be made during the detailed design stage of the proposed HIWEC. Potential sources of sedimentation during the operation of the proposed HIWEC will be limited to unpaved access roads. These access roads will be gravel-based. No additional sedimentation control measures are anticipated to be required during operation since sedimentation from these roads is predicted to be lower than during construction.

A graveled area around each WTG foundation will receive any precipitation runoff from WTG towers and allow for infiltration into the ground. Runoff from the tower section of a WTG is expected to be negligible compared to the existing runoff within the HIWEC study area. As this does not represent a measureable difference in runoff, no additional Stormwater Management Plans are proposed.

4.4.4 Sewage Management

During site preparation and construction, portable toilets will be used and a licensed contractor responsible for waste removal will be engaged. As well, the O&M building for the HIWEC will include washroom facilities that will be constructed and serviced in accordance with required regulations.

Potable water will be supplied by a well(s) and a septic bed or tank will be constructed for the disposal of sewage. It is HIW’s responsibility to ensure proper maintenance of the septic system or tank. The O&M building, septic system or tank and water supply will be constructed and operated in accordance with all applicable standards.

4.4.5 Air Emissions

During each phase of the HIWEC, activities requiring the use of motorized vehicles (e.g., transportation of maintenance personnel to WTG sites) will have infrequent and short-term emissions of low levels of greenhouse gases and other compounds. These emissions will likely be negligible compared to normal operation of motorized vehicles in the HIWEC study area and will be temporary in nature. Section 6 of this Report outlines potentially negative effects to air quality relating to the HIWEC and identifies proposed mitigation measures; these will be finalized and provided in the subsequent Draft Design and Operations Report of the Final Draft EA Report.

HIWEC noise emissions during operation activities will be assessed in the Noise Study Report, to be provided in the subsequent Draft Design and Operations Report of the Final Draft EA Report.

HIWEC activities are not anticipated to generate any odour emissions.
5. Emergency Response and Communications

This section was prepared in accordance with HIFN EA Guidance requirements to define an avenue for ongoing communication throughout the construction, operation and decommissioning phases of the HIWEC. This will ensure that members of the HIFN community, other Aboriginal communities, local municipalities and other stakeholders are kept apprised of pertinent activities, in addition to any emergencies in the unlikely event that one should occur. The following sections outline HIW’s communication commitments in relation to emergency response, ongoing communication and complaint management.

5.1 Emergency Response

Throughout the construction, operation and decommissioning phases of the HIWEC, an up-to-date Emergency Response and Communication Plan (the Plan) will be prepared and maintained by the contractor at the construction trailers during construction and decommissioning and then at the O&M building for operations. The Plan will contain current contact information for emergency responders, including local police and fire departments, and will outline communication protocols should an emergency situation arise. The HIWEC Emergency Response and Communication Plan will also include the following information:

- Designation of facility emergency co-ordinators;
- Process description for responding to emergencies;
- Objectives for emergency response and communication;
- Local emergency response contact phone numbers;
- Regulatory references;
- Required health and safety training for employees;
- Facility information, including exact location;
- Facility emergency procedures;
- Immediate site evacuation procedures and routes;
- Delayed site evacuation procedures;
- Process for documenting personnel injuries / serious health conditions;
- Fire response plan;
- Process for documenting chemical / oil spills and releases;
- Material Safety Data Sheets (MSDS) for all chemicals used in construction and maintenance;
- Reporting requirements; and
- Weather-related emergency procedures.

The Plan’s communication protocol will include the following steps:

- The person observing the emergency will contact first responders immediately via 911; and
- If the emergency is a spill, a HIWEC representative will then contact the Regional Director of Environment Canada’s Ontario Region, if required, in accordance with Section 102 of the Canadian Environmental Protection Act and the local municipalities / response personnel.

Depending on the nature of the incident, HIW in consultation with HIFN, will notify the community. The Plan will be maintained on-site and updated when required.
5.2 Non-Emergency Communications

HIFN’s Band Council, local residents and regulatory permit holders may be notified through mailings of updates on HIWEC activities and changes to procedures. Examples of non-emergency communications that may be communicated through mailings include:

- Commencement of construction and installation activities for the HIWEC;
- Maintenance activities that are considered outside of routine maintenance (e.g., WTG disassembly or replacement of collector lines);
- Commencement of decommissioning activities for the HIWEC; and
- Any additional information about the HIWEC that HIW considers to be of interest HIFN’s Band Council, local residents and regulatory permit holders.

When advanced notification of HIWEC activities is feasible, letter communications will identify in detail the activity being carried out, anticipated schedule of the activity, and contact information for submitting any concerns and/or complaints. If notification is required after an unanticipated event, the letter will describe the event, mitigation strategies to prevent future occurrences, and contact information for submitting any concerns and/or complaints.

5.3 Complaints Resolution Process

HIW acknowledges that some members of the HIFN community may have concerns regarding construction activities and long-term operations. To address concerns in a collaborative manner, HIW will follow the complaints resolution process described below:

- Community members are to provide any concerns they have through the HIW email address and/or phone number.
- Should any complaints arise throughout the course of the construction, operation and decommissioning phases, a HIW representative will contact the complainant to understand the issue and address as appropriate. A complaint record will be established and will include the following:
  a) Name, address and phone number of the complainant;
  b) Date and time of the complaint;
  c) Details of the complaint;
  d) Follow-up action to be taken; and
  e) Steps taken to prevent the situation from occurring in the future, where applicable.
- An updated Complaint Record will be maintained to describe the proposed resolution of the complaint, where applicable.
6. Environmental Effects Monitoring Plan

This section describes the potential environmental effects that may result from the daily function of the HIWEC. The potential effects and proposed mitigation measures described below are also presented in Section 4 of the Description Report. The assessment of potential environmental effects and development of proposed mitigation measures have been completed in accordance with the HIFN EA Guidance document and address the following environmental considerations:

- Cultural Heritage and Archaeology;
- Natural Heritage;
- Surface and Groundwater;
- Air, Odour, Dust;
- Noise;
- Local Interests, Land Use and Infrastructure;
- Public Health and Safety;
- Other Resources; and
- Areas Protected under Provincial Plans and Policies.

