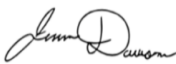


CarbonFree Fort Frances Project
Design and Operations Report

H375736-0000-840-066-0006

					
2026-06-16	2	Approved for Use	J. Dawson	C. Sehl	S. Thompson
2026-04-01	1	Approved for Use	J. Dawson	C. Sehl	S. Thompson
2026-03-23	0	Approved for Use	J. Dawson	C. Sehl	S. Thompson
DATE	REV.	STATUS	PREPARED BY	CHECKED BY	APPROVED BY
				Discipline Lead	Functional Manager

IMPORTANT NOTICE TO READER

This report has been prepared by Hatch Ltd. (Hatch) for the sole and exclusive use of CarbonFree Fort Frances Ltd. (the "Client") for the purpose of assisting the Client in making decisions with respect to the development of a proposed solar photovoltaic project and shall not be (a) used for any other purpose, or (b) provided to, relied upon or used by any third party.

This report contains opinions, conclusions and recommendations made by Hatch, using its professional judgment and reasonable care. Any use of or reliance upon this report by the Client is subject to the following conditions:

1. the report being read in the context of and subject to the terms of the agreement between Hatch and the Client including any methodologies, procedures, techniques, assumptions and other relevant terms or conditions that were specified or agreed therein;
2. the report being read as a whole, with sections or parts hereof read or relied upon in context;
3. the conditions of the Project Location may change over time (or may have already changed) due to natural forces or human intervention, and Hatch takes no responsibility for the impact that such changes may have on the accuracy or validity of the observations, conclusions and recommendations set out in this report; and
4. the report is based on information made available to Hatch by the Client or by certain third parties; and unless stated otherwise in the Agreement, Hatch has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith.

Table of Concordance

The following concordance table cross-references the contents of this Design and Operations Report with each requirement identified in O. Reg. 359/09 so that the required information can be easily found within this report.

Requirements	Report Section
1. Set out a site plan of the project location at which the renewable energy project will be engaged in, including, i. one or more maps or diagrams of, A. all buildings, structures, roads, utility corridors, rights of way and easements required in respect of the renewable energy generation facility and situated within 300 m of the facility, B. any ground water and surface water supplies used at the facility, C. any things from which contaminants are discharged into the air, D. any works for the collection, transmission, treatment and disposal of sewage, E. any areas where waste, biomass, source separated organics and farm material are stored, handled, processed or disposed of, F. the project location in relation to any of the following within 125 m: properties described in Column 1 of the Table to section 19, heritage resources, archaeological resources, the portion of the Oak Ridges Moraine Conservation Plan Area that is subject to the Oak Ridges Moraine Conservation Plan, the area of the Niagara Escarpment Plan, the Protected Countryside, the Lake Simcoe watershed, and G. any noise receptors or odour receptors that may be negatively affected by the use or operation of the facility, ii. a description of each item diagrammed under subparagraph i, and iii. one or more maps or diagrams of land contours, surface water drainage and any of the following, if they have been identified in complying with this Regulation: properties described in Column 1 of the Table to section 19, heritage resources, archaeological resources, water bodies, significant or provincially significant natural features and any other natural features identified in the Protected Countryside or in the portion of the Oak Ridges Moraine Conservation Plan Area that is subject to the Oak Ridges Moraine Plan.	Section 2 and Appendix A
2. Set out conceptual plans, specifications and descriptions related to the design of the renewable energy generation facility, including a description of, i. any works for the collection, transmission, treatment and disposal of sewage, including details of any sediment control features and storm water management facilities, ii. any things from which contaminants are discharged into the air, and iii. any systems, facilities and equipment for receiving, handling, storing and processing any waste, biomass, source separated organics, farm material and biogas.	Table 2-1

Requirements	Report Section
3. Set out conceptual plans, specifications and descriptions related to the operation of the renewable energy generation facility, including, i. in respect of any water takings, A. a description of the time period and duration of water takings expected to be associated with the operation of the facility, B. a description of the expected water takings, including rates, amounts and an assessment of the availability of water to meet the expected demand, and C. an assessment of and documentation showing the potential for the facility to interfere with existing uses of the water expected to be taken, ii. a description of the expected quantity of sewage produced and the expected quality of that sewage at the project location and the manner in which it will be disposed of, including details of any sediment control features and storm water management facilities, iii. a description of any expected concentration of air contaminants discharged from the facility, iv. in respect of any biomass, source separated organics and farm material at the facility, A. the maximum daily quantity that will be accepted, B. the estimated annual average quantity that will be accepted, C. the estimated average time that it will remain at the facility, and D. the estimated average rate at which it will be used, and v. in respect of any waste generated as a result of processes at the project location, the management and disposal of such waste, including A. the expected types of waste to be generated, B. the estimated maximum daily quantity of waste to be generated, by type, C. processes for the storage of waste, and D. processes for final disposal of waste.	Sections 3 to 5
4. Include an environmental effects monitoring plan in respect of any negative environmental effects that may result from engaging in the renewable energy project, setting out, i. performance objectives in respect of the negative environmental effects, ii. mitigation measures to assist in achieving the performance objectives mentioned in subparagraph i, iii. a program for monitoring negative environmental effects for the duration of the time that the project is engaged in, including a contingency plan to be implemented if any mitigation measures fail.	Section 5

Requirements	Report Section
5. Include a response plan setting out a description of the actions to be taken while engaging in the renewable energy project to inform the public, aboriginal communities and municipalities, local roads boards and Local Services Boards with respect to the project, including, i. measures to provide information regarding the activities occurring at the project location, including emergencies, ii. means by which persons responsible for engaging in the project may be contacted, and iii. means by which correspondence directed to the persons responsible for engaging in the project will be recorded and addressed.	Section 6
6. If the project location is in the Lake Simcoe watershed, a description of whether the project requires alteration of the shore of Lake Simcoe, the shore of a fresh water estuary of a stream connected to Lake Simcoe or other lakes or any permanent or intermittent stream and, i. how the project may impact any shoreline, including the ecological functions of the shoreline, and ii. how the project will be engaged in to, A. maintain the natural contour of the shoreline through the implementation of natural shoreline treatments, such as planting of natural vegetation and bioengineering, and B. use a vegetative riparian area, unless the project location is used for agricultural purposes and will continue to be used for such purposes.	Not Applicable
7. If it is determined that the project location is not on a property described in Column 1 of the Table to section 19, provide a summary of the matters addressed in making the determination.	Not Applicable
8. If section 20 applies in respect of the project and it is determined that the project location does not meet one of the descriptions set out in subsection 20 (2) or that the project location is not in an area described in subsection 20 (3), provide a summary of the matters addressed in making the determination.	Not Applicable
9. If subsection 21 (3) or 23 (2) applies, provide a summary of the matters addressed in making the determination, i. under subsection 21 (3) or clause 23 (2) (a), as the case may be, including a copy of the document completed under the applicable provision, and ii. under clause 23 (3) (b), if applicable.	Not Applicable

Table of Contents

Table of Concordance	ii
Table of Acronyms	vii
Executive Summary	ES-1
1. Introduction	1
1.1 Background	1
1.2 Renewable Energy Approval Legislative Requirements	1
1.3 Purpose of Report	1
2. Site Plan	2
2.1 Site Plan Components	2
2.2 Supporting Reports	5
3. Facility Design Plan	5
3.1 Facility Components Overview	5
3.1.1 Access Roads	6
3.1.2 Fencing and Security	6
3.1.3 Laydown Area	6
3.1.4 Inverter Building and Electrical Equipment Foundations	6
3.1.5 PV Module Structural Support	6
3.1.6 Surface Drainage System	6
3.1.7 Electrical Equipment	7
3.1.8 Stormwater Management/Erosion and Sediment Control	8
3.1.9 Water Supply Facilities	9
3.1.10 Wastewater (Sewage) Facilities	9
3.1.11 Waste Disposal Facilities	9
3.1.12 Exhaust Equipment	9
4. Facility Operations Plan	10
4.1 Operations	10
4.2 Site Maintenance and Inspection	10
4.2.1 Planned Maintenance	10
4.2.2 Unplanned Maintenance	11
5. Environmental Effects Monitoring Plan	12
5.1 Environmental Effects and Mitigation Measures	12
5.2 Monitoring Plan	13

6. Emergency Response and Communications Plan.....	19
6.1 Emergency Response	19
6.1.1 Fire.....	19
6.1.2 Personal Injury.....	19
6.1.3 Spills	20
6.2 Non-Emergency Communications.....	21
7. References	22

List of Tables

Table 2-1: Site Plan Components and Additional Information.....	2
Table 2-2: General Reference Documents.....	5
Table 5-1: Environmental Effects Analysis Criteria	12
Table 5-2: Summary of Potential Negative Effects and Proposed Mitigation – Operation Phase.....	14
Table 5-3: Environmental Effects Monitoring Plan – Operation Phase	17

List of Appendices

Appendix A Site Layout

Appendix B Stormwater Management Plan

Table of Acronyms

AC	Alternating Current
ANSI	Areas of Natural and Scientific Interest
cSWH	Candidate Significant Wildlife Habitat
DC	Direct Current
ESC	Erosion and Sediment Control
H&S	Health and Safety
HONI	Hydro One Networks Inc.
kg	Kilogram
km	Kilometre
kV	Kilovolt
kW	Kilowatt
m	Metre
MECP	Ministry of the Environment, Conservation and Parks
mm	Millimetre
MVA	Megavolt-ampere
MW	Megawatt
NHA	Natural Heritage Assessment
O. Reg.	Ontario Regulation
PCS	Power Conversion System
PDR	Project Description Report
PV	Photovoltaic
REA	Renewable Energy Approval
ROW	Right-of-Way
SAC	Spills Action Centre
SCADA	Supervisory Control and Data Acquisition
SoCC	Species of Conservation Concern
SWH	Significant Wildlife Habitat
W	Watt

Executive Summary

The CarbonFree Fort Frances Project is a proposed 167 megawatt (MW) Class 3 solar photovoltaic (PV) facility located approximately 7.5 kilometres (km) northwest of Fort Frances in the unincorporated township of Miscampbell. The project is designed to support Ontario's increasing demand for renewable energy by converting sunlight into electricity using approximately 346,008 solar modules, with power stepped up through a distributed system of inverter-transformer units and delivered to the existing 230 kilovolt (kV) Hydro One transmission line. As required under Ontario Regulation 359/09 for Renewable Energy Approvals (REA), this Design and Operations Report outlines the project's site layout, facility components, operational procedures, environmental protection measures, and emergency response planning. The report builds on the Project Description Report by defining the location and design of infrastructure, detailing how the facility will be operated, and describing the strategies that will be used to mitigate environmental effects throughout its lifecycle.

The project area consists primarily of agricultural lands, pasture, and regenerating forest, with surrounding land use within 300 metres (m) dominated by rural residential properties and farmland. Within and near the project boundary are wetlands, watercourses, and candidate Significant Wildlife Habitat, all of which have informed setbacks and design refinements. A series of maps included in the supporting appendices illustrate project components alongside natural features, surface drainage, contours, land uses, and nearby noise receptors. The facility components include three large PV arrays, 39 inverter-transformer units, a high-voltage substation, and a network of underground and overhead electrical cabling. Access to the site will be provided through both temporary and permanent roads connecting to nearby municipal roads, with all road construction designed to maintain existing surface drainage patterns. The project requires no on-site sewage, water supply, waste processing, or air-emitting equipment, as the solar facility does not generate wastewater, industrial emissions, or process-related waste. A stormwater management plan will guide grading, drainage, and infiltration practices to avoid erosion, sedimentation, or downstream impacts.

During operations, the facility will be remotely monitored and visited periodically by maintenance staff. Routine activities will include inspections of PV modules, inverters, transformers, vegetation, drainage features, and security systems. Vegetation beneath and around the panels will be maintained through mowing or grazing, minimizing the need for herbicides except for targeted invasive species control. Waste generated during maintenance (primarily packaging, broken equipment components, and miscellaneous debris) will be collected in on-site bins and removed by licensed waste haulers. No hazardous chemicals are used in electricity generation, and water for occasional panel cleaning will be sourced off-site if natural rainfall is insufficient. Noise levels from inverters and transformers are expected to comply with applicable provincial standards; where needed, noise barriers will be installed, and a complaint-response process will be available to nearby residents.

A comprehensive assessment of potential environmental effects has been completed to address soils, vegetation, wildlife, water resources, noise, dust, and socio-economic considerations. Mitigation measures have been incorporated into the project design, including setbacks from wetlands and waterbodies, erosion and sediment controls, spill prevention procedures, restrictions on vegetation clearing to avoid wildlife-sensitive periods, and the maintenance of natural drainage patterns. These measures are expected to reduce all residual effects to low or negligible levels. Monitoring throughout construction and operation will rely on regular visual inspections of vegetation, drainage, erosion controls, spill-prevention measures, and wildlife interactions, supported by internal reporting systems and adaptive management where unforeseen effects occur. Incidental wildlife encounters, spills, or erosion issues will be documented and addressed promptly, with mandatory reporting to regulatory agencies when required.

An Emergency Response and Communications Plan will guide actions in the event of fire, spills, or personal injury. All personnel will be trained in emergency procedures, and the site will be equipped with spill kits, fire extinguishers, and appropriate safety signage. A sign at the facility entrance will provide a 24-hour project contact number for public inquiries or complaints, which will be tracked through an electronic log and responded to promptly. Non-emergency communications, including regulatory notifications, public updates, and correspondence with local authorities, will be maintained throughout the project's lifecycle.

Overall, the CarbonFree Fort Frances Project has been planned to meet provincial regulatory requirements while minimizing environmental impacts, ensuring safe and reliable operations, and contributing significantly to Ontario's renewable energy supply. With appropriate mitigation, monitoring, and emergency response procedures in place, the project is expected to operate with minimal adverse effects on the surrounding environment and community while delivering long-term clean energy benefits.

1. Introduction

1.1 Background

CarbonFree Fort Frances Ltd. (CarbonFree) is proposing to develop a 167 megawatt (MW) Class 3 solar photovoltaic (PV) project adjacent to Highway 611 in the unincorporated township of Miscampbell, approximately 7.5 kilometres (km) northwest of Fort Frances.

The proposed CarbonFree Fort Frances Project (hereinafter referred to as the Project) is a renewable energy generation facility which will use solar PV technology to generate electricity. Electricity generated by solar PV panels will be converted from direct current (DC) to alternating current (AC) by inverters and then stepped up (via pad-mounted inverters, medium-voltage transformers and a main substation transformer) to 230 kilovolts (kV) prior to being connected to the existing Hydro One Networks Inc. (HONI) transmission line.

The Project aims to contribute to the government of Ontario's goal of accelerating new electricity generation from renewable sources to support the province's growing energy needs. Accordingly, CarbonFree intends to enter into an agreement for the sale or supply of electricity, the quantity of which will be commensurate with the nameplate capacity of the facility.

1.2 Renewable Energy Approval Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – Renewable Energy Approvals Under Part V.0.1 of the Act, (herein referred to as the REA Regulation), came into force on September 24, 2009, and establishes the Renewable Energy Approval (REA) requirements for renewable energy generation facilities in Ontario. In accordance with REA Regulation (Part II, Section 4), ground-mounted solar facilities with a nameplate capacity greater than 10 kilowatts (kW) are classified as Class 3 solar facilities and require a REA.

Section 13 of the REA Regulation further requires proponents of Class 3 solar facilities to complete a Design and Operations Report, which includes the site plan, facility design, operational details, and measures for monitoring and mitigating environmental effects. For more information, the Table of Concordance provides a summary of these requirements and cross-references where each item is addressed in this report.

1.3 Purpose of Report

The Design and Operations Report is a key component of the REA application and serves as the principal document outlining the details of the Project. It builds on the Project Description Report (PDR) by defining:

- The site plan.
- The design of the facility and the equipment to be used.
- How the facility will be operated.

- How environmental effects will be monitored and mitigated.
- How emergencies and communications will be managed.

Additionally, the Design and Operations Report acts as a tool for public and Indigenous consultation.

2. Site Plan

A detailed site plan of the proposed project facilities referenced throughout this report is provided in Appendix A (Figure A1). Additional details regarding the site plan are presented in Table 2-1 below.

2.1 Site Plan Components

The site plan components and additional information is provided in Table 2-1.