For each potential effect, performance objectives were developed to describe a desired outcome of proposed mitigation. Next, mitigation measures were proposed to achieve the performance objectives. The proposed mitigation measures that are described in this section will be confirmed based on site conditions identified through field investigations occurring during the spring and summer of 2015. In the subsequent Draft Design and Operations Report of the Final Draft EA Report, net effects, which are those effects that remain following the application of proposed mitigation measures and monitoring commitments, will then be determined based on professional judgment as well as previous project experience. Where possible, the importance of adverse net effects will be described based on the following:

- **Magnitude** .......... the size or degree of the effect compared against baseline conditions; and
- **Likelihood** .......... the probability that the effect will occur.

Finally, monitoring commitments will be identified in the subsequent Draft Design and Operations Report of the Final Draft EA Report. They are intended to verify that the proposed mitigation measures achieve performance objectives. Should the monitoring during the operation of the HIWEC reveal that the proposed mitigation measures are not achieving the intended results; the identified contingency measures will then be implemented.

6.1 Cultural Heritage and Archaeology

6.1.1 Existing Conditions

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. These areas of cultural significance are known as Nishshing Aki, specifically defined as existing social, cultural or economic features or conditions that have been identified by HIFN or designated as valued by HIFN with community input as provided in the Land Code. Nishshing Aki are discussed further in Section 6.6. 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.

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 recommendation for further work will be presented in a Stage 2 Archaeological Assessment Report.

### 6.1.2 Potential Effects and Proposed Mitigation Measures

#### 6.1.2.1 Operations

No effects to cultural heritage or archaeological resources are anticipated as a result of the operational phase, as HIWEC components have been sited to avoid any features. Therefore, no mitigation measures are proposed.
6.2 Natural Heritage

6.2.1 Existing Conditions

6.2.1.1 Wetlands and Vegetation Communities

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 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).

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

- Shallow Atlantic Coastal Marshes
- Cliffs and Talus Slopes
- Precambrian Rock Barrens
- Old-growth or Mature Forests
- Bogs
- Rare Forests (Red Spruce, Jack Pine and White Oak)

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).

6.2.1.2 Birds

The following bird habitats (including birds listed under the Migratory Birds Convention Act, 1994 (MBCA)) were identified as potentially occurring in the HIWEC study area through the background review:

- Waterfowl Stopover and Staging Areas (Aquatic)
- Shorebird Migratory Stopover Areas (Shorebird Staging)
- Colonially-Nesting Bird Breeding Habitat (Bank and Cliff)
- Colonially-Nesting Bird Breeding Habitat (Trees/Shrubs)
- Colonially-Nesting Bird Breeding Habitat (Ground)
- Waterfowl Nesting Areas
- Bald Eagle and Osprey Nesting, Foraging and Perching Habitat
- Woodland Raptor Nesting Habitat
- Mast Producing Areas
- Marsh Bird Breeding Habitat

The presence, boundaries and characteristics of these Important Wildlife Habitats (IWH)\(^1\) within the HIWEC study area will be determined during the field studies scheduled in the spring and summer 2015.

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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.
6.2.1.3 Mammals

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

- Bat Hibernacula
- Bat Maternity Colonies
- Deer Yarding Areas
- Aquatic Feeding Habitat
- Mineral Licks
- Denning Sites for Mink, Otter, Marten, Fisher and Eastern Wolf
- Mast Producing Areas
- Deer Movement Corridors
- Furbearer Movement Corridors

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.

6.2.1.4 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 Habitat (Wetland)
- Amphibian Corridors

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.

6.2.1.5 Reptiles

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

- Turtle Wintering Areas
- Reptile Hibernacula
- Turtle and Lizard Nesting Areas

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.

6.2.1.6 Species of Conservation Concern

Bird, mammal, amphibian and reptile Species of Conservation Concern (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 6-1. 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.

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.

Table 6-1: SOCC Potentially Occurring in the HIWEC Study Area

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>S-rank 1</th>
<th>ESA Status 2</th>
<th>COSEWIC Status 3</th>
<th>SARA Status 4</th>
<th>Observed in 2011</th>
<th>Observed in 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bird Species (9)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>Haliaeetus leucocephalus</td>
<td>S2</td>
<td>SC</td>
<td>NAR</td>
<td>NAR</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Black Tern</td>
<td>Chlidonias niger</td>
<td>S3</td>
<td>SC</td>
<td>NAR</td>
<td>NAR</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Caspian Tern</td>
<td>Sterna caspia</td>
<td>S3</td>
<td>NAR</td>
<td>NAR</td>
<td>NAR</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Eastern Wood-Pewee</td>
<td>Contopus virens</td>
<td>S4</td>
<td>SC</td>
<td>SC</td>
<td>No Status (No Schedule)</td>
<td>No</td>
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<td>Falco peregrinus</td>
<td>S3</td>
<td>SC</td>
<td>SC</td>
<td>SC (Schedule 1)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Prairie Warbler</td>
<td>Setophaga discolor</td>
<td>S3</td>
<td>NAR</td>
<td>NAR</td>
<td>NAR</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Rusty Blackbird</td>
<td>Euphagus carolinus</td>
<td>S4</td>
<td>NAR</td>
<td>SC</td>
<td>SC (Schedule 1)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Wood Thrush</td>
<td>Hylocichla mustelina</td>
<td>S4</td>
<td>SC</td>
<td>THR</td>
<td>No Status (No Schedule)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Yellow Rail</td>
<td>Coturnicops noveboracensis</td>
<td>S4</td>
<td>SC</td>
<td>SC</td>
<td>SC (Schedule 1)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Insect Species (3)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horned Clubtail</td>
<td>Arigomphus cornutus</td>
<td>S3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Monarch</td>
<td>Danaus plexippus</td>
<td>S2</td>
<td>SC</td>
<td>SC</td>
<td>SC (Schedule 1)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Mottled Darner</td>
<td>Aeshna clepsydra</td>
<td>S3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Mammal Species (1)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Wolf</td>
<td>Canis lupus lycaen</td>
<td>S4</td>
<td>SC</td>
<td>SC</td>
<td>SC (Schedule 1)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Reptile Species (5)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Five-lined Skink (Southern Shield population)</td>
<td>Pleistodon fasciatus pop. 2</td>
<td>S3</td>
<td>SC</td>
<td>SC</td>
<td>SC (Schedule 1)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Eastern Ribbonsnake</td>
<td>Thamnophis sauritus</td>
<td>S3</td>
<td>SC</td>
<td>SC</td>
<td>SC (Schedule 1)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Milksnake</td>
<td>Lampropeltis triangulum</td>
<td>S3</td>
<td>SC</td>
<td>SC</td>
<td>SC (Schedule 1)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Northern Map Turtle</td>
<td>Gageptemys geographica</td>
<td>S3</td>
<td>SC</td>
<td>SC</td>
<td>SC (Schedule 1)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Snapping Turtle</td>
<td>Chelydra serpentina</td>
<td>S3</td>
<td>SC</td>
<td>SC</td>
<td>SC (Schedule 1)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