Table 2-1: Site Plan Components and Additional Information

Components	Additional Information and Site Plan Reference
Facility Components	
Buildings or Structures	The following are shown in Figure A1 (Appendix A): • Approximately 346,008 solar panels, each 625 watts (W), grouped into three arrays. • Switching station. • Substation and substation yard. • Transformers.
Access Roads and Fencing	The following are shown in Figure A1 (Appendix A): • Fence line (which follows the property boundary). • Access roads.
Electrical Equipment	The following are shown in Figure A1 (Appendix A): • Solar PV Modules: 346,008 units, each 625 W, approximately 33 kilograms (kg), dimensions 2,382 millimetres (mm) x 1,134 mm x 30 mm. • Inverters: 4.4 MW AC units converting DC from PV modules to AC. • Transformers: 39 pad-mounted 4.4 megavolt-ampere (MVA), 3-phase, liquid-filled units stepping voltage to 34.5 kV; each paired with one inverter. • Substation Yard: Gravel yard housing approximately 186 MVA transformer (34.5 kV to 230 kV), switchgear, control/monitoring equipment, and communication tower. Underground and overhead medium-voltage transmission lines, DC cabling, and AC cabling are not shown in the figures.
Utility Corridors, Rights-of-Way (ROWs), or Easements	Ongoing consultation is being completed with the private landowners, HONI, Ministry of Transportation, and Northern Municipal Services Office to determine the siting private easements as well as the public encroachments and entrance permits required to facilitate the Project. Private easements are expected to be required to support electrical connections over Highway 611, Kliner Road and McFee Road. Public encroachments along municipal and provincial road ROWs, as well as entrance permits, will also be required to connect sections of the Project. No utility corridors or ROWs are required for this Project.

Components	Additional Information and Site Plan Reference
Laydown Area	A construction laydown area will occur on the Project Location, adjacent to where the solar PV arrays and substation are installed.
Other Facility Components (Process Features)	
Water Supply Facilities: Groundwater and Surface Water	The Project does not require any on-site facilities to supply groundwater (wells) or surface water (ponds, watercourses) for operation of the Project.
Wastewater (Sewage) Facilities	The Project will not generate any wastewater (sewage) or discharge any liquid effluent from its operation, nor does the Project require any on-site facilities for the collection, transmission, treatment, or disposal of wastewater for operation of the Project. During operation, sanitary facilities (e.g., permanent washrooms with a septic disposal system) are not required. If sanitary facilities are determined to be required, portable toilets, provided and serviced by a local sanitation company, will be used.
Stormwater Management	A stormwater management design has been developed to minimize any potential negative environmental effects to existing drainage conditions (e.g., increased runoff, erosion, or sedimentation) such that they do not occur as a result of the Project. The stormwater management plan is attached in Appendix B. Following construction, the entire Project Location, with the exception of the access roads, will be re-vegetated with native grass or other suitable ground cover to promote surface water infiltration, filter stormwater runoff and to prevent erosion. A more detailed analysis of findings is discussed in the Stormwater Management Plan.
Drainage	The Project's proposed design adds localized hard surfaces (PV modules) but keeps the natural drainage system functioning as before, with no meaningful change to the main runoff pathways established by the existing topography. A more detailed analysis of findings is discussed in the Stormwater Management Plan.
Discharge of Contaminants to Air	The Project has no facilities or equipment that will discharge contaminants or pollutants to the air during normal operations of the Project.
Waste Management Equipment	No waste management equipment or facilities are required for the Project. Trash, debris, and equipment parts replaced during maintenance and repair activities will be collected and properly stored in waste disposal bins. All waste collected during operation of the Project will be removed in accordance with provincial and local requirements.
Existing Features within 300 metres (m) of the Project Location	
Buildings or Structures	Buildings are primarily residential and commercial located along Highway 611, Frog Creek Road, and Burris Road East.
Municipal Roads	Public roads are shown in Figure A1 in Appendix A. These roads include: • Frog Creek Road • Highway 611 • McFee Road • Kliner Road • Hayes Road.
Utility Corridors, Rights-of-Way (ROWs), and Easements	The HONI transmission line is shown in Figure A1 (Appendix A).

Components	Additional Information and Site Plan Reference
Groundwater Wells	Existing groundwater wells were not identified in the Ministry of the Environment, Conservation and Parks (MECP) Water Well Records database (2024).
Topographical Land Contours	Land contours are shown in Figure A1 (Appendix A).
Surface Water Drainage	Drainage features are shown in Figure A1 (Appendix A) and further discussed in the Water Body Assessment Report.
Natural Heritage Features	The Project Location is primarily on disturbed pasture, agricultural lands, and regenerative forest habitats. The Project Location is generally characterized as having an abundance of grassland, meadow, and prairie habitat that are utilized as pasturelands for cattle, hay production, and annual row crops. The Natural Heritage Assessment (NHA) identified wetlands and candidate Significant Wildlife Habitat (cSWH) that have prescribed setbacks for protection. Wetland and vegetation features are displayed in Figure A1 (Appendix A). Overall, the Project has been sited to avoid sensitive natural features, where possible. Mitigation efforts have been planned for the construction phasing. A more detailed analysis of findings is discussed in the NHA.
Land Use	The primary existing land use within the Project location is agricultural and pasture. Surrounding land uses found within 300 m of the Project location are primarily agriculture and undeveloped forested areas.
Provincial Policy Areas	The Project is not located within 300 m of the Oak Ridges Moraine Conservation Plan Area, Niagara Escarpment Plan Area, Greenbelt Plan Area, the Protected Countryside, or Lake Simcoe Watershed.
Noise Considerations	
Noise Receptors	Noise receptors are shown in Figure A1 (Appendix A). More information regarding the noise receptors can be found in the Acoustic Assessment Report.
Inverters, Inverter Step-Up Transformer and Main Power, and Transformer	The dominant noise sources for the Project are as follows: - Panel Arrays: 0.04 kWh per tracker motor and considered insignificant community noise emission sources. - Inverter - Transformer Power Conversion System: 4.4 MW AC inverters convert the DC supplied by the PV modules to AC. A 4.4 MVA, 3-phase, liquid-filled transformer will then 'step up' the voltage to 34.5 kV. Noise from the power conversion system (PCS) inverter comes from its air cooling fans while noise from its medium-voltage transformer is largely from the magnetostriction hum. - Switchgear: Control panel cooling fans are small and are located indoors. Therefore, the switchgears are considered insignificant community noise emission sources. - Substation Transformer: A 186 MVA transformer that will 'step up' the voltage from 34.5 kV to 230 kV. The substation transformer noise has a magnetostriction hum.
Demonstration of Compliance with Setbacks	
Project Location Boundary	The outer limit of all Project components, including temporary laydown areas during construction works, is shown in Figure A1 (Appendix A).
Protected Properties	No protected properties were identified within 300 m of the Project Location.
Heritage Resources	None of the properties located within 300 m of the Project Location contained criteria that would necessitate further action in the form of a Cultural Heritage Evaluation Report. For a more detailed assessment, see the Cultural Heritage Evaluation.

Components	Additional Information and Site Plan Reference
Archaeological Resources	No archaeological resources were identified within 300 m of the Project Location. Should any alteration to the plans of the development occur, additional archaeological assessment may be required. For a more detailed assessment, see the Stage 1 and Stage 2 Archaeological Assessment.
Waterbodies	Waterbodies identified within 300 m of the Project Location are displayed in Figure A1 (Appendix A).
Significant or Provincially Significant Natural Features	No significant or provincially significant features were identified within the Project Location.

2.2 Supporting Reports

This report references supporting documents noted in Table 2-2 below, which are available on the Project website: [CarbonFree Fort Frances](#).

Table 2-2: General Reference Documents

Document Title
Acoustic Assessment Report
Construction Plan Report
Cultural Heritage Evaluation
Decommissioning Plan Report
Natural Heritage Assessment
Project Description Report
Sediment and Erosion Control Plan
Stage 1 and Stage 2 Archaeological Assessment
Stormwater Management Plan
Water Body Assessment Report

3. Facility Design Plan

The following section describes the principal facility components that will be used during the operation of the Project. At this stage in the Project, the specific make, model and dimensions of the various electrical equipment have not been finalized. Where applicable, typical sizes and descriptions of how the various components operate have been provided.

Information describing how these components will be constructed and installed in the Project, and the potential related environment effects and mitigation measures is provided in the Construction Plan Report.

3.1 Facility Components Overview

The Project is located adjacent to Highway 611 in the unincorporated township of Miscampbell, approximately 7.5 km northwest of Fort Frances (see Appendix A). The Facility is designed to operate 24 hours a day, 7 days a week.

No equipment in the facility design relates to groundwater and surface water supplies, air discharges, and/or water and biomass management.

3.1.1 Access Roads

Up to five permanent access roads will be constructed, with entrances from Frog Creek Road, Highway 611, McFee Road, Kliner Road, and Hayes Road. Roads will be approximately 6 m wide and constructed of crushed gravel. Ditches and culverts will be constructed, if necessary, to maintain site drainage.

In addition to these temporary and permanent primary access roads, there will be several internal access roads. These roads will be 3 to 6 m in width and will follow property lines or field boundaries to the extent possible.

3.1.2 Fencing and Security

The Project Location will be gated and fenced to prevent unauthorized access. The fence design includes a chain-link fence, approximately 2 m high, and topped with barbed wire. Signage will be posted identifying the facility as a solar project on private land. Additional security measures may be installed such as task or motion-sensor lighting, and/or security cameras.

3.1.3 Laydown Area

One construction laydown area will be developed on the property. The laydown area will be cleared of vegetation and topsoil may be removed and stockpiled for later re-use during site restoration. Selected areas will then be laid with compacted gravel.

The laydown area will be used as a truck unloading and loading area and to temporarily store various machinery, equipment and materials needed for construction. It will also include fuel and waste storage areas, and modular office and washroom trailers.

3.1.4 Inverter Building and Electrical Equipment Foundations

Foundations will be required beneath transformers and inverters. Foundation construction for electrical equipment comprises of excavation and removal of surface materials (topsoil will be stockpiled for later reuse during site restoration), placement of granular material, formwork, reinforcing steel, grounding, and placement of cast-in-place concrete pads.

3.1.5 PV Module Structural Support

The PV modules will be mounted on single axis trackers. The trackers will be supported by steel posts which are founded in either concrete slab-on-grade, or foundations buried in the ground to a depth below the frost line.

3.1.6 Surface Drainage System

Alterations to land topography will be limited to minor grading as required. Surface runoff will be directed to existing drainage systems (e.g., roadside ditches). Accordingly, alterations to the existing surface drainage patterns are not expected as part of the construction and of the Project. This will ensure productivity of the agricultural land is maintained.

3.1.7 *Electrical Equipment*

3.1.7.1 *Solar PV Modules*

The Project will include approximately 346,008 solar PV modules grouped into three arrays, each array isolated by its own switchgear. The panels are routed into 39 SunGrow SG4400, 4.4 MVA inverter/transformer modules spread across the three arrays. Each switchgear feeds the proposed high-voltage substation located to the north of the facility. The PV panels will be installed on racks mounted on tracking structures. The tracking structures are expected to be supported by steel piles, driven or screwed into the ground. Where necessary, these foundations may be supported by concrete. Tracking structures are expected to be oriented to the north-south, tracking the sun movement from east to west. Each tracker will typically have approximately 50 PV modules connected by electrical wiring. The racks of modules will be arranged in long rows, typically spaced about 6 m apart east to west. The DC electrical current from the solar PV modules will be transmitted across the back of the modules and through underground wires connected to combiner boxes.



Figure 3-1: Typical View of PV, Tracker Setup¹

3.1.7.2 *Electrical System and Trenching Requirements*

A network of underground DC cabling will be required from the termination point of each PV array at combiner boxes to the inverters and medium-voltage transformers. The inverters convert the DC electricity to AC and the transformers step up the voltage to 34.5 kV. A network of overhead and underground AC cables will be required to transmit the AC current to the main transformer situated in the substation yard and will then flow through overhead electrical lines to the existing HONI transmission system.

Electrical cables will be buried below grade, in accordance with the Ontario Electrical Safety Code. A simple trenching device will be used to install the underground cables, whereby a slot is opened, the cable laid with sand above and below, and the excavated soil replaced.

¹ Example image sourced from Hatch.

Where necessary, and as approved by the electrical safety code, conduits will be used to house and protect the electrical cabling.

3.1.7.3 *Substation*

The main substation transformer will be located in the substation yard at the northern extent of the parcel west adjacent Highway 611 (presented in Figure A1, Appendix A). The substation transformer is liquid-fuelled, used for stepping up the voltage from 34.5 kV to 230 kV prior to connecting to the existing HONI 230 kV transmission line north of Hayes Road. The substation transformer containment system will be an oil-retention pit type consisting of the following features:

- A reinforced concrete raft foundation filled with crushed stone designed to absorb a combined volume of 110% transformer oil volume plus the 24-hour duration, 1-in-50-year return storm under normal operation conditions.
- Containment walls that are 0.3 m higher than top of finished grade and top of crushed stone filled inside pit.
- Slope slab surface that drains towards the sump pit.

Transformers will use mineral oils or FR3 oils, which are non-toxic, non-bioaccumulating and readily biodegradable in the environment. All transformers will be routinely inspected and any faulty equipment that could result in an oil leak will be repaired. Secondary containment for the transformer substation has been incorporated into the substation design.

3.1.7.4 *Noise Generating Equipment*

Noise generating equipment during the operation of the Project is expected to be limited to inverters and transformers adjacent to the solar PV arrays and within the substation. Minor noise may be generated by tracker motors at intervals throughout the day. An Acoustic Assessment Report study has been completed to review proposed locations of noise-emitting equipment to confirm the applicable MECF and NPC-300 noise levels will not be exceeded during operation.

3.1.8 ***Stormwater Management/Erosion and Sediment Control***

A preliminary stormwater management plan has been prepared to minimize the potential for negative effects to the existing drainage conditions. The stormwater management plan also includes erosion and sediment control (ESC) measures to prevent downstream sedimentation. The proposed minimum ESCs to be installed are detailed in Appendix B and can be summarized as follows:

- **Short-Term (Construction) Measures**
 - ◆ Silt fence and flow-control barriers.
 - ◆ Stabilized construction entrance.
 - ◆ Stockpile covering/stabilization.

- ♦ Temporary berms and erosion blankets.
- ♦ Limit equipment to work zones.
- ♦ Daily inspections of control measures and quick repairs as needed.
- **Long-Term (Post-Construction) Measures**
 - ♦ Permanent vegetation establishment.
 - ♦ Maintain vegetated buffers.
 - ♦ One-year post-construction review.
 - ♦ Replanting or regrading if erosion persists.

3.1.9 Water Supply Facilities

The Project does not require any on-site facilities to supply groundwater (wells) or surface water (ponds, watercourses) for operation of the Project. It is anticipated that water from rain and snow will be sufficient for cleaning the solar PV modules and maintaining vegetative cover on-site; if not, the Proponent will contact local suppliers to provide water in tankers from off-site sources for this purpose. No chemicals will be used in the cleaning of the PV modules.

3.1.10 Wastewater (Sewage) Facilities

The Project will not generate any wastewater (sewage) or discharge any liquid effluent from its operation, nor does the Project require any on-site facilities for the collection, transmission, treatment or disposal of wastewater for operation of the Project.

During operation, sanitary facilities (e.g., permanent washrooms with a septic disposal system) are not required. If sanitary facilities are determined to be required, portable toilets, provided and serviced by a local sanitation company, will be used.

3.1.11 Waste Disposal Facilities

The Project will not generate significant quantities of waste from its operation. Small waste disposal bin(s) will be provided on-site to collect any trash, debris, or equipment parts replaced during routine maintenance of the Project during its operation. Periodically, when required, the Proponent will arrange for a licensed waste disposal company to empty the bins and haul the waste to an appropriate waste disposal facility off-site.

3.1.12 Exhaust Equipment

The Project has no facilities or equipment that will discharge contaminants or pollutants into the air during normal operations of the Project.

4. Facility Operations Plan

4.1 Operations

The Project will operate year-round and generate electricity during daylight hours. The amount of power generated will depend on daily weather conditions and sufficient solar irradiation. The Project will be operated remotely. A permanent workforce is not expected to be required on-site with the exception of maintenance and inspection staff or security personnel (as needed). To ensure the safety and integrity of the Project, access will be limited to Project personnel and unauthorized public access will be prevented by fences, gates and security procedures.

Operationally, there are no significant hazards involved in the operation of the Project, nor are hazardous materials stored on-site or created by the Project during its operation. The Project will not generate significant quantities of waste from its operation.

4.2 Site Maintenance and Inspection

4.2.1 *Planned Maintenance*

4.2.1.1 *Solar PV Modules*

The Project solar PV modules, inverters and transformers, and other electrical equipment, wiring and electrical connections will be routinely inspected, typically monthly. Any broken or malfunctioning PV modules, electrical cabling or components will be repaired or replaced by facility staff. Trash, debris and equipment parts replaced during maintenance and repair activities will be collected and properly stored in waste disposal bins. All waste collected during operation of the Project will be removed in accordance with provincial and local requirements.

The need to clean the solar PV modules will be determined according to local weather conditions, such as the quantity and frequency of rain and snow at the Project Location. At the very most, it is expected that the modules will require cleaning quarterly, but it is possible that cleaning the modules will not be necessary at all. If required, water trucks will bring water to supply the water required. No chemicals will be used for the cleaning of the modules.