1. S-rank: S1 = Endangered, S2 = Threatened, S3 = Special Concern
2. ESA Status: NAR = Not at Risk, SC = Special Concern
3. COSEWIC Status: NAR = Not at Risk, SC = Special Concern
4. SARA Status: NAR = Not at Risk, SC = Special Concern, THR = Threatened, Endangered, or Exposed
6.2.1.7 Species at Risk

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

Species listed as Endangered or Threatened under Schedule 1 of the SARA are protected on HIFN I.R. #2. 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. Of these, ten (10) species were recorded within the HIWEC study area either by LGL or Stantec in 2011 and 2013, respectively. These species are listed in Table 6-2.

### Table 6-2: Federal Terrestrial Species at Risk Potentially Occurring in the HIWEC Study Area

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>S-rank¹</th>
<th>ESA Status²</th>
<th>COSEWIC Status³</th>
<th>SARA Status ⁴</th>
<th>Observed in 2011</th>
<th>Observed in 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amphibian Species (1)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield Population)</td>
<td><em>Pseudacris triseriata pop. 1</em></td>
<td>S3</td>
<td>NAR</td>
<td>THR</td>
<td>THR (Schedule 1)</td>
<td>Yes</td>
<td>Possibly but not confirmed</td>
</tr>
<tr>
<td><strong>Bird Species (6)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada Warbler</td>
<td><em>Cardellina pusilla</em></td>
<td>S4</td>
<td>SC</td>
<td>THR</td>
<td>THR (Schedule 1)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Common Nighthawk</td>
<td><em>Chordeiles minor</em></td>
<td>S4</td>
<td>SC</td>
<td>THR</td>
<td>THR (Schedule 1)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Golden-winged Warbler</td>
<td><em>Vermivora chrysoptera</em></td>
<td>S4</td>
<td>SC</td>
<td>THR</td>
<td>THR (Schedule 1)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Least Bittern</td>
<td><em>Ixobrychus exilis</em></td>
<td>S4</td>
<td>THR</td>
<td>THR</td>
<td>THR (Schedule 1)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Olive-sided Flycatcher</td>
<td><em>Contopus borealis</em></td>
<td>S4</td>
<td>SC</td>
<td>THR</td>
<td>THR (Schedule 1)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td><em>Caprimulgus vociferus</em></td>
<td>S4</td>
<td>THR</td>
<td>THR</td>
<td>THR (Schedule 1)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Mammal Species (3)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little Brown Bat</td>
<td><em>Myotis lucifugus</em></td>
<td>S4</td>
<td>END</td>
<td>END</td>
<td>END (Schedule 1)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Northern Myotis Bat</td>
<td><em>Myotis septentrionalis</em></td>
<td>S4</td>
<td>END</td>
<td>END</td>
<td>END (Schedule 1)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Tri-coloured Bat</td>
<td><em>Perimyotis subflavus</em></td>
<td>S3?</td>
<td>END</td>
<td>END</td>
<td>END (Schedule 1)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Reptile Species (6)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blanding’s Turtle</td>
<td><em>Emydoidea blandingii</em></td>
<td>S3</td>
<td>THR</td>
<td>THR</td>
<td>THR (Schedule 1)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Eastern Foxsnake (Georgian Bay population)</td>
<td><em>Pantherophis gloydi pop. 1</em></td>
<td>S3</td>
<td>THR</td>
<td>END</td>
<td>END (Schedule 1)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Eastern Hog-nosed Snake</td>
<td><em>Heterodon platirhinos</em></td>
<td>S3</td>
<td>THR</td>
<td>THR</td>
<td>THR (Schedule 1)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Eastern Musk Turtle</td>
<td><em>Stethorus odoratus</em></td>
<td>S3</td>
<td>SC</td>
<td>SC³</td>
<td>THR (Schedule 1)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Massasauga Rattlesnake (Great Lakes / St. Lawrence population)</td>
<td><em>Sistrurus catenatus pop. 1</em></td>
<td>S3</td>
<td>THR</td>
<td>Non-Active</td>
<td>THR (Schedule 1)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Spotted Turtle</td>
<td><em>Clemmys guttata</em></td>
<td>S3</td>
<td>END</td>
<td>END</td>
<td>END (Schedule 1)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
These species 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).

No federally protected aquatic species were identified within the HIWEC study area.
6.2.2 Potential Effects and Proposed Mitigation Measures

The Natural Heritage Assessment (NHA) Environmental Impact Study (EIS) Report describes the potential effects, proposed mitigation measures, and net effects of constructing, operating, and decommissioning the HIWEC on important natural features. An Environmental Effects Monitoring Plan (EEMP) describes the post-construction monitoring plan for bird and bat mortality and related proposed mitigation and contingency measures, as well as post-construction monitoring requirements for potential operational effects to identify IWH. The findings of these reports are summarized below; key natural heritage features are provided in Site Plan Figure 2-1. The NHA also identifies the potential impacts and associated proposed mitigation measures related to SAR. The NHA EIS and EEMP will be provided in the Final Draft EA Report.