4.2.1.2 *Vegetation*

Vegetative ground cover, drainage systems and trees will be routinely monitored and maintained, with inspection frequency varying seasonally. In general, monthly inspections from approximately April through October are anticipated, with more limited winter inspections due to potential access constraints from snow cover.

Since suitable ground cover will be established under the PV modules, some form of vegetation abatement such as grass cutting may be required several times throughout the summer months and may extend outside of the fenced project area to maintain the fence line of the Project. No hazardous chemicals are expected to be used for regular maintenance or vegetation abatement activities and will only be considered for management of invasive

species, where present. Limited and targeted use of herbicides will be applied by a licensed exterminator in accordance with the Pesticides Act, R.S.O. 1990, c. P.11 and O. Reg. 63/09 and will be used in accordance with the approved label for the product, along with standard mitigation measures for the herbicide.

4.2.1.3 *Drainage*

The Project Location, including any drainage features (e.g., grassed swales, culverts) and any sediment and erosion control measures (e.g., riprap protection, rock flow checks) will be visually inspected for any signs of erosion or sedimentation and recorded. Regular maintenance such as the cleanout of accumulated sediment and/or the removal of any debris blockage would be conducted at that time. If required, remedial works (e.g., stabilizing and/or reseeding of identified erosion areas) and repairs to any drainage features or sediment and erosion control measures will be implemented to minimize environmental impacts.

4.2.1.4 *Transformers*

The transformers will be visually inspected on a quarterly basis and their status recorded. Any faulty equipment that could result in an oil leak will be repaired and any observed leaks will be cleaned up immediately by maintenance personnel. Secondary containment will be integrated into the design of the substation and will have the capacity to hold 110% of the mineral oil utilized in the transformer system. Transformer stations will be connected to a supervisory control and data acquisition (SCADA) system that logs and communicates alarms in real time. Transformers will be monitored for oil levels, oil pressure, oil temperature, and gas accumulations to alert operators to faults so as identify potential issues or leaks. Spill response equipment will be left on-site or in the maintenance trucks should leaks be observed.

4.2.2 ***Unplanned Maintenance***

In addition to scheduled maintenance activities, CarbonFree is prepared to address any unplanned maintenance that may be required for the Project. The following outlines CarbonFree's approach:

- Unplanned maintenance activities will be conducted on an as-needed basis, determined by the severity of the issue and the urgency of required repairs.
- Unplanned maintenance may occur at any time throughout the year.
- All work will be performed by qualified personnel following applicable safety standards, procedures, and regulatory requirements.
- Activities may include the repair or replacement of equipment, with the specific scope dependent on the nature and extent of the issue.
- CarbonFree will maintain an inventory of spare parts in a secure location to minimize repair timelines associated with unplanned issues.

- CarbonFree's strategy is to mitigate unplanned maintenance needs by applying sound engineering and construction practices, selecting high-quality and proven equipment, and implementing effective monitoring and preventive maintenance programs.

5. Environmental Effects Monitoring Plan

This section provides an overview of the anticipated environmental effects associated with the Project's operation and outlines the mitigation and monitoring measures designed to prevent, mitigate, or manage those effects.

5.1 Environmental Effects and Mitigation Measures

A summary of each potential effect, proposed mitigation, and an assessment of the potential residual effects are summarized below in Table 5-2, using criteria outlined in Table 5-1.

Table 5-1: Environmental Effects Analysis Criteria

Criteria	Description of Threshold Ratings
Magnitude	Negligible (0): No detectable change from baseline conditions. Low (1): Differs from the average value for baseline conditions but remains within the range of natural variation and below a guideline or threshold value. Medium (2): Differs substantially from the average value for baseline conditions and approaches the limits of natural variation, but equal to or slightly above a guideline or threshold value. High (3): Differs substantially from baseline conditions and is significantly beyond a guideline or threshold value, resulting in a detectable change beyond the range of natural variation.
Geographical Extent (Biophysical)	Project Location (1): Impact is limited to the Project Location. Study Area (within 50 m of Project Location) (2): Effect occurs throughout the Study Area. Beyond Study Area (3): Effect extends beyond the Study Area.
Duration	Short Term (1): Impact lasts less than 2 years (e.g., during the Construction Phase of the Project). Medium Term (2): Impact lasts from 2 to 50 years (i.e., encompassing construction and operation phases). Long Term (3): Impact lasts from 50 to 53 years (i.e., impact lasts into the decommissioning and post-closure phase).
Frequency	One Time (1): Impact is confined to one discrete event. Sporadic (2): Impact occurs rarely and at sporadic intervals. Regular (3): Impact occurs on a regular basis. Continuous (4): Impact occurs constantly.
Reversibility	Reversible (1): Impact can be reversed. Partially Reversible (2): Impact can be partially reversed. Permanent (3): Impact cannot be reversed, is of permanent duration.

Criteria	Description of Threshold Ratings
Ecological and Socio-Economic Context	• High (1): The receiving environment or population has a high natural resilience to imposed stresses, and can respond and adapt to the impact. • Neutral (2): The receiving environment or population has a neutral resilience to imposed stresses and may be able to respond and adapt to the impact. • Low (3): The receiving environment or population has a low resilience to imposed stresses, and will not easily adapt to the impact.
Certainty of Knowledge	• High (1): There is a good understanding of the cause-effect relationship and all necessary data are available for the Project. The effectiveness of the mitigation measures is well known. There is a low degree of uncertainty, and variation from the predicted effect is expected to be low. • Moderate (2): The cause-effect relationships are not fully understood, there are a number of unknown external variables, or data for the Project are incomplete. The effectiveness of mitigation measures is moderately well understood. There is a moderate degree of uncertainty; while results may vary, predictions are relatively confident. • Low (3): The cause-effect relationships are poorly understood, there are a number of unknown external variables, and data for the Project are incomplete. The effectiveness of the mitigation measures may not yet be proven. High degree of uncertainty and final results may vary considerably.

5.2 Monitoring Plan

Table 5-3 presents the environmental effects monitoring plan for the Project operation, which includes the following information:

- The potential negative environmental effects, carried forward from Table 5-2, that have an ongoing risk of occurrence during Project operation.
- The performance objectives and mitigation strategies to address those effects.
- Monitoring protocols to confirm that performance objectives are being met.
- Contingency measures in the event that objectives are not met, i.e., if monitoring reveals that negative effects are continuing to occur.

For additional information, monitoring will occur as outlined in the relevant reports (e.g., Natural Heritage Assessment, Water Body Assessment Report, Construction Plan Report).

Table 5-2: Summary of Potential Negative Effects and Proposed Mitigation – Operation Phase

Environmental Component	Sources of Negative Effect	Potential Negative Effect	Mitigation and Contingency Measures	Residual Environmental Effects Analysis						
				Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-Economic Context	Certainty of Knowledge
Natural Environment Components										
Soils	Ongoing road use by project vehicles.	- Erosion. - Fuel spills.	- Erosion and sediment controls. - Spill prevention and response planning.	2	2	2	2	1	2	1
Vegetation	Ongoing road use by project vehicles.	- Fugitive dust. - Spills (e.g., fuel). - Sedimentation. - Introduction of invasive species.	- Erosion and sediment controls. - Spill prevention and response planning. - Continued road maintenance.	2	1	3	1	1	2	1
Wetlands	Ongoing road use by project vehicles.	- Soil compaction. - Changes in moisture regime. - Fugitive dust. - Spills (e.g., fuel). - Sedimentation. - Introduction of invasive species.	- Setback Project components and fencing 50 m from features. - Spill prevention measures will be implemented and a response plan prepared.	2	2	2	3	2	2	2
Groundwater	- Ongoing road use by project vehicles. - Presence of new impervious Project Components (e.g., access roads, foundations, solar panels and other infrastructure).	Spills.	Spill prevention measures will be implemented and a response plan prepared.	1	1	2	2	3	2	2
Surface Water	- Ongoing road use by project vehicles. - Presence of new impervious Project Components (e.g., access roads, foundations, solar panels and other infrastructure). - Washing of solar panels during maintenance activities. - Wind and/or water erosion of soils within the Project Location.	Reduction in water quality or quantity (e.g., fuel spills, increased runoff, sedimentation).	- No project components will be installed within 50 m of a water body/watercourse. - Erosion and sediment controls will be installed. - Spill prevention measures will be implemented and a response plan prepared.	1	1	2	2	2	2	2
Aquatic Habitat	- Ongoing road use by project vehicles. - Presence of new impervious Project Components (e.g., access roads, foundations, solar panels and other infrastructure). - Washing of solar panels during maintenance activities. - Wind and/or water erosion of soils within the Project Location.	Limited (e.g., fuel spills). Project components are outside of buffers surrounding watercourses.	- Setback Project components and fencing 50 m from features. - Spill prevention measures will be implemented and a response plan prepared.	1	2	2	2	2	2	2

Environmental Component	Sources of Negative Effect	Potential Negative Effect	Mitigation and Contingency Measures	Residual Environmental Effects Analysis						
				Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-Economic Context	Certainty of Knowledge
Wildlife	- Ongoing road use by project vehicles. - Operation of inverters, transformers and other noise-generating equipment.	- Wildlife disturbance. - Incidental take/collisions with wildlife and vehicles.	- Monitoring and maintenance of noise generating equipment. - Speed and wildlife awareness signs on access roads.	1	1	2	1	3	1	2
Areas of Natural and Scientific Interest (ANSI)	N/A.	No ANSIs were identified within 300 m of the Project Location.	None required.	0	0	0	0	0	0	0
Socio-Economic Environment Components										
Air Quality, Odour, and Dust	Emissions from Project operations and maintenance vehicles.	Project operation will not discharge any pollutants into the air and emissions from maintenance vehicles or equipment will be negligible.	Mitigation measures will include standard best management practices.	1	2	2	2	1	3	1
Noise	- Presence of new Project Components (e.g., solar panels, transformers, inverters). - Emissions from Project operations and maintenance vehicles.	Disturbances to nearby sensitive receptors (i.e., houses and institutions) due to noise emissions.	A notice will be sent to neighbouring residents advising of how they can report complaints related to noise. Inquiries can also be made online at the project website.	1	2	2	4	1	2	1
Public and Facility Safety	Facility equipment malfunction, fire or accidents resulting in injury to public or maintenance personnel.	Personal injury to the public if trespassing on-site or to facility maintenance personnel due to accidents, fire or equipment malfunction.	- Public access to the site will be prevented by fences, gates, and security procedures. Proper health and safety (H&S) procedures for on-site maintenance personnel will be implemented as per provincial and federal regulations. - Mitigation will reduce risk to public and facility safety, but some risk to maintenance personnel will remain throughout Project operation.	1	1	2	2	1	3	1
Traffic and Municipal Roadways	Facility operation and maintenance personnel travelling to and from the Project.	None. The number and frequency of facility personnel travelling to the Project is negligible.	None required.	1	3	2	2	1	3	1
Visual Landscape	Presence of new Project Components (e.g., solar panels, transformers, inverters).	- Changes to local landscape/viewscape. - Potential visual disturbance to adjacent observers for short periods of time under site-specific conditions and viewing angles between March and September due to reflectivity of the PV modules.	A "green screen" of trees and shrubs will be installed in selected areas around the perimeter of the Project Location.	1	1	2	4	1	2	1
Property Values	Presence of new Project Components (e.g., solar panels, transformers, inverters).	Installation of the facility has the potential, though unproven, to result in a change in the value of nearby properties based on aesthetic preference of potential landowners. Though subjective, the potential change in property values for the purpose of this assessment is considered as a potential negative effect.	Mitigation measures to minimize visibility from neighbouring properties as well as noise emissions.	1	3	2	2	1	2	3

Environmental Component	Sources of Negative Effect	Potential Negative Effect	Mitigation and Contingency Measures	Residual Environmental Effects Analysis						
				Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-Economic Context	Certainty of Knowledge
Protected Areas	N/A.	None. There are no protected areas within 300 m of the Project Location.	None required.	0	0	0	0	0	0	0
Aggregate Resources	Presence of new Project Components (e.g., solar panels, transformers, inverters).	The Project will not influence the availability of aggregate resources in the area. Any aggregate resources available within the Project Location will remain in place throughout the construction, operation, and decommissioning of the Project.	None required.	0	0	0	0	0	0	0
Land Use	Presence of new Project Components (e.g., solar panels, transformers, inverters).	Loss of agriculture.	- An agrivoltaics program will be implemented throughout the Project lifecycle, promoting a dual use of solar energy and agriculture. - Site restoration will restore the ability to use the area under, beneath and immediately surrounding the solar PV panels for agriculture (e.g., sheep grazing).	1	1	2	4	1	2	1
Archaeological Resources	None.	None. No archaeological resources are known to be present.	None required.	0	0	0	0	0	0	0
Protected Properties, Built Heritage and Cultural Heritage Landscapes	N/A.	None. No protected properties, built heritage or cultural heritage landscapes have been identified within 300 m of the Project Location.	None required.	0	0	0	0	0	0	0
Airports, Aerodromes, and Air Traffic	Presence of new Project Components (e.g., solar panels, transformers, inverters).	The closest airport/aerodrome is over 5 km away from the Project Location. No disruption to local air traffic is anticipated.	None.	1	3	2	0	1	3	2

Table 5-3: Environmental Effects Monitoring Plan – Operation Phase

Negative Effect	Mitigation Strategy	Performance Objective	Monitoring Plan					Contingency Measures
			Methodology	Monitoring Locations	Frequency	Rationale	Reporting Requirements	
Erosion and Sedimentation Resulting in Increased Turbidity in Site Runoff	Sediment and erosion controls will be installed and maintained between the Project Location and wetlands or watercourses where work is required within 50 m of wetlands or 120 m of water features. Maintained 50 m setback between the Project and sensitive features.	No long-term erosion from site over and above existing conditions.	Visual monitoring of vegetated areas and drainage features that convey runoff to identify areas of erosion (e.g., rills, gullies). Visual monitoring of ESC measures to ensure they remain effective throughout operations.	Throughout Project Location.	During regular site inspection throughout operations.	Visual monitoring of erosion would identify potential areas of concern.	Maintenance and improvement requirements actioned as needed and reported internally throughout monthly operations monitoring reports. Ongoing status of permanent features reported internally within annual operations report.	Erosion remediated as necessary to ensure no long-term erosion issues.
Adverse Effects to Surface Water, Groundwater, Wetlands, and Soil Quality Due to Accidental Spills	Standard mitigation to prevent spills and minimize magnitude of spills if they occur. For example, refueling at least 50 m from wetlands and water features.	No long-term environmental effects due to spills.	Visual monitoring where hazardous liquids may be stored, at transformer locations, where refueling may occur, and in parking areas. Monitoring of spill prevention measures, with spill reporting procedure in place.	Throughout Project Location.	During regular site inspections.	Visual monitoring would identify potential areas of concern and ensure that spill prevention and control measures are functioning as designed and protocols are being implemented as specified in plans to meet performance objectives.	Reported in annual operations reports. Reportable spills in water or spills on land >100 litres must be documented and reported immediately to the Ontario Spills Action Centre.	Spill contingency measures implemented as necessary in the event of a spill. Following spill event, response will be reviewed to determine if additional or altered response protocols are necessary to meet performance objectives.
Increases in Surface Water Runoff from Project Location and Changes in Drainage/ Hydrological Conditions	Maintain existing drainage patterns as much as possible.	No impacts on water quantity/drainage patterns. Minimize changes to surface water runoff conditions to receiving waterbodies.	Visual monitoring of vegetated areas and drainage features that convey runoff to identify areas of erosion (e.g., rills, gullies). As well, visual assessment of structural stability of mitigation measures and identification of unintended impacts.	Throughout Project Location.	During regular site inspections.	Visual monitoring will confirm that stormwater management measures remain as designed and allow identification of deficiencies.	Reported internally within annual operations report.	Stormwater management measures will be remediated as necessary to ensure that they are functioning as designed. With erosion remediated as necessary to ensure no long-term erosion issues.
Incidental Take of Wildlife	Speeds to be limited on Project Location and maintenance workforce to be made aware of potential for wildlife on the Project Location.	No occurrences of incidental take.	Visual monitoring of access roads and other site areas will be conducted by workers on foot, and occasions of incidental take reported as they are identified.	Throughout Project Location.	Infrequently during operations/ maintenance.	Incidental take will be reported by workers to personnel responsible for environmental protection if incidents occur.	Any incidental takes on wildlife will be documented internally and reported within annual operations reports. Unless the incidental takes of species is a species of conservation concern in which case reporting will be immediate to the MECP/Environment Canada.	If incidental take of species of conservation concern are recorded, work will be ceased until such time as a trained biologist can state that no other individuals of the species is present in the work area. Injured wildlife, specifically reptiles, will be taken to a wildlife rehabilitation center.

Negative Effect	Mitigation Strategy	Performance Objective	Monitoring Plan					Contingency Measures
			Methodology	Monitoring Locations	Frequency	Rationale	Reporting Requirements	
Dust Generation and Off-Site Transport	Minimizing vehicle speeds on unpaved roads. Stabilizing stockpiles. Spraying unpaved roads with water during dry periods.	Minimize fugitive dust from the operations and maintenance on-site.	Visual monitoring of visible dust plumes during operations. Additionally, in winter visual monitoring of snowbanks for dust fall. Complaint system in place in case neighbours have an issue.	Throughout operations of the site.	Periodically during operations.	Visual monitoring would identify areas of concern, and complaint system would further indicate the extent and magnitude of the problem.	Reported in annual operations monitoring report.	More frequent watering of roads may be implemented, or use of a chemical dust suppressant may be considered if watering is not sufficient.
Noise Levels Disturbing Nearby Noise Receptors	Maintenance activities typically limited to daylight hours. Ensure mufflers are in good working order on vehicles/machinery. Limit vehicle idling. Implement noise barriers around receptors.	To minimize excessive noise emissions at nearby noise receptors.	Ongoing dialogue with adjacent noise receptors and follow-up response to noise complaints.	Throughout the site with emphasis at the closest sensitive noise receptors.	Continually throughout operations.	Complaint system would indicate the extent and magnitude of the problem.	Reported in annual operations monitoring report.	If Project components are not meeting performance objectives with respect to noise emissions, the Proponent will work with affected noise receptors to reduce disturbance to the extent possible.
Personal Injury to Public if Trespassing On-Site	Fencing, gates, lighting, signage and/or cameras to be used to limit unauthorized access.	Zero project-related injuries.	Site security monitoring.	Throughout the Project Location and facility perimeter.	Sporadic throughout operations.	Cameras will show any unauthorized access.	Incidents of trespassing or vandalism will be reported to local authorities.	Additional security measures will be implemented as required.
Increase in Traffic and Impacts to Local Roads	Use highway as main access road during maintenance to the extent possible.	Minimal disturbance to road condition and to public use of the roads.	Visual monitoring of road conditions. Public complaint system in place.	Along any local access roads that may be used for maintenance and operations.	Periodically throughout operations.	Visual monitoring can detect issues like potholes or washouts. Complaint system will also indicate if there is a problem.	Reported in annual operations monitoring report.	Maintenance and operations traffic could be re-scheduled or rerouted if necessary.

6. Emergency Response and Communications Plan

The following describes the implementation of the Project Emergency Response and Communications Plan as it pertains to the construction and operation phases of the Project. A similar plan is provided for the decommissioning phase of the Project in the Decommissioning Plan Report.

6.1 Emergency Response

The purpose of the Project Emergency Response Plan is to establish and maintain emergency procedures required for effectively responding to accidents and other emergency situations, and for minimizing associated losses. Potential emergency scenarios which could occur during the construction and operation phases include fire, personal injury, and spills incidents. The following provides the emergency response and communications procedures to be used in response to these scenarios. All Project personnel will receive training in these procedures.

6.1.1 Fire

Fire extinguishers will be located in strategic locations such as Project vehicles. During construction and operation, a sign will be erected near the front gate of the facility. The sign will include instructions to call 911 and to call a Project phone number should a passerby notice an emergency.

If a fire occurs, Project personnel will attempt to extinguish it, only if it is safe to do so. If there is any risk of personal injury, extinguishing the fire will not be attempted. If a fire cannot be extinguished using the hand-held extinguishers, the Project area will be evacuated and Project personnel will immediately call 911 to summon the local fire department (and ambulance if required). All staff on-site during the life of the Project will be trained in the procedure to deal with a fire and the use of an extinguisher.

All incidents will be documented and kept on file. Documentation will include date of incident, date of reporting, name of reporter, description of the incident, cause of the incident, actions taken, communications to outside groups, and internal personnel and follow-up required.

6.1.2 Personal Injury

During the construction phase, the work will be completed by contractors, who will establish their own Health and Safety (H&S) program in accordance with the Ontario Occupational Health and Safety Act. During operations, the CarbonFree will similarly establish their own H&S program to be followed by facility personnel.

Should an injury occur on-site that does not require an ambulance, the injured person will be treated on-site and, if necessary, transported to the hospital depending on the extent of the injury. If the injury is more severe, Project personnel will call 911 and assist the injured person until emergency personnel arrive.

In all cases of injury, the Project construction manager and the Project facility manager will be notified immediately. All incidents will be documented and kept on file. Documentation will include date of incident, date of reporting, name of reporter, name of injured, description of the incident, cause of the incident, actions taken, communications to outside groups and internal personnel and follow-up required, as required by H&S regulations.

6.1.3 **Spills**

Spills and the types of spills that require reporting are defined in the Ontario Environmental Protection Act and O. Reg. 675/98 Classification and Exemption of Spills and Reporting of Discharges.

Spills are the unintended release/discharge of material to air, land or water. The most likely spill scenarios could include a fuel or oil leak from a vehicle or a spill from improper handling, or a hazardous material leak from a container or a spill from improper handling. Spill prevention tactics include the following:

- All potentially hazardous materials, fuels and lubricants must be stored in the laydown area, in a protected/bermed area and at least 50 m from watercourses.
- All refueling and equipment maintenance activities will be conducted at least 50 m from wetlands or water features.
- Vehicles and machinery are to be monitored to ensure they are well maintained and free of leaks.
- Portable toilets will be located no closer than 50 m from a watercourse/drain and will be pumped by an MECP-approved hauler to an approved facility.

In the event of an accidental spill, the response plan includes:

- Evaluating the scene for risks to human health and safety.
- If there is immediate danger to human health, contact 911 for assistance and notify anyone who may be directly impacted or is in harm's way.
- Notify the Project Manager of the incident.
- Contain and clean up the spill using on-site spill kit, if it is safe to do so.
- If required, contact outside spill response contractor for assistance.
- Report the spill to the provincial Spills Action Centre (SAC), as required.

A spill kit will be available on-site during the construction, operation and decommissioning phases and will contain equipment necessary for spills response. This will include absorbent pads, absorbent boom, polyethylene bags, neoprene gloves, protective goggles, plastic bins or metal drums, and multipurpose granular sorbents.

Spills that could potentially occur during the life of the Project, and may need to be reported include:

- Non-approved releases/discharges (including those to land, air, and water).
- Discharge of fluids greater than 100 litres from a vehicle.
- Mineral oil releases greater than 100 litres from an electrical transformer.
- Discharges (including sediment) to waterbodies.

The MECP SAC phone number (1-800-268-6060) will be posted on-site.

Documentation for all spill incidents will be kept on file and sent to the MECP, as required. Documentation will include date of incident, date of reporting, name of reporter, description of the incident, cause of the incident, type and amount spilled, actions taken, disposal of contaminated material, communications to outside groups and internal personnel, and follow-up required. A designated Site Environmental Inspector will be appointed by the contractor to ensure compliance with these plans and will be responsible for ensuring all site workers know what to do in the event of a spill.

6.2 Non-Emergency Communications

During all phases of the Project, including operations, a sign will be posted at the facility gate with a Project phone number for public questions, inquiries, or complaints. All inquiries will be directed to the Proponent Project Representative, who will respond accordingly.

All questions, inquiries, and complaints will be logged electronically with the following information: date, name, phone number, email address, response, date of response, and any follow-up actions. Complaints will additionally be logged in a Complaint Response Document.

Efforts will be made to address identified concerns and implement any necessary corrective actions as soon as reasonably possible. The steps taken to resolve the issue, along with any planned measures to prevent similar complaints from arising in the future, will also be documented in the Complaint Response Document.

If at any time public notification is required (e.g., Project changes), the public will be notified through newspaper and direct or general mail-outs, if needed. Should agencies such as the local municipality or the MECP require notification, they will be sent the information directly by email, mail, or telephone conversation. All communications will be documented and kept on file by the Proponent.

As noted previously, additional information or inquiries can be directed to the project website, [CarbonFree Fort Frances](#).

7. References

CarbonFree Fort Frances. 2026. CarbonFree Fort Frances Project Website.

Government of Ontario. 2026. Map: Well Records. Ministry of the Environment, Conservation and Parks. Available at: <https://www.ontario.ca/page/map-well-records>.

Government of Ontario. 2024. Ontario Regulation 359/09: Renewable Energy Approvals under the Environmental Protection Act.

Hatch Ltd. 2026. CarbonFree Fort Frances Project; Acoustic Assessment Report. H375736-0000-846-066-0001.

Hatch Ltd. 2026. CarbonFree Fort Frances Project; Decommissioning Plan Report. H375736-0000-840-066-0007.

Hatch Ltd. 2026. CarbonFree Fort Frances Project; Natural Heritage Assessment. H375736-0000-840-066-0002.

Hatch Ltd. 2026. CarbonFree Fort Frances Project; Stormwater Management. H375736-0000-220-066-0001.

Hatch Ltd. 2026. CarbonFree Fort Frances Project; Construction Plan Report. H375736-0000-840-066-0003.

Hatch Ltd. 2026. CarbonFree Fort Frances Project; Water Body Assessment Report. H375736-0000-840-066-0004.

Hatch Ltd. 2026. CarbonFree Fort Frances Project; Project Description Report. H375736-0000-840-066-0001.

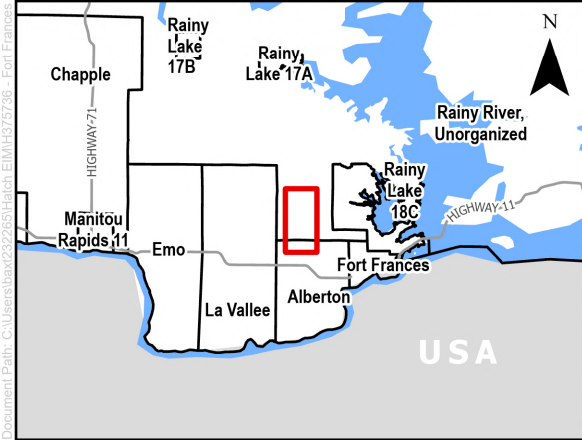
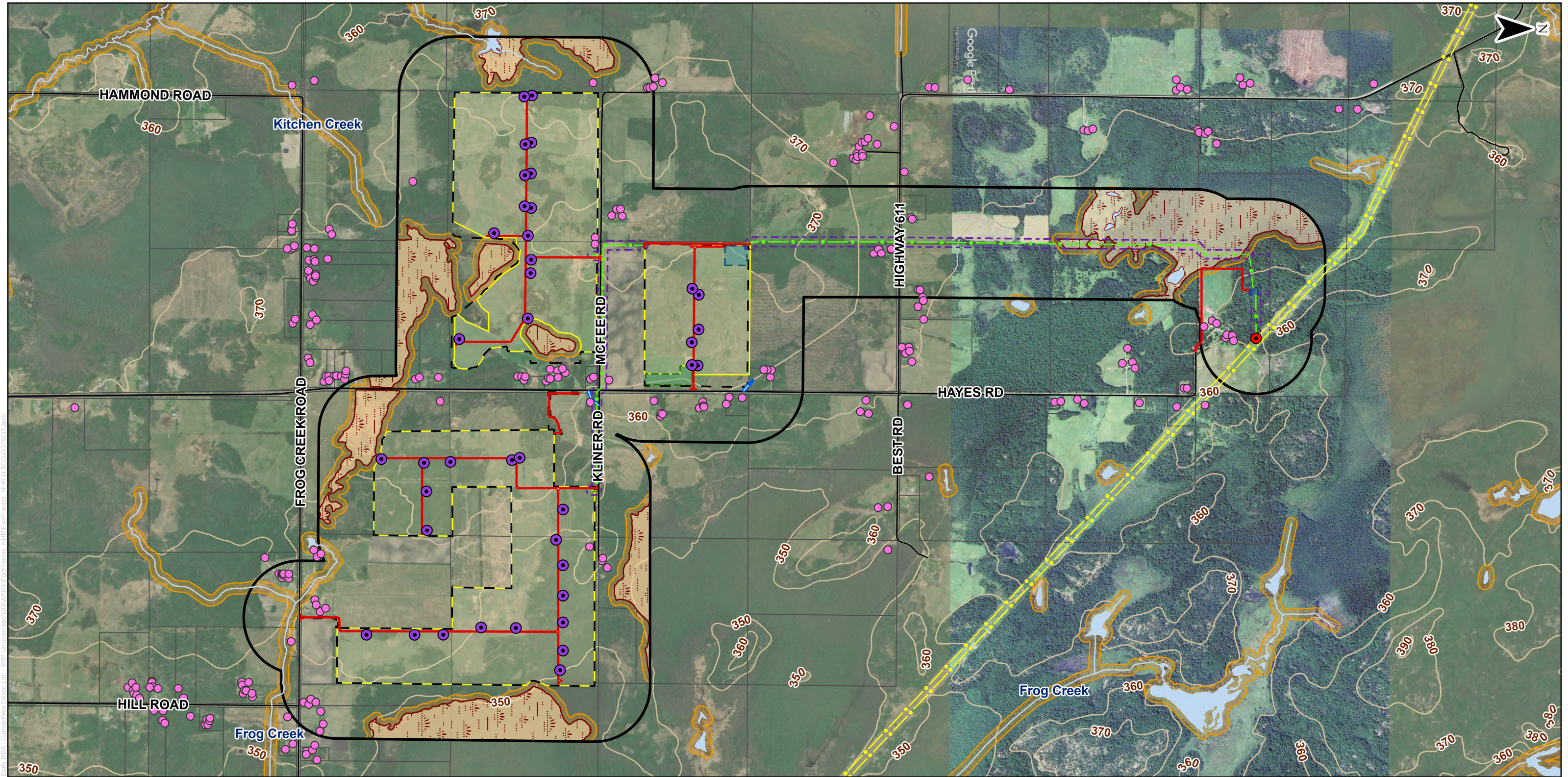
King's Printer for Ontario. 2024. Provincial Policy Statement 2024. Planning Act. Ministry of Municipal Affairs and Housing.

Woodland Heritage Northwest. 2025. Cultural Heritage Evaluation for Carbonfree Group Lots 7, 8 CON 1, Lot 9 CON 2 and Lot 9 CON 4, Township of Miscampbell, District of Rainy River, Ontario.

Woodland Heritage Northwest. 2025. Stage 1 AA for Lots 7, 8 CON 1, Lot 9 CON 2 and Lot 9 CON 4, Township of Miscampbell, District of Rainy River, Ontario.

Appendix A

Site Layout



LEGEND

- Noise Receptor
- Inverter
- Point of Connection
- Access Road
- Contour
- Road
- Proposed Transmission Line

- Transmission Line
- Unnamed Watercourse
- Watercourse
- Transmission Infrastructure
- Project Location
- Study Area (300m Buffer)

- Property Boundary
- Offices/Laydown Area
- Solar Array
- Substation/Switching Station
- Waterbody
- Wetland
- Riparian Buffer

NOTES:
1. Produced by Hatch, contains information licensed under the Open Government Licence – Ontario
2. Spatial referencing: NAD 1983 UTM Zone 15N
3. GoogleEarth 2025 Imagery added for clarity due to cloud cover.

02505001,000

1:20,000

m

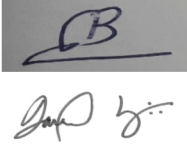
PROJECT: CarbonFree Fort Frances Project - Design and Operations Report				
FIGURE TITLE: Site Layout				
CLIENT: CarbonFree Fort Frances LTD				
DWG BY: V. BAXTER	CHK BY: C. SEHL	FIG NO.: A1	REV NO.: 1	HATCH
DATE: 03/03/26	PAGE: 1			

Appendix B

Stormwater Management Plan

CarbonFree Fort Frances Project Stormwater Management Report

H375736-0000-220-066-0001

						
2026-06-08	1	Approved for Use	F. Sargordi	M. Basiq, D. Stanger	J. Mohammad	-
2026-06-05	0	Approved for Use	F. Sargordi	M. Basiq, D. Stanger	J. Mohammad	-
DATE	REV.	STATUS	PREPARED BY	CHECKED BY	APPROVED BY	APPROVED BY
				Discipline Lead	Functional Manager	Client

H375736-0000-220-066-0001, Rev. 1,

IMPORTANT NOTICE TO READER

This report has been prepared by Hatch Ltd. (Hatch) for the sole and exclusive use of CarbonFree Fort Frances Ltd. (the "Client") for the purpose of assisting the Client in making decisions with respect to the development of a proposed solar photovoltaic project and shall not be (a) used for any other purpose, or (b) provided to, relied upon or used by any third party.