6.2.2.1 Generalized Candidate Important Wildlife Habitat

Table 6-3 describes the proposed mitigation measures associated with potential effects to Generalized Candidate IWH resulting from operations.

6.2.2.2 Important Wildlife Habitat

Proposed mitigation measures associated with potential effects to IWH resulting from operations will be provided in the subsequent Draft Design and Operations Report of the Final Draft EA Report.

6.2.2.3 Important Wetlands

Table 6-4 describes the proposed mitigation measures and monitoring plan associated with potential effects to Important Wetlands resulting from operations.

6.2.2.4 Important Woodlands

Table 6-5 describes the proposed mitigation measures and monitoring plan associated with potential effects to Important Woodlands resulting from operations.

6.2.2.5 Species at Risk

Proposed mitigation measures associated with potential effects to Species at Risk resulting operations will be provided in the subsequent Draft Design and Operations Report of the Final Draft EA Report.

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2. **Important Wetland**: Land such as a swamp, marsh, bog or fen, other than land that is being used for agricultural purposes and no longer exhibits wetland characteristics, that (a) is seasonally or permanently covered by shallow water or has the water table close to or at the surface, and (b) has hydric soils and vegetation dominated by hydrophytic or water-tolerant plants, and that has been determined to be important using applicable evaluation criteria or procedures established or accepted by the Ministry of Natural Resources and Forestry.

3. **Important Woodland**: Treed area, woodlot or forested area, other than a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees, that is located south and east of the Canadian Shield, and that has been determined to be important using applicable evaluation criteria or procedures established or accepted by the Ministry of Natural Resources and Forestry.
### Table 6-3: Proposed Mitigation Measures Associated with Potential Effects to Generalized Candidate Important Wildlife Habitat Resulting from Operations

<table>
<thead>
<tr>
<th>Potential Effect</th>
<th>Performance Objective(s)</th>
<th>Proposed Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No effects on Generalized Candidate IWH during operation.</td>
<td>• None required.</td>
<td>• None required.</td>
</tr>
</tbody>
</table>

### Table 6-4: Proposed Mitigation Measures Associated with Potential Effects to Important Wetlands Resulting from Operations

<table>
<thead>
<tr>
<th>Important Wetland Feature(s)</th>
<th>Potential Effects</th>
<th>Performance Objectives</th>
<th>Proposed Mitigation Measures</th>
</tr>
</thead>
</table>
| Construction activities within 120 m of an Important Wetland | • Risk of soil or water contamination from oil, gas, etc. during maintenance activities within 30 m of Important Wetlands. | • No on-site contamination of soil, groundwater or surface water. | • Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemicals or to avoid contamination of adjacent IWH features and train staff on associated procedures. This plan will include, for example:  
[Protocols for access to additional spill clean-up materials if needed.](#)  
[Contaminated materials to be handled in accordance with relevant federal and provincial guidelines and standards.](#)  
[Proper training of operational staff on associated emergency response plan and spill clean-up procedures.](#)  
[Material Safety Data Sheets (MSDS) which provides information on proper handling of chemicals readily available for the types of chemicals that will be used on-site.](#)  
[Spills to be cleaned up immediately, with contaminated soils removed to a licensed disposal site, if required.](#)  
[Materials contained in spill clean-up kits are restocked as necessary.](#)  
[Apply the following general mitigation measures to avoid soil or water contamination:](#)  
[Ensure machinery is maintained free of fluid leaks.](#)  
[Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done in specified areas at least 30 m away from natural features (wetlands, woodlands and wildlife habitats) or waterbodies.](#)  
[Store any stockpiled materials at least 30 m away from an IWH, wetlands, woodlands, wildlife habitats, or waterbodies.](#)  
[Also refer to “Risk of soil or water contamination from oil, gas, etc. during maintenance activities within 30 m of Important Wetlands” in the Important Wetlands Operations Table for additional proposed mitigation measures.](#) |

### Table 6-5: Proposed Mitigation Measures Associated with Potential Effects to Important Woodlands Resulting from Operations

<table>
<thead>
<tr>
<th>Important Woodland Feature(s)</th>
<th>Potential Effects</th>
<th>Performance Objectives</th>
<th>Proposed Mitigation Measures</th>
</tr>
</thead>
</table>
| Construction activities within 120 m of an Important Woodland | • Risk of soil or water contamination from oil, gas, etc. during maintenance activities within 30 m of Important Woodlands. | • No off-site contamination of soil, groundwater or surface water. | • Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemical spills during maintenance activities to avoid contamination of adjacent woodland features and train operational staff on associated procedures.  
[Apply the following general mitigation measures to avoid soil or water contamination:](#)  
[Ensure machinery is maintained free of fluid leaks.](#)  
[Site maintenance, vehicle maintenance, vehicle washing and refueling to be done in specified areas at least 30 m away from natural features (wetlands, woodlands and wildlife habitats) or waterbodies.](#)  
[Store any stockpiled materials at least 30 m away from an IWH, wetlands, woodlands, wildlife habitats, or waterbodies.](#)  
[Also refer to “Risk of soil or water contamination from oil, gas, etc. during maintenance activities within 30 m of Important Wetlands” in the Important Wetlands Operations Table for additional proposed mitigation measures.](#) |
6.3 Surface and Groundwater

6.3.1 Surface Water Existing Conditions

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.

All waterbody features will be documented and assessed in the Draft Water Assessment and Waterbody Report of the Final Draft EA Report in accordance with the HIFN EA Guidance.

6.3.2 Groundwater Existing Conditions

6.3.2.1 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. 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.

6.3.2.2 Geological Setting

6.3.2.2.1 Bedrock Geology

The HIWEC study area is located within the Britt Domain of the Central Gneiss Belt 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).

6.3.2.2.2 Overburden 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.

6.3.2.2.3 Groundwater Resources

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 MOECC Water Well Database.
Results are shown in Figure 2-2, 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 6-6, 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.