This report contains opinions, conclusions and recommendations made by Hatch, using its professional judgment and reasonable care. Any use of or reliance upon this report by the Client is subject to the following conditions:

1. This report to be read in the context of and subject to the terms of the agreement between Hatch and the Client including any methodologies, procedures, techniques, assumptions and other relevant terms or conditions that were specified or agreed therein;
2. This report to be read as a whole, with sections or parts hereof read or relied upon in context.
3. The conditions of the Project Location may change over time (or may have already changed) due to natural forces or human intervention, and Hatch takes no responsibility for the impact that such changes may have on the accuracy or validity of the observations, conclusions and recommendations set out in this report; and
4. The report is based on information made available to Hatch by the Client or by certain third parties; and unless stated otherwise in the Agreement, Hatch has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith.

Table of Contents

1. Introduction.....	1
1.1 Study Approach	1
2. Existing Conditions	3
2.1 Wetlands and Vegetation.....	3
2.2 Waterbodies.....	3
2.3 Geotechnical Information.....	5
2.4 Hydrogeological Information	5
2.5 Topography and Surface Drainage	7
3. Proposed Conditions	9
4. Stormwater Management Design.....	11
4.1 Stormwater Management During Construction	11
4.2 Stormwater Management Post-Construction.....	11
4.2.1 Assessment of Impacts.....	11
4.2.2 Design Storms	12
4.2.3 Hydrologic Analysis	13
4.2.4 Stabilization Vegetation	15
4.2.5 Water Quality Control	15
5. Stormwater Management Maintenance and Monitoring.....	16
6. Erosion and Sediment Control Plan	17
6.1 Site Erosion Potential	17
6.2 Erosion and Sediment Control Measures.....	17
6.3 Erosion and Settlement Control Monitoring Program	18
6.4 Construction Phase Measures	19
7. Conclusion and Recommendations	20

List of Tables

Table 3-1: Catchment Characteristics in Proposed Conditions.....	9
Table 4-1: Pre-Development Land Use and Runoff Coefficient	12
Table 4-2: Post-Development Land Use and Runoff Coefficient	12
Table 4-3: Peak Flows and Changes	14

List of Figures

Figure 1-1: Fort Frances Project Location	2
Figure 2-1: Natural Features, Waterbodies and Land Uses.....	4
Figure 2-2: Test Locations Across the Fort Frances Area.....	6
Figure 2-3: Existing Drainage Area Plan	8
Figure 3-1: Catchment Area for the Proposed Condition	10

List of Appendices

Appendix A	IDF Table for Fort Frances
Appendix B	Overall Site Plan
Appendix C	Grading and Drainage Plan
Appendix D	Erosion and Sediment Control Plan

1. Introduction

CarbonFree Fort Frances Ltd. (CarbonFree) is proposing to develop a 167.2 megawatt (MW) Class 3 solar photovoltaic (PV) project (the “Project”) adjacent to Highway 611, approximately 7.5 km northwest of Fort Frances (see Figure 1-1).

Ontario Regulation (O. Reg.) 359/09 identifies the Renewable Energy Approval (REA) requirements for renewable energy generation facilities in Ontario. This regulation requires the development of a design and operations report for the proposed project, including the preparation of a Stormwater Management Report and the incorporation of erosion and sediment control (ESC) features and stormwater management facilities.

This report evaluates baseline drainage conditions and assesses potential project impacts based on the proposed design of the Project. Where needed, the report prescribes mitigation measures with the goal of preventing adverse effects on sensitive environmental features, or neighboring properties in line with the requirements of the REA.

1.1 Study Approach

The methodology adopted for this assessment comprises the following key elements:

- Conduct a quantitative analysis to determine the existing hydrologic conditions for the Project Location.
- Examine the proposed development activities, with particular attention to evaluating potential implications arising from modifications to project location hydrology.
- Finalize the design of stormwater management infrastructure intended to regulate surface runoff in accordance with the standards and guidelines prescribed by the Ministry of the Environment, Conservation and Parks (MECP).
- Formulate an ESC program that defines the strategies and best management practices to mitigate construction-related impacts to downstream watercourses and receiving aquatic systems.

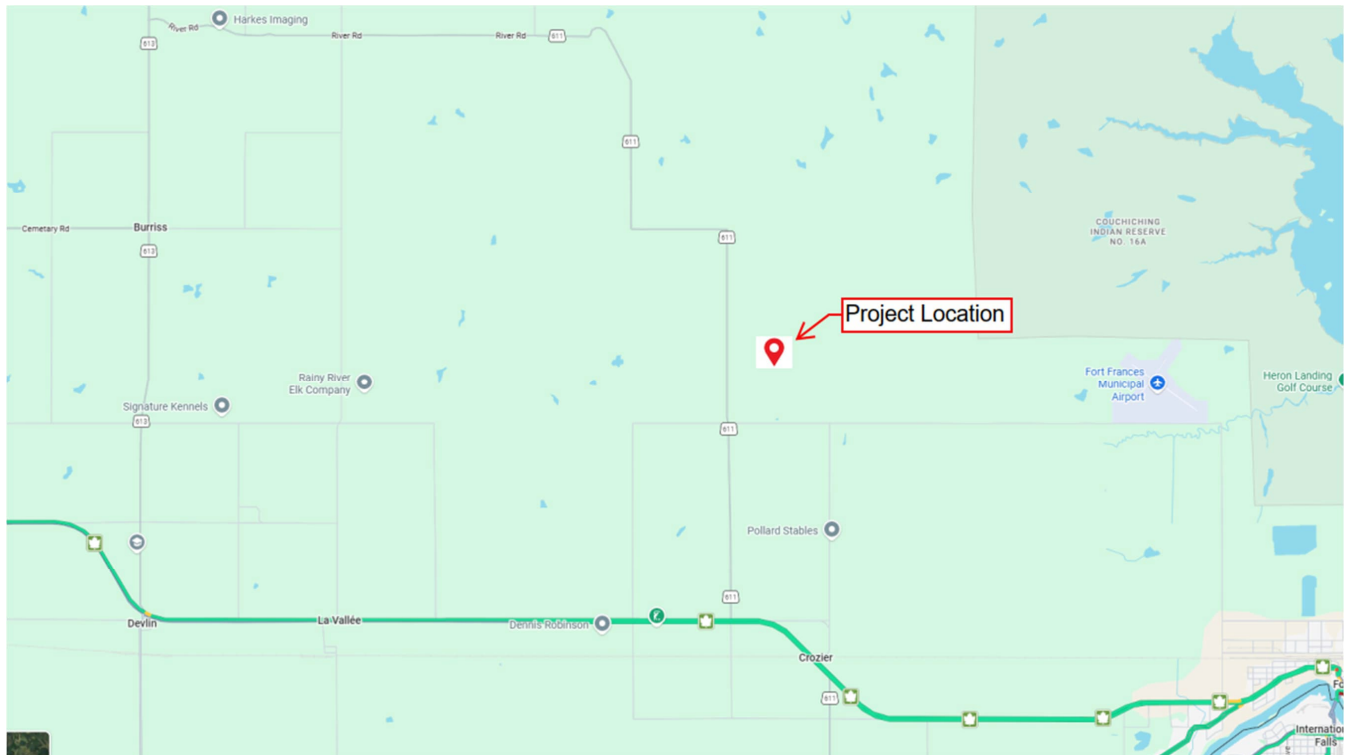


Figure 1-1: Fort Frances Project Location

2. Existing Conditions

2.1 Wetlands and Vegetation

The Fort Frances Project Location consists mainly of agricultural lands, open grasslands, and patches of forest, with generally flat terrain. Site investigations in 2025 identified the presence of six wetlands within the Project Location or within 50 m of the Project Location. These wetlands provide important ecological functions such as water quality protection, flood attenuation, and erosion control. The Project provides minimum 30 m setbacks from all wetlands, with the exception of the wetland area on the north, where a portion of the proposed transmission line will overlap with one wetland (Figure 2-1). The Project's Natural Heritage Assessment Report (H375736-0000-840-066-0002) contains further details regarding wetlands, potential impacts and associated mitigation measures.

2.2 Waterbodies

The Project's Water Body Assessment Report prepared by Hatch (H375736-0000-840-066-0004) confirms that no lakes, seepage areas, or Lake Trout Lakes occur within or adjacent to the Project Location. Within 120 m of the Project Location, the drainage features consist of the following permanent watercourses: Frog Creek, a semi-defined channel, and Kitchen Creek. Site investigations verified that all proposed project components are situated a minimum of 30 m from watercourses, and no hydraulically connected channels intersect the proposed Project Location, conveyance, or drainage infrastructure. Accordingly, the stormwater management strategy is governed by preservation of existing overland flow pathways rather than by channel conveyance requirements and preventing sediment transport through the application of ESC measures. As no in-channel works or watercourse-specific hydraulic constraints apply, stormwater design emphasizes maintaining pre-development drainage patterns and ensuring that post-development runoff from the project location does not adversely affect downstream intermittent systems.

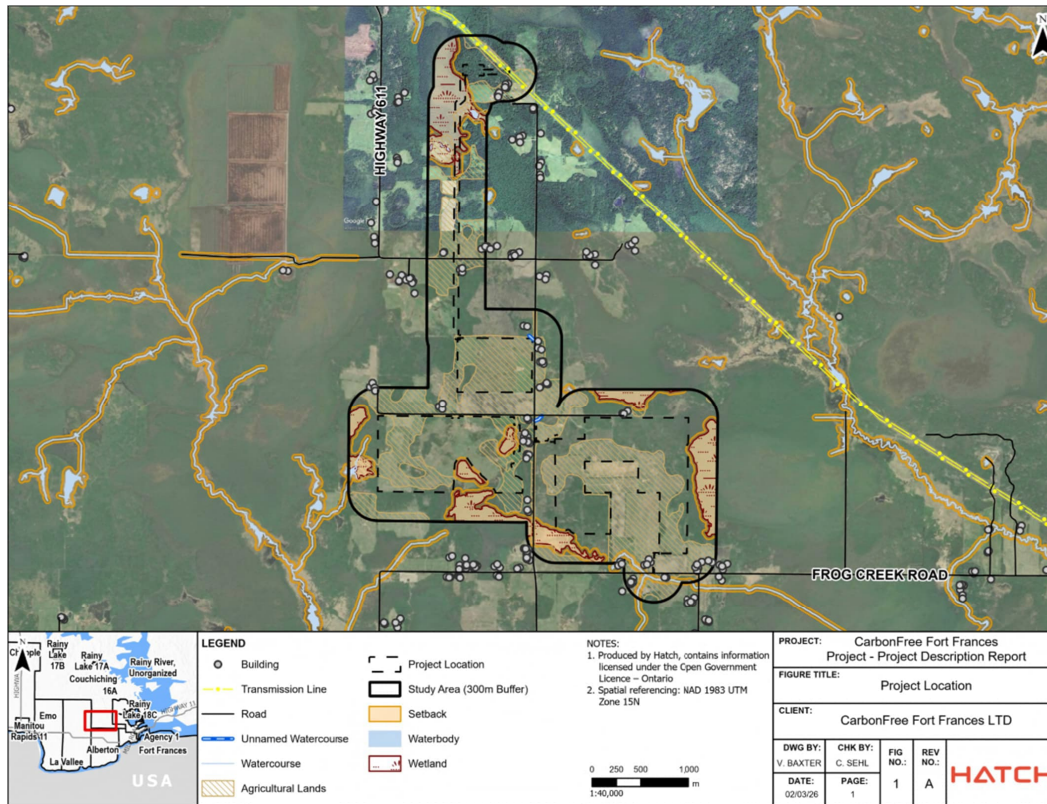


Figure 2-1: Natural Features, Waterbodies and Land Uses

2.3 Geotechnical Information

TBT Engineering Limited (TBTE) carried out a Preliminary Geotechnical Investigation for the CarbonFree Fort Frances Solar Project (2026). The summary presented below reflects TBTE's original findings and interpretations.

The Project Location is overlain by approximately 0.1 to 0.3 m of organic topsoil and previously cultivated surficial material. It was detailed in the Preliminary Geotechnical Investigation Report that native cohesive soil was found in the majority of the test pits and borehole locations. The cohesive soil observed in these test pits and borehole location were described as ranging from silty clay to clay, and gravel. It has also been detailed in the report that cohesionless sand with some gravel was observed below the surficial coverings in test pit TP25-18, and the cohesionless silty sand unit observed in BH25-01 is considered to be glacial till and has a significant cobble and/or boulder content.

Bedrock was not cored, but refusal depths indicate it generally occurs between approximately 2.2 m and 4.8 m, with the shallowest at TP25-23 (2.2 m) and others typically between 3.7 to 4.8 m; the deepest refusal is BH25-01 at 9.8 m, which may represent bedrock or boulders.

The cohesive soils are highly susceptible to softening and strength loss if remolded, trafficked, or exposed to excess moisture.

The frost penetration depth is 2.6 m. Foundations and slabs require either equivalent soil cover or a suitable insulation based frost protection system.

Figure 2-2 depicts the locations of boreholes, test pits, monitoring wells, and dilatometer tests completed throughout the Fort Frances Project location. It overlays these geotechnical investigation points onto the proposed solar array layout and Project Location, along with the ground surface elevations measured at each test location.

2.4 Hydrogeological Information

The Preliminary Geotechnical Investigation for the CarbonFree Fort Frances Solar Project (2026) prepared by TBTE includes the Project Location hydrogeological information and is detailed in this section.

The subsurface profile consists predominantly of low-permeability cohesive overburden soils (stiff to very stiff silty clay to clay, locally sandy or gravelly) with intermittent thin sand seams and occasional zones of sandy or silty sand till encountered near refusal in isolated locations. Test pit refusal on assumed bedrock occurred at depths generally between 2.2 m and 5 m, indicating that shallow bedrock or large boulders underlie portions of the Project Location.

The groundwater conditions varied across the project location. Among the test pits, TP25-29 encountered the shallowest groundwater level at approximately 1.5 mbgs. Groundwater was also observed in TP25-15 and TP25-22 at depths of 4.8 mbgs and 3.7 mbgs, respectively. These groundwater levels are consistent with the low-permeability clay soils present in the area and suggest potential for seasonal fluctuations, particularly during spring thaw.

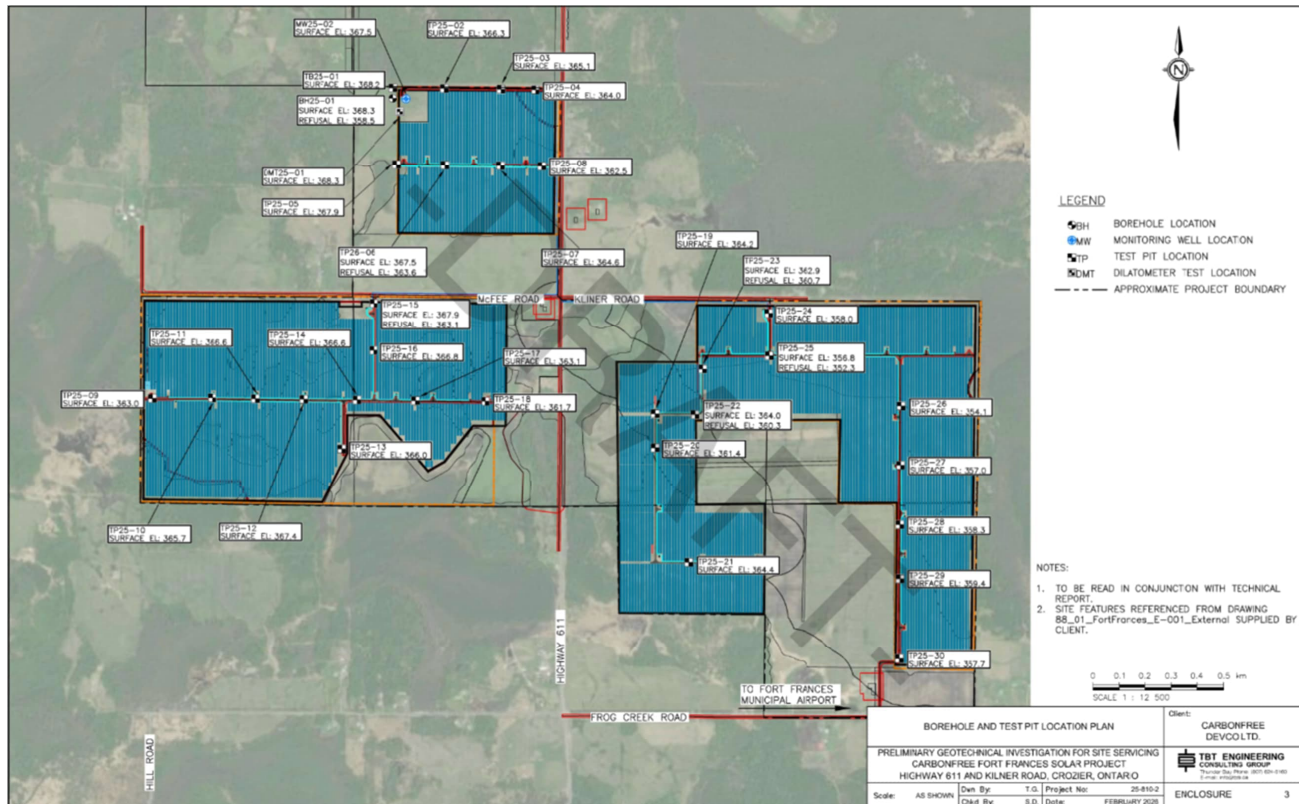


Figure 2-2: Test Locations Across the Fort Frances Area

Construction excavations may encounter seepage, particularly where they approach the soil-bedrock interface or extend below seasonal groundwater levels, and sump pumping will likely be required to maintain dry working conditions in deeper excavations.

2.5 Topography and Surface Drainage

Topographical information (1 m contours) available for the Project Location indicates ground elevations ranging from 349 m to 369 m. The surface runoff generally drains away from the 368 to 369 m high ground toward the lower 349 to 355 m areas shown in Figure 2-3. The existing topography shows that Array 3 has the steepest slopes, followed by moderate slopes in Array 2 and gentle slopes in Array 1. Overall, runoff moves from the elevated northwest/central zones toward the lower catchment areas.

Thirteen internal catchments (CA1 through CA13) and two external catchments (EXT 1 and EXT 2) are delineated with mapped areas ranging from 2.36 to 39.95 ha, and the total catchment area is approximately 314.76 ha. The largest catchments are CA9 (approximately 39.95 ha), while CA8 is the smallest (approximately 2.36 ha).

The Project Location drainage catchments are shown in Figure 2-3 and are described as follows.

This delineation serves as a foundational reference for applications including runoff estimation, stormwater infrastructure design, and environmental planning, ensuring effective catchment management and sustainable land-use strategies.

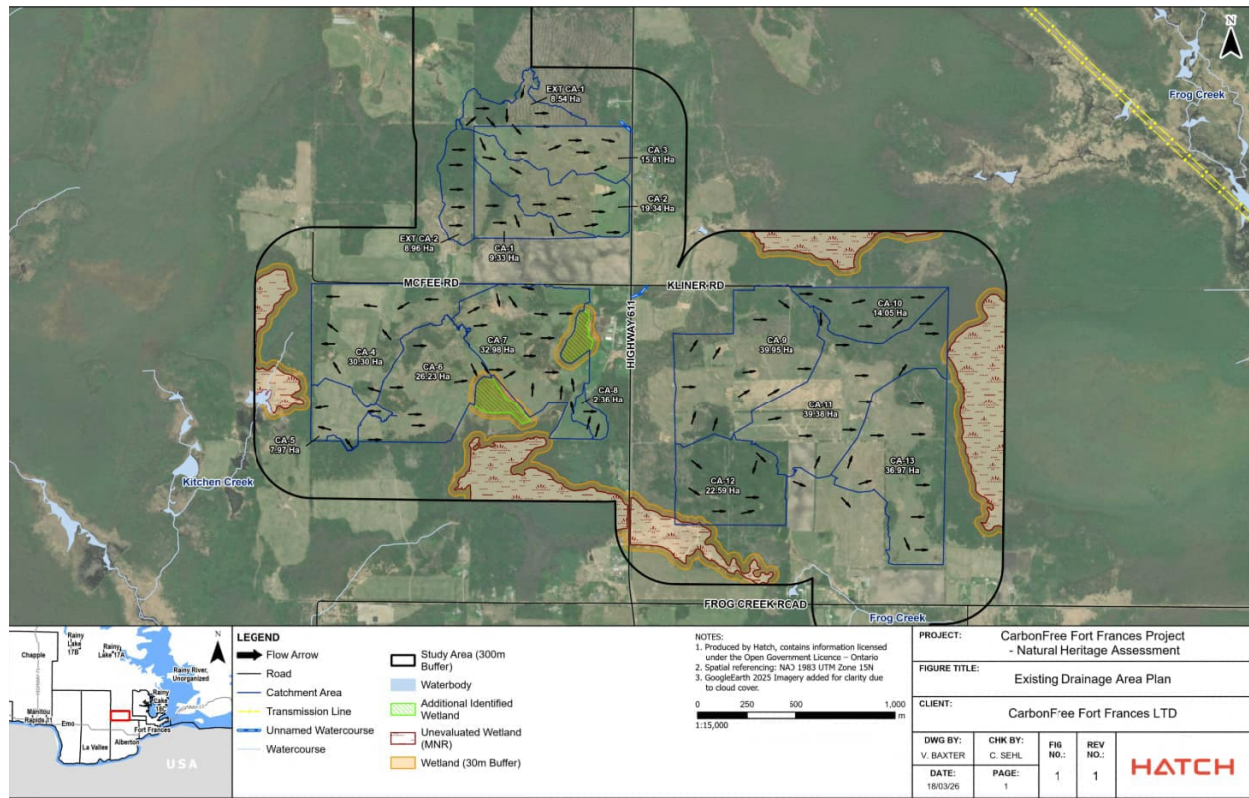


Figure 2-3: Existing Drainage Area Plan

3. Proposed Conditions

The proposed layout introduces engineered features within the existing catchment framework, shifting from predominantly natural conditions to a mixed-use configuration. The primary modifications consist of new gravel access roads, inverter pads, a gravel high-voltage substation area (see H375736-0000-230-260-0001; substation and inverters footprint would be finalized during the detailed engineering), and perimeter/internal fencing. These features increase the area of imperviousness throughout the Project Location but will not significantly alter the major surface water drainage patterns. The proposed design includes three photovoltaic arrays (PV Arrays 1 to 3, Figure 3-1) with associated trackers and defined access gates. Overall, the proposed design adds localized hard surfaces but keeps the natural drainage system functioning as before, with no meaningful change to the main runoff pathways established by the existing topography. The proposed Project introduces 7.61 ha of semi-pervious gravel surfaces (roads and substation) and 1.60 ha of impervious concrete areas associated with the inverter pads, while the remaining land stays as native cover. These altered surfaces are small relative and are dispersed across Arrays 1 to 3, resulting in only localized surface alteration.

Figure 3-1 demonstrates the catchment areas in the proposed condition.

Table 3-1 provides a breakdown of land use within the catchment areas of the project location under the proposed development conditions.

Table 3-1: Catchment Characteristics in Proposed Conditions

Catchment	Array	Area (ha)	Impervious (ha)	Semi-Pervious (ha)	Impervious Area (%)
1	1	9.33	0.00	0.35	0.00
2	1	19.34	0.24	3.06	1.24
3	1	15.81	0.00	0.45	0.00
EXT 1	1	8.54	0.00	0.00	0.00
EXT 2	1	8.96	0.00	0.00	0.00
4	2	30.30	0.16	0.28	0.53
5	2	7.97	0.00	0.00	0.00
6	2	26.23	0.24	0.35	0.91
7	2	32.98	0.20	0.68	0.61
8	2	2.36	0.00	0.06	0.00
9	3	39.95	0.24	0.81	0.60
10	3	14.05	0.12	0.24	0.85
11	3	39.38	0.12	0.28	0.30
12	3	22.59	0.12	0.48	0.53
13	3	36.97	0.16	0.57	0.43
Total		314.76	1.60	7.61	

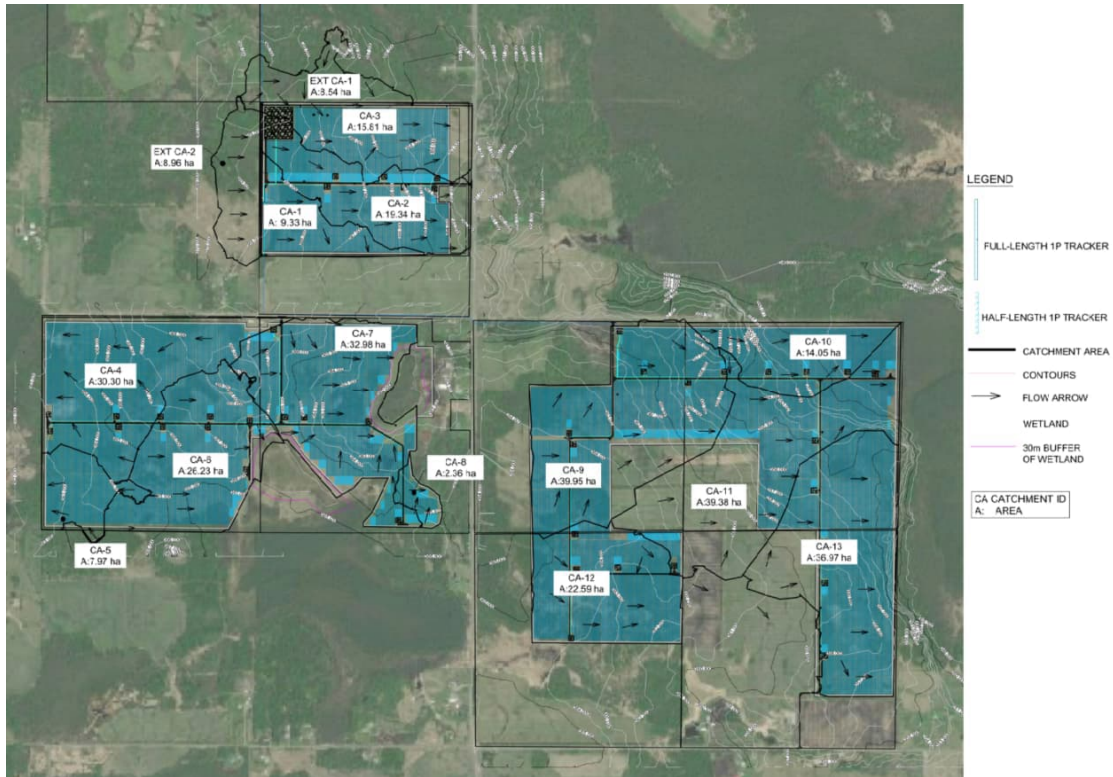


Figure 3-1: Catchment Area for the Proposed Condition

4. Stormwater Management Design

Following the Ministry of the Environment, Conservation and Parks MECP guidelines, the stormwater management plan for the Fort Frances Project was designed to manage site runoff during and after construction.

4.1 Stormwater Management During Construction

Vegetation removal and soil compaction caused by construction traffic during solar facility development can increase peak runoff rates and volumes compared to post-construction conditions following site stabilization. Full establishment of stabilization vegetation often requires multiple growing seasons before the site's hydrologic response aligns with the assumptions in the proposed stormwater management plan. To address the temporary increase in runoff during the construction phase, an interim stormwater management strategy should be implemented. The interim stormwater management plan must be developed during the later phases of the project as part of construction management plan, in close collaboration with the Contractor, to ensure it fully aligns with the planned construction sequencing, staging, and on-site operational constraints.

This strategy may incorporate the following measures:

- Soil management practices to minimize runoff and enhance infiltration.
- Site water management.
- Stormwater detention facilities to reduce peak discharge rates.
- Vegetated buffer zones to improve water quality treatment of site runoff.

4.2 Stormwater Management Post-Construction

4.2.1 *Assessment of Impacts*

The potential changes in impervious surface coverage and their corresponding effects on stormwater runoff rates were evaluated using the Rational Method for both existing and proposed site conditions. A comparative analysis was conducted to identify any variations in runoff characteristics resulting from the revised imperviousness within the Project Location.

As highlighted in Hydrologic Response of Solar Farms (Cook and McCuen; Journal of Hydrologic Engineering, May 2013), solar panels mounted on racks above vegetated ground do not significantly increase site imperviousness. Consequently, they have negligible impact on runoff volumes, peak discharge rates, or time to peak for solar farm developments. This finding supports the assumption that the hydrologic response of such installations remains largely similar to pre-development conditions.

Under the existing condition, the project location remains undeveloped and is primarily characterized by pasture and cultivated land interspersed with areas of woodland. Based on land-use characteristics, an existing area-weighted runoff coefficient (C) of 0.42 was

calculated for the entire project location, reflecting its predominantly pervious nature. Table 4-1 provides a breakdown of land use within the catchment areas of the Project Location under the pre-development conditions.

Table 4-1: Pre-Development Land Use and Runoff Coefficient

Component	Runoff Coefficient	Area (ha)
Pasture	0.40	195.10
Woodland	0.35	57.71
Agriculture	0.55	61.96
Area Weighted Runoff Coefficient	0.42	

For the proposed condition, the addition of impervious surfaces, such as inverter pads, associated structures, the gravel access road/substation, is anticipated to slightly increase the overall runoff coefficient, which could result in slightly increased peak discharge rates. The calculated runoff coefficient for the post-development conditions was calculated at 0.43, indicating that the change is minimal and does not result in a significant runoff increase compared to existing conditions. The runoff coefficient was calculated using a weighted average, accounting for the added impervious areas. This approach ensures that each land-use type such as pasture, woodland, gravel road, and structural areas contributes to the overall coefficient based on its respective area and hydrologic characteristics.

Table 4-2 provides a breakdown of land use within the catchment areas of the project location under the proposed development scenario.

Table 4-2: Post-Development Land Use and Runoff Coefficient

Component	Runoff Coefficient	Area (ha)
Impervious Area	0.95	1.60
Semi-Pervious Area	0.60	7.61
Native Vegetation (Beneath Panels)	0.40	305.55
Area Weighted Runoff Coefficient	0.43	

Table 4-2 shows the baseline values for the proposed conditions, which were adjusted to account for higher storm events in the peak runoff calculations, following the guidelines of the Ontario Ministry of Transportation (MTO) Drainage Design Manual (1997).

4.2.2 Design Storms

Runoff calculations for the Project Location were performed by modeling both the existing conditions and the post-development scenario under a 100-yr design storm event. These simulations aimed to quantify peak flows, runoff volumes, and evaluate the effectiveness of stormwater management measures to ensure compliance with regulatory requirements and long-term site stability.

Considering that the project is expected to operate for approximately 35 years, the selection of rainfall inputs for hydrologic modeling was aligned with both current and future climate conditions. Runoff for the existing (pre-development) condition was calculated using the 2026 inflow design flood (IDF) curves, and for the post-development condition, the 2061 IDF curves were applied to incorporate anticipated increases in rainfall intensity associated with climate change.

Appendix A presents the IDF information for the project location, derived from the MTO's data for the years 2026 and 2061. Also, according to the Table 1 in Appendix A, the rainfall intensities for a 100-yr return period with the times of concentrations for each catchment are shown for the pre-development and post-development conditions, respectively.

4.2.3 **Hydrologic Analysis**

A hydrologic analysis was carried out to characterize peak flows and runoff volumes under existing project location conditions and post-development conditions, to assess stormwater management strategies.

Using the Rational Method, the estimated peak runoff from the project catchments under both existing and proposed conditions has been calculated and summarized in Table 4-3. This comparison provides insight into how land-use changes influence peak discharge rates.

The analysis was based on several key parameters, including runoff coefficients, rainfall intensity (for the 100-yr return period), and drainage area, which collectively determine the hydrologic response of the project location:

- Rainfall intensity based on IDF data at Fort Frances, Ontario [48°39'45"N, 93°32'14"W (48.6625,-93.5375)].
- Time of concentration = varies based on Bransby-Williams Equation (see Appendix A).

The hydrologic modeling results indicate that the most pronounced variation in peak discharge occurs within Catchment 2, where post-development conditions yield an approximate 8.1% increase in peak flow relative to existing conditions. However, Catchment 2 only amounts to 6% of the overall project catchment area. When evaluated on a weighted average percent change across entire project location, the change in post-development runoff relative to existing is 3.32%, reflecting a minor overall change. It means that the increase remains low and does not result in any meaningful change to the overall hydrologic response or downstream conveyance system.

For the remaining catchments, the corresponding changes in peak flow are insignificant, as summarized in Table 4-3. These findings confirm that the site modifications do not materially alter the overall hydrologic behavior of those drainage areas, nor do they meaningfully influence their runoff generation or conveyance characteristics under post-development conditions.

Table 4-3: Peak Flows and Changes

Catchment	Area, A (ha)	Intensity (Pre- Development) (mm/h)	Intensity (Post- Development) (mm/h)	Runoff Coefficient (Existing), C	Runoff Coefficient (Proposed), C	Peak Flow (Existing) (m ³ /s)	Peak Flow (Proposed) (m ³ /s)	Percent Change
1	9.33	73	74.27	0.395	0.403	0.75	0.78	3.7
2	19.34	74.1	75.35	0.458	0.486	1.82	1.97	8.1
3	15.81	76.2	77.52	0.430	0.435	1.44	1.48	2.9
EXT 1	8.54	68.7	69.93	0.324	0.324	0.53	0.54	1.8
EXT 2	8.96	63.4	64.52	0.374	0.374	0.59	0.60	1.8
4	30.30	77.3	78.6	0.460	0.464	2.99	3.07	2.5
5	7.97	118.4	120.23	0.475	0.475	1.25	1.27	1.5
6	26.23	108	109.69	0.394	0.402	3.10	3.21	3.6
7	32.98	118.4	120.23	0.398	0.405	4.32	4.47	3.5
8	2.36	180.2	182.6	0.550	0.551	0.65	0.66	1.6
9	39.95	71.9	73.18	0.404	0.412	3.23	3.34	3.6
10	14.05	81.6	82.93	0.400	0.408	1.27	1.32	3.7
11	39.38	64.4	65.6	0.464	0.466	3.27	3.35	2.4
12	22.59	81.6	82.93	0.381	0.388	1.95	2.02	3.7
13	36.97	104.5	106.18	0.420	0.426	4.52	4.64	2.8

However, ongoing monitoring and verification during detailed design are recommended to ensure compliance with regulatory standards and to address any future changes in project location conditions.