<table>
<thead>
<tr>
<th>Primary Well Use</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>3</td>
</tr>
<tr>
<td>Domestic</td>
<td>17</td>
</tr>
<tr>
<td>Monitoring and Test Hole</td>
<td>3</td>
</tr>
<tr>
<td>Municipal</td>
<td>1</td>
</tr>
<tr>
<td>Not Used</td>
<td>2</td>
</tr>
<tr>
<td>Public</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28</strong></td>
</tr>
</tbody>
</table>

### 6.3.3 Potential Effects and Proposed Mitigation Measures

#### 6.3.3.1 Surface Water

##### 6.3.3.1.1 Operations

Table 6-7 identifies potential effects on surface water resources that could occur during the operations phase of the HIWEC and identifies proposed mitigation strategies.
Table 6-7: Proposed Mitigation Measures Associated with Potential Effects to Surface Water Resulting from Operations

<table>
<thead>
<tr>
<th>Potential Effect</th>
<th>Performance Objectives</th>
<th>Proposed Mitigation Strategy</th>
</tr>
</thead>
</table>
| • Adverse Impacts on Surface Water Quality, Aquatic Biota and Habitat Due to Contaminant Spills, Dust and Emissions from Maintenance Vehicles and Equipment | • Prevent contaminant discharge to the environment.                                      | • Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemical spills during maintenance activities to avoid contamination of adjacent waterbodies and train operational staff on associated procedures.  
  • Apply the following general mitigation measures to avoid soil or water contamination:  
    • Ensure machinery is maintained free of fluid leaks.  
    • Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done in specified areas at least 30 m away from natural features (wetlands, woodlands and wildlife habitats) or waterbodies.  
    • Store any stockpiled materials at least 30 m away from an IWH, wetlands, woodlands, wildlife habitats, or waterbodies.  
    • Also refer to “Risk of soil or water contamination from oil, gas, etc. during maintenance activities within 30 m of Important Wetlands” in the Important Wetlands Operations Table for additional proposed mitigation measures.  
  • Conduct access road maintenance (e.g., grading, addition of coarse surficial material) as required to maintain adequate road conditions. This will assist in minimizing dust generation.  
  • Restrict vehicle traffic to posted speed limits.  
  • Spray water as a dust suppressant to be used as necessary.  
  • Minimize vehicle traffic on exposed soil.  
  • Investigate complaints related to dust and emissions and address to the extent possible.  
  • Run vehicles and equipment only when necessary (limit idling).  
  • Use and maintain emission control devices on motorized equipment (as provided by the manufacturer of the equipment) to minimize the emissions so that they remain within industry standards. Heavy equipment and machinery to be used within operating specifications. |
| • Obstruction of Lateral Flows and Fish Passage in Waterbodies Due to Design of Culverts and Debris Build-Up at Water Crossings | • Minimize lateral flow obstructions.                                                   | • Design culverts to accommodate high flows of the watercourse.  
  • Inspect culverts during routine maintenance activities for buildup of debris and remove debris as necessary to maintain flows and allow fish passage. |
6.3.3.2 Groundwater

6.3.3.2.1 Operations

Table 6-8 identifies potential effects on groundwater resources that could occur during the operations phase of the HIWEC and describes proposed mitigation strategies.
Table 6-8: Proposed Mitigation Measures Associated with Potential Effects to Groundwater Resulting from Operations

<table>
<thead>
<tr>
<th>Potential Effect</th>
<th>Performance Objective</th>
<th>Proposed Mitigation Strategy</th>
</tr>
</thead>
</table>
| • Contamination of Groundwater as a Result of Spills During Operation           | • Prevent contaminant discharge to the environment.                                      | • Develop and implement a Spill Prevention and Response Plan outlining steps to prevent and contain any chemical spills during maintenance activities to avoid contamination of adjacent waterbodies and train operational staff on associated procedures.  
  • Ensure machinery is maintained free of fluid leaks.  
  • Site maintenance, vehicle maintenance, vehicle washing and refuelling to be done in specified areas at least 30 m away from natural features (wetlands, woodlands and wildlife habitats) or waterbodies.  
  • Store any stockpiled materials at least 30 m away from an IWH, wetlands, woodlands, wildlife habitats, or waterbodies.  
  • Also refer to “Risk of soil or water contamination from oil, gas, etc. during maintenance activities within 30 m of Important Wetlands” in the Important Wetlands Operations Table for additional proposed mitigation measures.  
  • Locate O&M Building outside of groundwater vulnerable areas (i.e., existing private water wells). |
| • Minor Reduction in Groundwater Recharge Quantities Due to Increases in Impervious Surfaces (e.g., WTG foundations, access roads and buildings) and Changes to Infiltration and Surface Runoff Patterns | • Minimize the increase in impervious areas.  
  • Limit disturbances to surface water drainage patterns. | • Mitigation measures to increase groundwater infiltration will be applied during the design and construction phase and are included in the Groundwater Construction and Decommissioning Table of the Construction Plan Report. |
6.4 Air, Odour and Dust

6.4.1 Existing Conditions

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, 2010).

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, 2014b).

6.4.2 Potential Effects and Proposed Mitigation Measures

6.4.2.1 Operations

During the operation of the HIWEC, maintenance activities have the potential to cause infrequent, localized and short-term fugitive dust and emissions typical to the operation of motorized vehicles. These emissions are expected to be considerably lower in magnitude than during the construction and the decommissioning activities.

No emissions of odours are anticipated during operations.

Table 6-9 identifies potential effects on air quality that could occur during the operations phase of the HIWEC and identifies proposed mitigation strategies.

<table>
<thead>
<tr>
<th>Potential Effect</th>
<th>Performance Objective</th>
<th>Proposed Mitigation Strategy</th>
</tr>
</thead>
</table>
| Generation of Dust Causing Potential Effects to the Natural Environment, Community Members and Workforce | No persistent dust films (observable build-up) on nearby properties, vegetation, and waterbodies. | - Restrict vehicle traffic to posted speed limits.  
- Spray water as a dust suppressant to be used on access roads as necessary.  
- Avoid unnecessary idling of engines.  
- Minimize clearing of vegetation, maintain windbreaks and restore disturbed areas as soon as possible to minimize duration of soil exposure which will limit potential for dust generation.  
- Investigate complaints related to dust and emissions and address to the extent possible.  
- Use and maintain emission control devices on motorized equipment (as provided by the manufacturer of the equipment) to minimize the emissions so that they remain within industry standards. Heavy equipment and machinery to be used within operating specifications.  
- Equip vehicles with effective muffler and exhaust systems.  
- Ensure that construction equipment is frequently maintained and kept in good working condition. |
| Vehicle / Equipment Emissions | Limited release of air emissions. | - |
6.5 Noise

6.5.1 Existing Conditions

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.).

6.5.2 Potential Effects and Proposed Mitigation Measures

6.5.2.1 Operations

The operation of WTGs and the TSs will generate noise that has the potential to affect local residents. Table 6-10 identifies potential effects from noise that could occur during the operations phase of the HIWEC and identifies proposed mitigation strategies.

Table 6-10: Proposed Mitigation Measures Associated with Noise Resulting from Operations

<table>
<thead>
<tr>
<th>Potential Effect</th>
<th>Performance Objective</th>
<th>Proposed Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased Noise Levels at Receptors Due To WTG Operation.</td>
<td>Noise at all non-participating noise receptors below 40 decibels (dBA).</td>
<td>Complaints about noise will be logged and addressed in accordance with Section 5.3 of this Report.</td>
</tr>
<tr>
<td>Increased Noise Levels at Receptors Due to TS Operation.</td>
<td>Noise at all non-participating noise receptors below 40 dBA.</td>
<td>Complaints about noise will be logged and addressed in accordance with Section 5.3 of this Report.</td>
</tr>
<tr>
<td>Increased Noise Due to Maintenance Vehicles and Equipment.</td>
<td>Minimize noise levels and adhere to HIFN and other applicable noise by-laws,</td>
<td>Equip vehicles with effective muffler and exhaust systems. Avoid unnecessary idling of engines. Ensure that maintenance equipment is frequently maintained and kept in good working condition. Ensure that noise emissions from maintenance equipment not exceed guidelines specified in MOECC publication NPC-115 and manufacturer recommendations. Conduct noise compliance checks of maintenance equipment. Implement operation speed limit on unpaved roads. Schedule maintenance activities to comply with noise by-laws, where possible. Seek by-law exemptions if operations and maintenance works will not be in compliance with HIFN or other local noise by-laws.</td>
</tr>
</tbody>
</table>

6.6 Local Interests, Land Use and Infrastructure

6.6.1 Existing Conditions

Local interests, land uses and infrastructure were taken into consideration during the design phase of the HIWEC. All WTGs have been sited to meet or exceed setbacks required by the HIFN EA Guidance document.
6.6.1.1 Traditional Anishinabek Land Uses and Resources

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.
6.6.1.2 Nishshing Aki

As described previously, Nishshing Aki are defined as existing social, cultural or economic features or conditions that have been identified by HIFN or designated as valued by HIFN with community input as provided in the Land Code. These include sacred sites, burial grounds and old settlements.

6.6.1.3 Current Anishinabek Land Use

HIFN’s Land Code governs 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).

6.6.1.4 Adjacent Properties

Property line setbacks are to be assessed in the subsequent Draft Design and Operations Report of the Final Draft EA Report, in accordance with the HIFN EA Guidance document. This requires mapping and a description of the distance between the base of any WTGs and all legal boundaries of the parcel of land on which the WTG is constructed, installed, or expanded within a distance equivalent to the height of the WTG, excluding the length of any blades.

6.6.1.5 Local Infrastructure, Roads and Traffic

The HIWEC Site Plan (Figure 1-1) displays existing local and provincial roads in proximity to the HIWEC study area. 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).

6.6.1.6 Telecommunication and Weather Towers

HIW has provided notices to telecommunication companies in the area and agencies operating telecommunication systems in the province to provide details on the HIWEC. To date, HIW has received confirmation from the Canadian Department of National Defence, the Royal Canadian Mounted Police, and Ontario Ministry of Government Services that the operation of their radio communication systems will not be impacted by the HIWEC.
There are five television stations broadcasting in the vicinity of the HIWEC study area. Digital television signals are not impacted by WTGs or transmission infrastructure and therefore it will be confirmed through consultation whether those five stations have converted or plan to convert to digital technology. No FM or AM broadcast stations have been identified within proximity of proposed WTGs that would impact broadcast signals (YRH, 2011). An Environment Canada weather radar tower is located approximately 6.5 km from the HIWEC study area. HIW will continue to engage with EC to identify and mitigate any impact on the operations of the weather radar tower.

6.6.1.7 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 are discussed in Volume B.

6.6.1.8 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 members value and that must be protected. As part of this EA, visual renderings will be developed to provide an anticipated representation of the 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.

6.6.2 Potential Effects and Proposed Mitigation Measures

6.6.2.1 Operations

During the operation of the HIWEC, Highway 69 capacity and traffic could be affected in the area of the HIWEC entrance if the replacement of a major WTG component (e.g., gear box or rotor) is needed, since specialized equipment (e.g., cranes) may be required. The delivery of specialized equipment could result in a temporary increase in slower moving traffic volumes on Highway 69 while turning onto the HIWEC entrance.