4.2.4 Stabilization Vegetation

All disturbed areas will be stabilized using a permanent restoration seed mix in accordance with Ontario Provincial Standard Specification (OPSS) 803, which governs the application of vegetative cover and requires certified seed mixes with verified composition, purity, and germination. Seeding will occur on properly prepared final grades under suitable weather conditions following OPSS 802 requirements. Application rates will follow OPSS 803 Table 5, and vegetation establishment will be confirmed after 60 days, requiring uniform ground cover with no more than 10% bare areas.

Full establishment of restoration vegetation may require several growing seasons. Until adequate stabilization is achieved, temporary ESC measures will remain in place. Once vegetation is sufficiently established to provide long-term stabilization, these temporary measures will be removed and disposed of off-site.

4.2.5 Water Quality Control

Although the Project Location is not expected to generate significant changes to concentrations of total suspended solids (TSS) or other pollutants, a transformer oil containment strategy for the substation will be implemented to prevent oil migration in case of a leak.

The containment system will be designed to accommodate total oil volume stored at the substation. Primary containment will be provided by an enclosure installed on a concrete pad, sized and designed to safely retain the anticipated oil volume. The need for additional secondary containment measures, if any, will be evaluated during the detailed design phase based on risk, regulatory requirements, and final equipment configuration.

Additionally, an oil grit separator will be installed on-site to enhance water quality by removing sediments and hydrocarbons from stormwater runoff. Detailed specifications for the spill containment system will be finalized during the detailed design phase.

Medium-voltage transformers at the inverter stations may utilize non-toxic, biodegradable transformer oil - primarily natural or synthetic ester organic vegetable-based oils, when possible.

5. Stormwater Management Maintenance and Monitoring

The proposed stormwater management approach emphasizes passive, low-maintenance practices designed to align with straightforward operational requirements. The Owner's responsibilities for inspection, operation, and maintenance will generally include:

- **Annual Site Inspections:** Conduct walking inspections annually to identify areas of bare soil or erosion. Corrective measures may involve regrading affected areas and reestablishing vegetation using sod or an appropriate seed mix, supplemented with fertilizer and irrigation as needed to ensure germination and stabilization.
- **Sediment Accumulation Review:** During inspections, visually assess areas where sediment has accumulated. Persistent, non-vegetated sediment deposits pose a risk of resuspension and downstream transport. If such conditions are observed, remove excess sediment and restore stabilization.
- **Downstream Perimeter Assessment:** Inspect the entire downstream project location boundary for signs of erosion or concentrated stormwater discharge. Any observed impacts will require the development and implementation of a remediation plan.
- **Vegetation Health Monitoring:** Evaluate the density and vigor of vegetation within grassed waterways during inspections. Poor growth or inadequate coverage may indicate unsuitable species or poor establishment, requiring replanting to achieve sufficient vegetative density.

6. Erosion and Sediment Control Plan

6.1 Site Erosion Potential

An evaluation of the construction area's erosion potential should be conducted in accordance with the methodology outlined in the ESC Guideline (GGHCA, 2006). This assessment considers three key factors – slope gradient, slope length, and soil texture (erodibility) – to classify the site as having “low,” “medium,” or “high” erosion potential. The determined erosion risk, combined with the sensitivity of downstream receptors, will influence the level of detail required in the design, monitoring, and maintenance of the ESC system.

6.2 Erosion and Sediment Control Measures

Construction of the Fort Frances Solar Project will involve activities such as topsoil redistribution, minor grading, and general construction traffic. Without appropriate mitigation, these activities could lead to surface soil disturbance, erosion, and potential sediment transport to off-site areas. Erosion control will be primarily achieved through:

- Implementing soil conservation practices to minimize runoff and sediment transport during construction.
- Installing barriers to filter runoff before discharge.

ESC measures will be in place prior to any grading or servicing activities and may include, but are not limited to, the following:

- **Perimeter Protection:** A light-duty silt fence will be installed along the downstream side of the work limits, concurrent with the construction of the site's chain-link fence, and secured on the upstream side of the permanent fence.
- **Vegetated Buffers:** A 5 m wide vegetated buffer will be maintained downstream of disturbed areas where project location boundaries allow. Existing native vegetation will remain undisturbed, and sparse areas will be reseeded.
- **Construction Entrance:** A stabilized entrance (mud mat) will be provided to minimize sediment tracking by construction vehicles.
- **Stockpile Stabilization:** Topsoil stockpiles left in place for more than 30 days will be stabilized using vegetative cover (e.g., hydroseeding) or erosion control blankets during unfavorable growing conditions.
- **Access Restrictions:** Equipment will not be permitted beyond designated work limits.
- **Concrete Washout Area:** A lined, contained washout area will be provided at least 30 m (approximately 98 ft) from storm drains, open channels/ditches, wetlands, and waterbodies, with no required setbacks from buildings, solar panels, roads, or stormwater management facilities. Regular maintenance and clean-out will be performed to prevent runoff.

- **Material Management:** Temporarily stockpiled fine materials ($D_{50} < 4.75$ mm) will be covered with erosion control products if stored for more than 30 days. Coarser materials ($D_{50} \geq 4.75$ mm) may remain uncovered but will be surrounded by a double light-duty silt fence for added protection.
- **Revegetation:** Disturbed areas anticipated to remain inactive for more than 60 days shall be stabilized. Where permanent revegetation is feasible, areas shall be restored with a minimum 50 mm of topsoil and hydroseeding in accordance with OPSS 804. Where revegetation cannot be completed due to seasonal constraints, construction phasing, or site conditions, temporary non-vegetative stabilization measures (e.g., erosion control blankets or equivalent) shall be implemented and maintained until permanent revegetation can occur.
- **Temporary Berms:** If required, perimeter berms constructed from excavated material will provide temporary stormwater detention and sediment settling.
- **Weather Contingency Measures:** In adverse conditions, best practices such as temporary rig mats will be used to prevent soil and vegetation disturbance by construction equipment.

ESC measures will be maintained in good condition throughout construction and removed only after contributing drainage areas are stabilized. Removal will occur upon confirmation by a qualified ESC inspector that the risk of surface water and environmental impacts is negligible. All inspections, performance evaluations, and any repairs or modifications will be documented in on-site logbooks.

6.3 Erosion and Settlement Control Monitoring Program

To maintain the effectiveness of ESC measures, a structured inspection during the construction period and maintenance program should be implemented. This program will include regular inspections and additional checks following any significant rainfall event, with immediate repair of critical deficiencies. Post-construction monitoring frequency should align with Section 5 above. Non-urgent repairs, those posing no immediate risk of sediment discharge, must be completed within 48 hours of identification or prior to the next forecasted rainfall, whichever occurs first. The program will involve the following activities:

- **Visual Inspection:** Assess ESC measures to confirm that discharged flows are generally free of sediment and turbidity.
- **Condition Review:** Inspect vegetation protection, erosion control blankets, and silt fencing to ensure they remain in good repair.
- **Debris Removal:** Clear any accumulated construction debris that may obstruct ESC performance.

- **Remedial Actions:** Implement corrective measures as needed, including erosion stabilization, repair or replacement of damaged controls, and any additional remediation required to maintain compliance.

6.4 Construction Phase Measures

To protect the quality of receiving waters during construction, an ESC plan will be implemented. The plan will include, but is not limited to, the following measures:

- **Flow Interception:** Install straw bale barriers and/or filter cloth barriers, including light-duty silt fences, within existing swales, drains, or at critical downstream flow points to capture suspended solids and prevent sediment transport into downstream watercourses.
- **Minimized Disturbance:** Strip topsoil only in areas required for solar panel installation, utility servicing, and road construction.
- **Grading Practices:** Apply appropriate grading techniques to maintain positive drainage and reduce the potential for increased runoff.

A detailed construction-stage ESC plan will be prepared in later phases of the project in close coordination with the selected contractor. This plan will refine the preliminary measures outlined in this report and ensure that ESC practices are appropriately tailored to the contractor's methods, construction sequencing, and site-specific conditions.

7. Conclusion and Recommendations

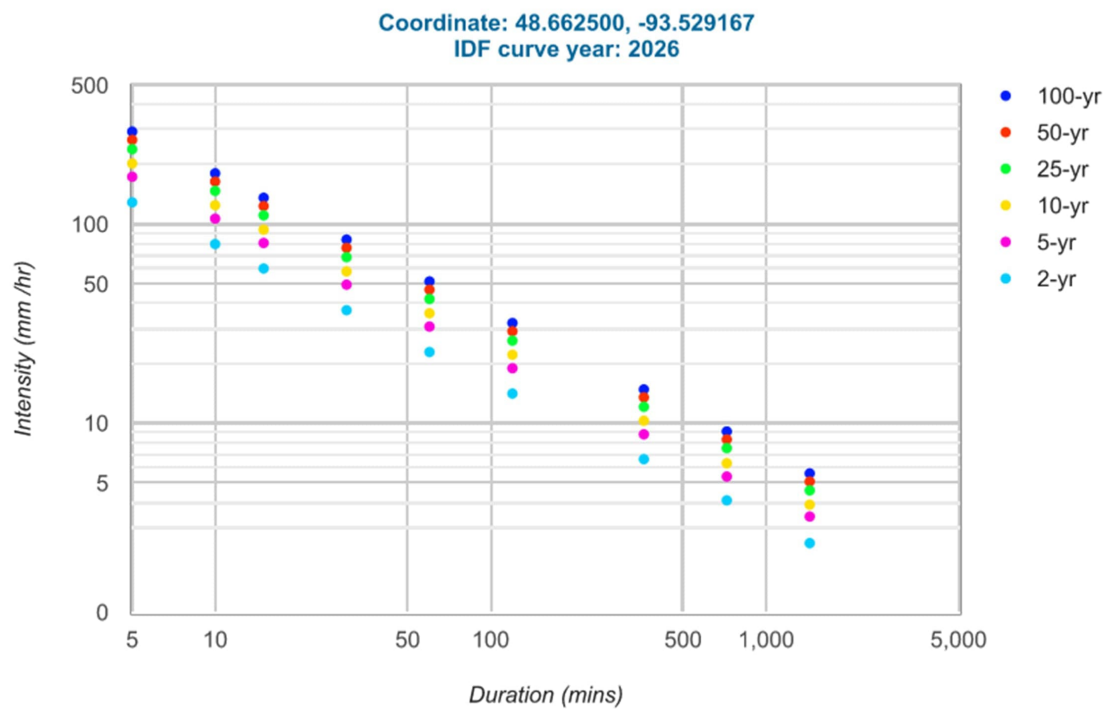
A preliminary stormwater management approach has been outlined for the proposed CarbonFree Fort Frances Project to guide future design and ensure appropriate runoff control during construction and eventual operations. Based on the anticipated project location layout and the minimal change in impervious area between existing and post-development conditions, no formal structural stormwater management measures are expected to be required at this stage. The stormwater measures implemented during the construction period will minimize the potential erosion, and water quality impacts during site preparation and construction activities. The post-construction strategy incorporates the use of vegetated buffers and site-wide stabilization plantings to promote infiltration, minimize erosion, and maintain stable drainage patterns. Based on the present development conditions, no formal structural stormwater management measures are expected to be required at this stage. The project has also consistently implemented a standard 30 m setback between construction activities and adjacent sensitive environmental features, including wetlands and watercourses. This setback strategy enhances the protection of environmentally significant areas and is aligned with best management practices applied throughout the project.

The following recommendations are provided to guide future design phases and project execution:

- The stormwater management considerations described in this report should be implemented during detailed design and constructed once finalized.
- All ESC practices identified herein should be applied throughout construction to protect downstream systems.
- A stormwater monitoring and maintenance program should be carried out during construction and continued through early operations to ensure long-term performance.

Appendix A

IDF Table for Fort Frances



Coefficient summary

IDF Curve: 48° 39' 45" N, 93° 31' 45" W (48.662500,-93.529167)

Retrieved: Mon, 23 Feb 2026 05:49:07 GMT

Data year: 2010

IDF curve year: 2026

Statistics

Rainfall intensity (mm hr⁻¹)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	128.8	79.5	59.9	37.0	22.8	14.1	6.6	4.1	2.5
5-yr	173.1	106.7	80.5	49.7	30.6	18.9	8.8	5.4	3.4
10-yr	202.0	124.6	93.9	57.9	35.7	22.1	10.3	6.3	3.9
25-yr	238.4	147.0	110.8	68.3	42.1	26.0	12.1	7.5	4.6
50-yr	265.6	163.8	123.4	76.1	46.9	29.0	13.5	8.3	5.1
100-yr	292.3	180.2	135.8	83.7	51.6	31.9	14.8	9.1	5.6

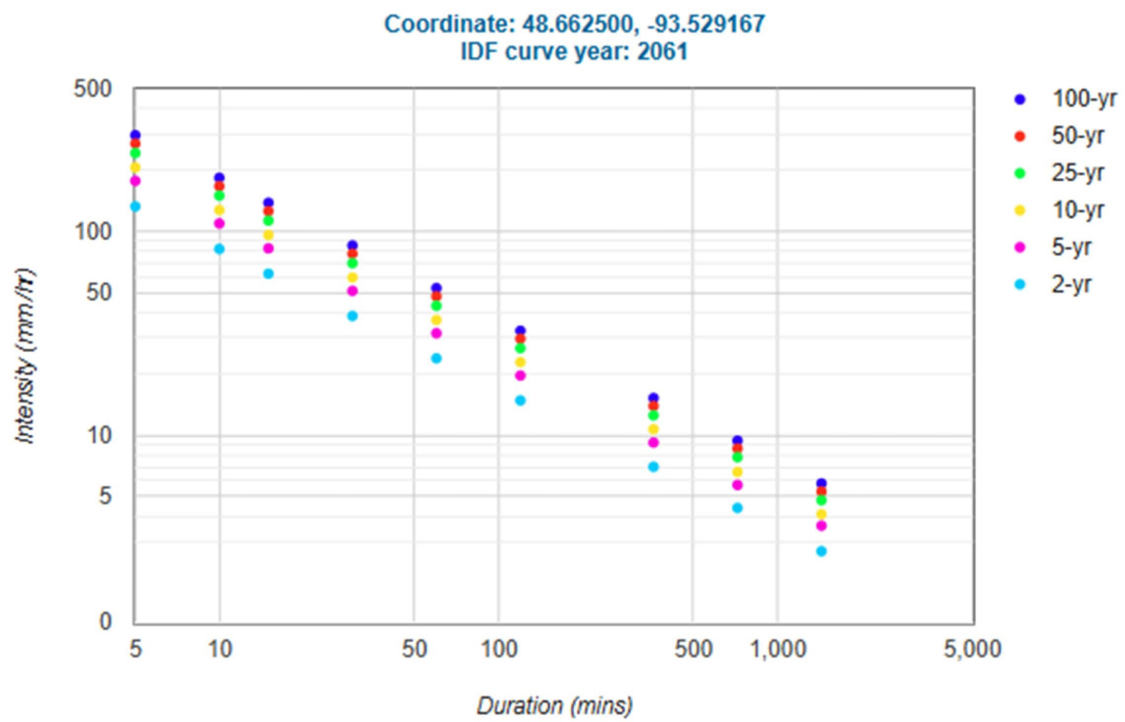
Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	10.7	13.3	15.0	18.5	22.8	28.2	39.6	49.2	60.0
5-yr	14.4	17.8	20.1	24.9	30.6	37.8	52.8	64.8	81.6
10-yr	16.8	20.8	23.5	28.9	35.7	44.2	61.8	75.6	93.6
25-yr	19.9	24.5	27.7	34.1	42.1	52.0	72.6	90.0	110.4
50-yr	22.1	27.3	30.9	38.0	46.9	58.0	81.0	99.6	122.4
100-yr	24.4	30.0	34.0	41.9	51.6	63.8	88.8	109.2	134.4

Terms of Use

You agree to the [Terms of Use](#) of this site by reviewing, using, or interpreting these data.