Table 6-11 identifies potential effects on local interests, land use and infrastructure that could occur during the operations phase of the HIWEC and identifies proposed mitigation strategies.
## Table 6-11: Proposed Mitigation Measures Associated with Potential Effects to Local Interests, Land Use and Infrastructure Resulting from Operations

<table>
<thead>
<tr>
<th>Potential Effect</th>
<th>Performance Objective</th>
<th>Proposed Mitigation Strategy</th>
</tr>
</thead>
</table>
| **Potential Impacts from HIWEC Operations to Lands Available for Traditional Use by Anishinabek People Within the HIWEC Study Area** | • Minimal impact to traditional Anishinabek lands.                                    | • Engage HIFN to ensure exchange of information during operation.  
• Ensure maintenance staff work within pre-determined work areas.  
• Maintain vegetation growth around access roads and WTG foundations.  
• Provide continued site access for authorized persons or a group, which includes HIFN members who use the area for traditional purposes. |
| **Decline in Availability of Country Foods (Traditional Foods) and Medicinal Plants Harvested or Grown For Subsistence or Medical Purposes** | • Minimal decline in availability of country foods and medicinal plants.              | • Mitigation measures proposed in **Section 6.2** to minimize disturbance to wildlife, resource use and recreational use will serve to further reduce impacts to traditional use activities, both on and off-reserve.  
• Develop a site policy for safety and permitted access within the HIWEC on HIFN I.R. #2 regarding traditional uses allowed on the site during operations, i.e., a firearms and/or hunting policy. |
| **Decline in Spiritual, Ceremonial, or Cultural Sites**                          | • Minimal decline in spiritual, ceremonial or cultural sites.                         | • Engage with HIFN staff to ensure exchange of information during maintenance and operation activities.  
• Avoid areas identified by HIFN for spiritual, ceremonial or cultural practices during operational monitoring activities.  
• The HIWEC was selected to avoid or minimize disturbance to areas associated with Aboriginal values important to the community. |
| **Impacts to Nishshing Aki identified by HIFN**                                  | • No impact on Nishshing Aki.                                                        | • Impacts to Nishshing Aki during operations are not anticipated and therefore, no proposed mitigation is required. |
| **Potential For Off-Reserve Impacts to Aboriginal Traditional Rights or Interests Due to the HIWEC** | • Minimal off-Reserve impacts to Aboriginal traditional rights or interests.         | • The HIWEC is proposed entirely on HIFN I.R. #2 within the jurisdiction of HIFN. The community has jurisdiction over land use planning within its territories as part of its authority under the First Nations Land Management Land Code.  
• Mitigation measures proposed in **Section 6.2** to minimize disturbance to wildlife, resource use and recreational use will serve to further reduce impacts to traditional use activities, both on and off-Reserve.  
• Optimize siting of all HIWEC components based on feedback from the community through ATK and constraints discussions.  
• Should potential adverse impacts arise as part of ongoing monitoring, HIW will work with the potentially impacted group to develop avoidance or mitigation as required.  
• HiFN involvement will ensure that the HIWEC respects Aboriginal and treaty rights of HIFN members, many of which are in common with other neighbouring Anishinabek communities. |
| **Potential Impacts to Navigable Waterways Used By Anishinabek Groups**          | • Minimal impacts to navigable waterways used by Anishinabek groups.                | • The HIWEC is proposed entirely on HIFN I.R. #2 within the jurisdiction of HIFN. The community has jurisdiction over land use planning within its territories as part of its authority under the First Nations Land Management Land Code.  
• Mitigation measures proposed in **Section 6.2** to minimize disturbance to wildlife, resource use and recreational use will serve to further reduce impacts to traditional use activities, both on and off-Reserve.  
• Optimize siting of all HIWEC components based on feedback from the community through ATK and constraints discussions.  
• Should potential adverse impacts arise as part of ongoing monitoring, HIW will work with the potentially impacted group to develop avoidance or mitigation as required.  
• HiFN involvement will ensure that the HIWEC respects Aboriginal and treaty rights of HIFN members, many of which are in common with other neighbouring Anishinabek communities. |
| **Access to Trails and Traditional Resource Areas**                              | • Minimal impacts to access of trails and traditional resource areas.                | • Engage with HIFN staff to ensure exchange of information during maintenance and operation activities.  
• Optimize siting of all HIWEC operation phase work to avoid trails and other resource areas based on feedback from the community. |

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Table 6-11: Proposed Mitigation Measures Associated with Potential Effects to Local Interests, Land Use and Infrastructure Resulting from Operations

<table>
<thead>
<tr>
<th>Potential Effect</th>
<th>Performance Objective</th>
<th>Proposed Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Impact Due to Visual Change Within the Vicinity of the HIWEC</td>
<td>Minimize visual change within vicinity of the HIWEC.</td>
<td>Minimize vegetation clearing for the operation of the HIWEC. Limit WTG markings to manufacturer / company markings / logos.</td>
</tr>
<tr>
<td>Negative Impact to the Night Sky Over the Vicinity of the HIWEC</td>
<td>Minimize light emissions from WTGs.</td>
<td>Use red obstruction lighting of 1800 candelas with the beam angle adjusted to minimize lighting observed from ground level. Avoid daytime or white obstruction lighting. Ensure that all lights will flash simultaneously. Design the lighting system such that WTGs within the perimeter of the HIWEC would not be required to be lit if they are within 900 m of a lit WTG, and if they are not the highest WTG in terms of elevation.</td>
</tr>
<tr>
<td>Temporary Change in the Flow of Local Traffic Resulting from Maintenance Activities</td>
<td>Minimize disturbance to local traffic patterns.</td>
<td>Obtain appropriate road occupancy and traffic permits from provincial agencies prior to undertaking maintenance activities, if required. Notify the HIFN community about major HIWEC maintenance activities.</td>
</tr>
</tbody>
</table>
6.7 Public Health and Safety

6.7.1 Existing Conditions

6.7.1.1 Stray Voltage

HIW will ensure that the electrical design conforms and complies with relevant electrical safety standards. Further, the HIWEC collector lines are not anticipated to share poles with existing distribution lines, thereby reducing the instances of potential stray voltage generation. Refer to Section 5 of this Report for more information regarding the Emergency Response and Communications Plan.

6.7.1.2 Structural Hazards

In the unlikely event of structural collapse or blade detachment, equipment will fall within a very small diameter due to the weight of the WTG components. WTG siting for the proposed HIWEC will meet (at a minimum) the setback distances from non-participating residences (550 m) as required by the HIFN EA Guidance document. The nearest WTG to houses located along Bekanon Road will be sited approximately 2 km away.

As discussed in Section 6.6.1.4, property line setbacks are to be assessed in the subsequent Draft Design and Operations Report of the Final Draft EA Report, in accordance with the HIFN EA Guidance document. This requires mapping and a description of the distance between the base of any WTGs and all legal boundaries of the parcel of land on which the WTG is constructed, installed, or expanded within a distance equivalent to the height of the WTG, excluding the length of any blades.

6.7.1.3 Ice Throw

Ice throw and ice shed refer to situations where during specific weather conditions, ice may form on WTGs and may be thrown or break loose and fall to the ground (Chief Medical Officer of Health (CMOH), 2010). WTGs for the proposed HIWEC meet (at a minimum) the setback distances from non-participating residences (550 m) required by the HIFN EA Guidance document. The nearest WTG to houses located along Bekanon Road will be sited approximately 2 km away. During the operation of the HIWEC, sensors located on the WTGs will be able to detect ice build-up and WTGs will be shut down during unsafe operating conditions.

6.7.1.4 Low Frequency Sound, Infrasound and Vibration

WTGs have the potential to emit low frequency sound, infrasound and vibration. Low frequency sound commonly refers to sound at frequencies between 20 and 200 Hertz (Hz); infrasound commonly refers to sound at frequencies below 20 Hz (i.e., below the threshold of human perception). Although generally considered inaudible, infrasound at high-enough sound pressure can be audible to some people (CMOH, 2010). The “Potential Heath Impacts of Wind Turbines Report” (CMOH, 2010) identified that infrasound and low frequency sound from modern WTGs were found to be well below the level where known health effects occur (50 to 70 dB) in studies of WTG noise. Thus, low frequency sound, infrasound and vibration have not been considered in the effects assessment.

6.7.1.5 Electric and Magnetic Fields

Concerns surrounding electromagnetic fields (EMFs) have been raised during consultation processes for other wind energy centres. EMFs are a combination of invisible electric and magnetic fields. They occur both naturally (e.g., light is a natural form of EMF) and as a result of human activity. Nearly all electrical and electronic devices
emit some type of EMF (CMOH, 2010). The generation of electrical fields from any underground electrical collector lines from the HIWEC will be shielded by line insulation and the surrounding ground but will still generate magnetic fields. Associated magnetic fields will be similar to other buried distribution lines in Ontario. The “Potential Heath Impacts of Wind Turbines Report” (CMOH, 2010) indicates that “wind turbines are not considered a significant source of EMF exposure”. Thus, EMFs have not been considered in the effects assessment.

### 6.7.2 Potential Effects and Proposed Mitigation Measures

#### 6.7.2.1 Operations

To minimize or avoid effects on public health and safety, the WTGs are sited according to setback distances as required by the HIFN EA Guidance document and as described in Section 6.7.1.

Table 6-12 identifies potential effects on public health and safety that could occur during the operation phase of the HIWEC and identifies proposed mitigation strategies and a monitoring plan.

<table>
<thead>
<tr>
<th>Potential Effect</th>
<th>Performance Objective</th>
<th>Proposed Mitigation Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts on Public Health and Safety from Structural Hazards, and/or Ice Throw.</td>
<td>• No public health and safety incidents.</td>
<td>• Adhere to setback requirements to limit likelihood of any impacts.</td>
</tr>
<tr>
<td>Stray Voltage Effects to the Public and Wildlife.</td>
<td>• No health and safety incidents associated with stray voltage.</td>
<td>• Build and maintain the HIWEC as prescribed by the Distribution System Code and the Electrical Safety Authority to minimize the risk of stray voltage.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ensure ongoing regular maintenance and monitoring of WTGs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ensure that all electrical design conforms and complies with relevant electrical safety standards.</td>
</tr>
</tbody>
</table>

### 6.8 Other Resources

#### 6.8.1 Existing Conditions

A search for landfills, aggregate resources, forest resources and petroleum resources was undertaken based upon data from HIFN, MOECC and MNRF.

#### 6.8.1.1 Landfills

MOECC’s Landfill Inventory Management Ontario and Large Landfill Sites records (MOECC, 2014a) were used to confirm that there are no landfills within the HIWEC study area – the closest active landfill being approximately 72 km away. Therefore, no effects on landfills are anticipated.

#### 6.8.1.2 Aggregate Resources

Information from MNRF (2015a) was used to confirm that there are no authorized aggregate resources within the HIWEC study area – the closest aggregate resource being approximately 2.14 km away. Therefore, no effects on aggregate resources are anticipated. A final location of the source of the required aggregate will be determined.
prior to construction, however it is planned that aggregate materials required for concrete will be obtained from local aggregate sources in the vicinity of HIFN I.R. #2.

### 6.8.1.3 Forest Resources

Based on the MNRF’s Sustainable Forest Licences (SFL) database (MNRF, 2014), there is one SFL within the HIWEC study area, held by the non-profit organization Westwind Forest Stewardship Inc. (Westwind). This SFL does not include jurisdiction of any forest resources within the boundaries of HIFN I.R. #2. Under the SFL, Westwind maintains the French-Severn Forest which encompasses approximately 885,000 ha of public land bordering Georgian Bay to the west, Algonquin Park to the east, the French and Severn Rivers to the north and south. Westwind developed the 2009-2019 French-Severn Forest Management Plan which is required to operate in a Crown forest and acts as a strategy to maintain a healthy and productive forest (Westwind Forestry Management, 2009). No effects on this SFL are anticipated as it is outside the footprint of the facility.

### 6.8.1.4 Petroleum Resources

Based on MNRF’s Oil, Gas & Salt Resources (OGSR) library (OGSR, 2011), there are no petroleum wells within the HIWEC study area or within 75 m of HIWEC components. Therefore, no effects on petroleum resources are anticipated.

### 6.9 Areas Protected under Provincial Plans and Policies

The HIFN EA Guidance document requires a determination as to whether the HIWEC is being proposed in any of the following protected or plan areas:

- Protected Countryside or Natural Heritage Systems in the Greenbelt Plan;
- Oak Ridges Moraine Conservation Plan Areas;
- Niagara Escarpment Plan Area; or
- Lake Simcoe Watershed Plan Area.

The HIWEC is not proposed in an area within the jurisdiction of the plans noted above. As such, there will be no effects on these areas as a result of the HIWEC.
7. References

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