[Ontario Ministry of Transportation](#) | [Terms and Conditions](#) | [About](#)
Last Modified: September 2016



Coefficient summary

Data year: 2010
IDF curve year: 2061

Click a return period in the table header for more detail.

Statistics

Rainfall intensity (mm hr⁻¹)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	132.1	81.8	61.9	38.4	23.8	14.8	7.0	4.4	2.7
5-yr	176.4	109.1	82.4	51.0	31.6	19.6	9.2	5.7	3.6
10-yr	205.4	127.0	95.8	59.3	36.7	22.8	10.7	6.6	4.1
25-yr	241.7	149.4	112.7	69.7	43.1	26.7	12.5	7.8	4.8
50-yr	269.0	166.1	125.4	77.5	47.9	29.7	13.9	8.6	5.3
100-yr	295.7	182.6	137.8	85.1	52.6	32.5	15.2	9.4	5.8

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	11.0	13.6	15.5	19.2	23.8	29.6	42.0	52.8	64.8
5-yr	14.7	18.2	20.6	25.5	31.6	39.2	55.2	68.4	86.4
10-yr	17.1	21.2	23.9	29.6	36.7	45.6	64.2	79.2	98.4
25-yr	20.1	24.9	28.2	34.9	43.1	53.4	75.0	93.6	115.2
50-yr	22.4	27.7	31.4	38.8	47.9	59.4	83.4	103.2	127.2
100-yr	24.6	30.4	34.5	42.5	52.6	65.0	91.2	112.8	139.2

Terms of Use

You agree to the [Terms of Use](#) of this site by reviewing, using, or interpreting these data.

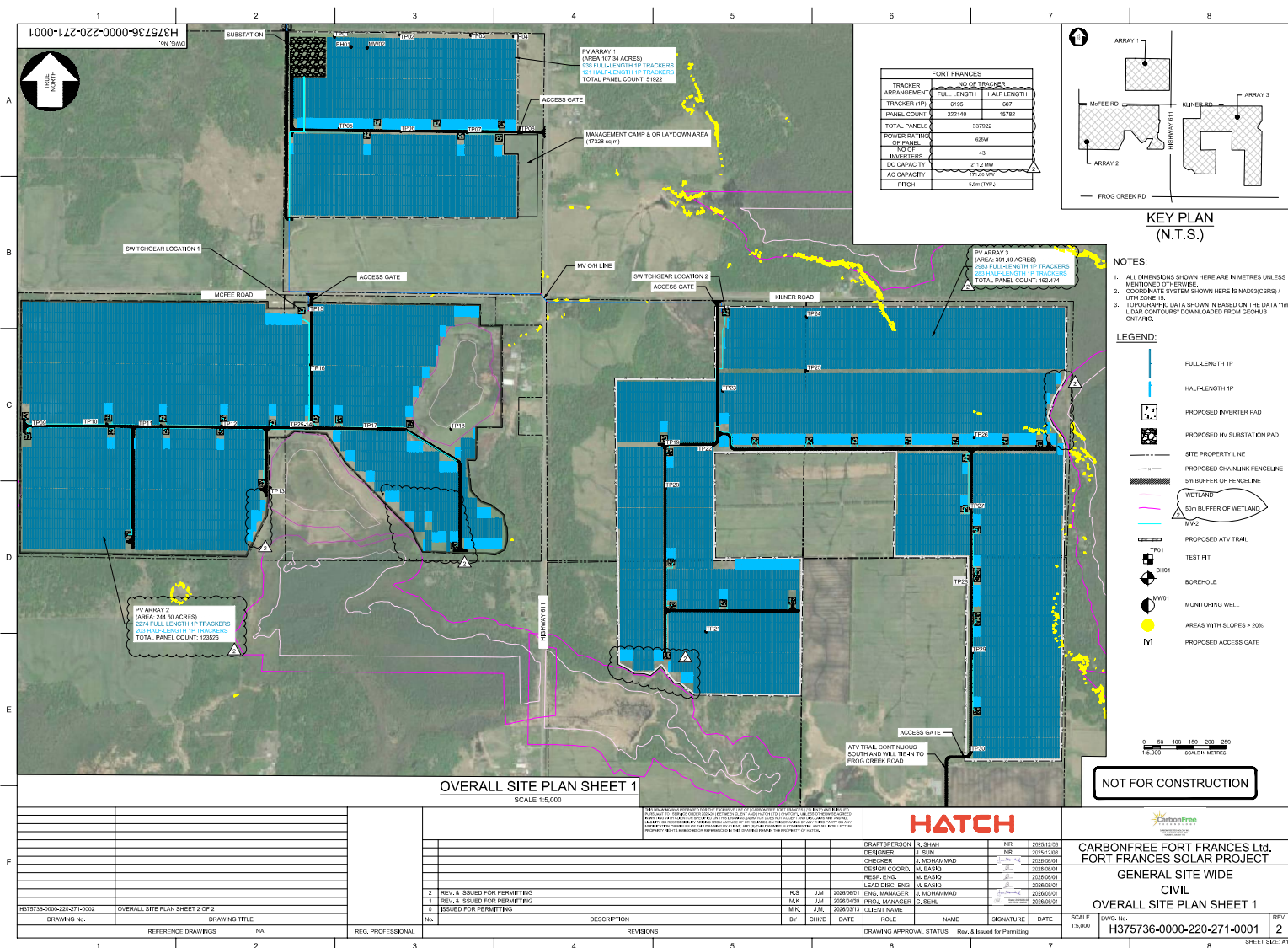
[Ontario Ministry of Transportation](#) | [Terms and Conditions](#) | [About](#)
Last Modified: September 2016

Table 1

Catchment	L(m)	S	Area (ha)	Tc(min)	Tc(Final)	Intensity_year 2026(mm/hr)	Intensity_year 2061(mm/hr)
1	807	0.63	9.33	40.35	40	73	74.27
2	890	0.88	19.34	38.70	39	74.1	75.35
3	825	0.89	15.81	36.52	37	76.2	77.52
EXT 1	900	0.78	8.54	43.51	44	68.7	69.93
EXT 2	1029	0.82	8.96	49.01	49	63.4	64.52
4	703	0.32	30.3	35.78	36	77.3	78.6
5	406	0.66	7.97	20.43	20	118.4	120.23
6	467	0.38	26.23	23.30	23	108	109.69
7	530	1.26	32.98	20.34	20	118.4	120.23
8	200	1.09	2.36	10.28	10	180.2	182.6
9	980	0.71	39.95	41.37	41	71.9	73.18
10	783	1.43	14.05	31.90	32	81.6	82.93
11	1250	1.19	39.38	47.66	48	64.4	65.6
12	690	0.62	22.59	31.69	32	81.6	82.93
13	622	1.28	36.97	23.52	24	104.5	106.18

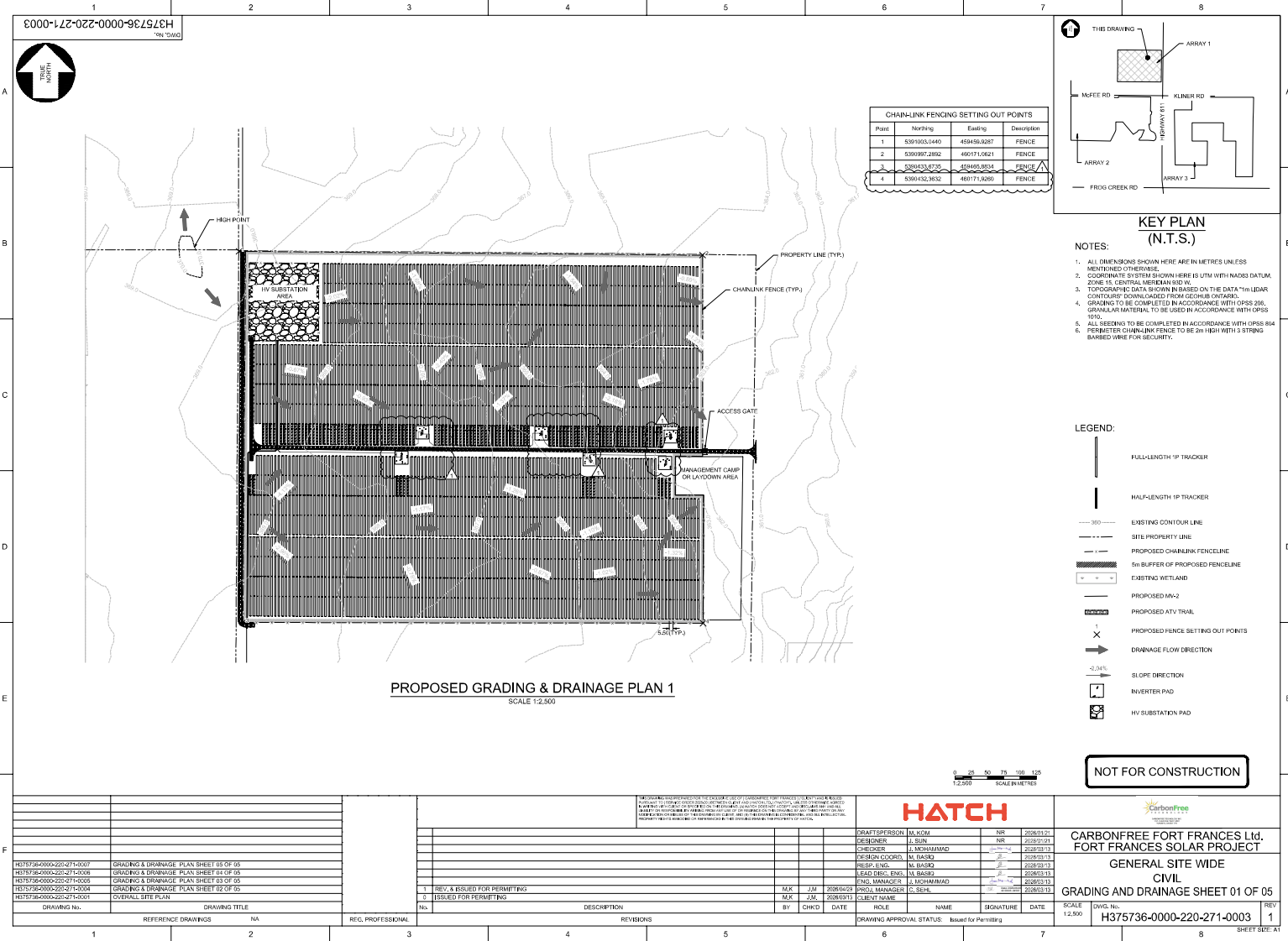
Appendix B

Overall Site Plan

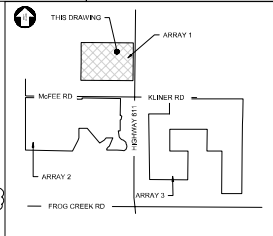


Appendix C

Grading and Drainage Plan



CHAIN-LINK FENCING SETTING OUT POINTS			
Post	Northing	Easting	Description
1	5391003.4440	488456.9287	FENCE
2	5390997.2892	490171.0621	FENCE
3	5390431.6735	488465.9834	FENCE
4	5390432.3632	490171.9280	FENCE



- KEY PLAN (N.T.S.)**
- NOTES:**
1. ALL DIMENSIONS SHOWN HERE ARE IN METRES UNLESS MENTIONED OTHERWISE.
 2. COORDINATE SYSTEM SHOWN HERE IS UTM WITH NAD83 DATUM, ZONE 18, CENTRAL MERIDIAN 94°W.
 3. TOPOGRAPHIC DATA SHOWN IS BASED ON THE DATA 1m LIDAR CONTOUR DOWNGRADES FROM GEBCO (DATED).
 4. GRADING TO BE COMPLETED IN ACCORDANCE WITH OPSS 208, GRADUAL RATIONAL TO BE USED IN ACCORDANCE WITH OPSS 1010.
 5. ALL SEEDINGS TO BE COMPLETED IN ACCORDANCE WITH OPSS 504.
 6. PERMETER CHAIN-LINK FENCE TO BE 2m HIGH WITH 3 STRING BARBED WIRE FOR SECURITY.

- LEGEND:**
- FULL-LENGTH 1P TRACKER
 - HALF-LENGTH 1P TRACKER
 - EXISTING CONTOUR LINE
 - SITE PROPERTY LINE
 - PROPOSED CHAIN-LINK FENCE LINE
 - 5m BUFFER OF PROPOSED FENCE LINE
 - EXISTING WETLAND
 - PROPOSED MAX-2
 - PROPOSED ATV TRAIL
 - PROPOSED FENCE SETTING OUT POINTS
 - DRAINAGE FLOW DIRECTION
 - SLOPE DIRECTION
 - INVERTER PAD
 - HV SUBSTATION PAD

PROPOSED GRADING & DRAINAGE PLAN 1
SCALE 1:2,500

0 25 50 75 100 125
1:2,500
SCALE IN METRES

NOT FOR CONSTRUCTION

NOT TO BE USED FOR CONSTRUCTION OF ANY STRUCTURE OR FOR ANY OTHER PURPOSE. THIS DRAWING IS THE PROPERTY OF HATCH AND IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREIN. IT IS NOT TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, WITHOUT THE WRITTEN PERMISSION OF HATCH. HATCH ASSUMES NO LIABILITY FOR ANY ERRORS OR OMISSIONS IN THIS DRAWING. THE USER OF THIS DRAWING SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AUTHORITIES.

HATCH



CARBONFREE FORT FRANCES Ltd.
FORT FRANCES SOLAR PROJECT

GENERAL SITE WIDE CIVIL
GRADING AND DRAINAGE SHEET 01 OF 05

DRAWING NO.	REFERENCE DRAWINGS	DRAWING TITLE
1	NA	OVERALL SITE PLAN
2	NA	GRADING & DRAINAGE PLAN SHEET 01 OF 05
3	NA	GRADING & DRAINAGE PLAN SHEET 02 OF 05
4	NA	GRADING & DRAINAGE PLAN SHEET 03 OF 05
5	NA	GRADING & DRAINAGE PLAN SHEET 04 OF 05
6	NA	GRADING & DRAINAGE PLAN SHEET 05 OF 05

REV.	DESCRIPTION	DATE	BY	CHKD	DATE	ROLE	NAME	SIGNATURE	DATE
1	REV. & ISSUED FOR PERMITTING	2020/03/13	NK	JM	2020/03/13	CLIENT NAME	C. SELH		2020/03/13
2	ISSUED FOR PERMITTING	2020/03/13	NK	JM	2020/03/13	CLIENT NAME	C. SELH		2020/03/13

NO.	DESCRIPTION	REV.	DATE	BY	CHKD	DATE	ROLE	NAME	SIGNATURE	DATE
1	DESIGNER	1	2020/03/13	NK	JM	2020/03/13	DESIGNER	A. SUN		2020/03/13
2	CHECKER	1	2020/03/13	NK	JM	2020/03/13	CHECKER	A. MOHAMMAD		2020/03/13
3	DESIGN COORD.	1	2020/03/13	NK	JM	2020/03/13	DESIGN COORD.	M. BAKSI		2020/03/13
4	RESP. ENGR.	1	2020/03/13	NK	JM	2020/03/13	RESP. ENGR.	M. BAKSI		2020/03/13
5	LEAD DESIG. ENGR.	1	2020/03/13	NK	JM	2020/03/13	LEAD DESIG. ENGR.	M. BAKSI		2020/03/13
6	ENR. MANAGER	1	2020/03/13	NK	JM	2020/03/13	ENR. MANAGER	A. MOHAMMAD		2020/03/13
7	PROJ. MANAGER	1	2020/03/13	NK	JM	2020/03/13	PROJ. MANAGER	C. SELH		2020/03/13

DRAWING APPROVAL STATUS: Issued for Permitting

DWG. NO. H375736-0000-220-271-0003
SHEET 01 OF 05



CHAINLINK FENCING SETTING OUT POINTS			
Point	Nothing	Existing	Description
17	538975.6645	45956.3759	FENCE
18	538985.3760	45963.3751	FENCE
19	538935.2903	45974.9036	FENCE
21	538942.9474	45989.2215	FENCE
24	538941.1463	45976.5377	FENCE
25	538942.7551	46012.7145	FENCE
26	538948.1856	46013.8162	FENCE
27	538954.9708	460136.7075	FENCE
28	538956.5806	46006.13186	FENCE
29	538956.6575	460075.4655	FENCE
30	538991.9537	46019.2190	FENCE
31	538997.7518	46045.5454	FENCE
32	538975.2339	46046.5615	FENCE
33	538970.2339	46013.7336	FENCE
34	538104.6079	46013.7336	FENCE
35	538104.6079	46057.3756	FENCE
36	538168.7628	46057.3756	FENCE
37	538163.5453	46073.3540	FENCE
38	538943.8352	46073.3540	FENCE
39	538944.6517	46047.0019	FENCE
40	538933.8601	46073.3540	FENCE
41	538113.1807	46074.1812	FENCE

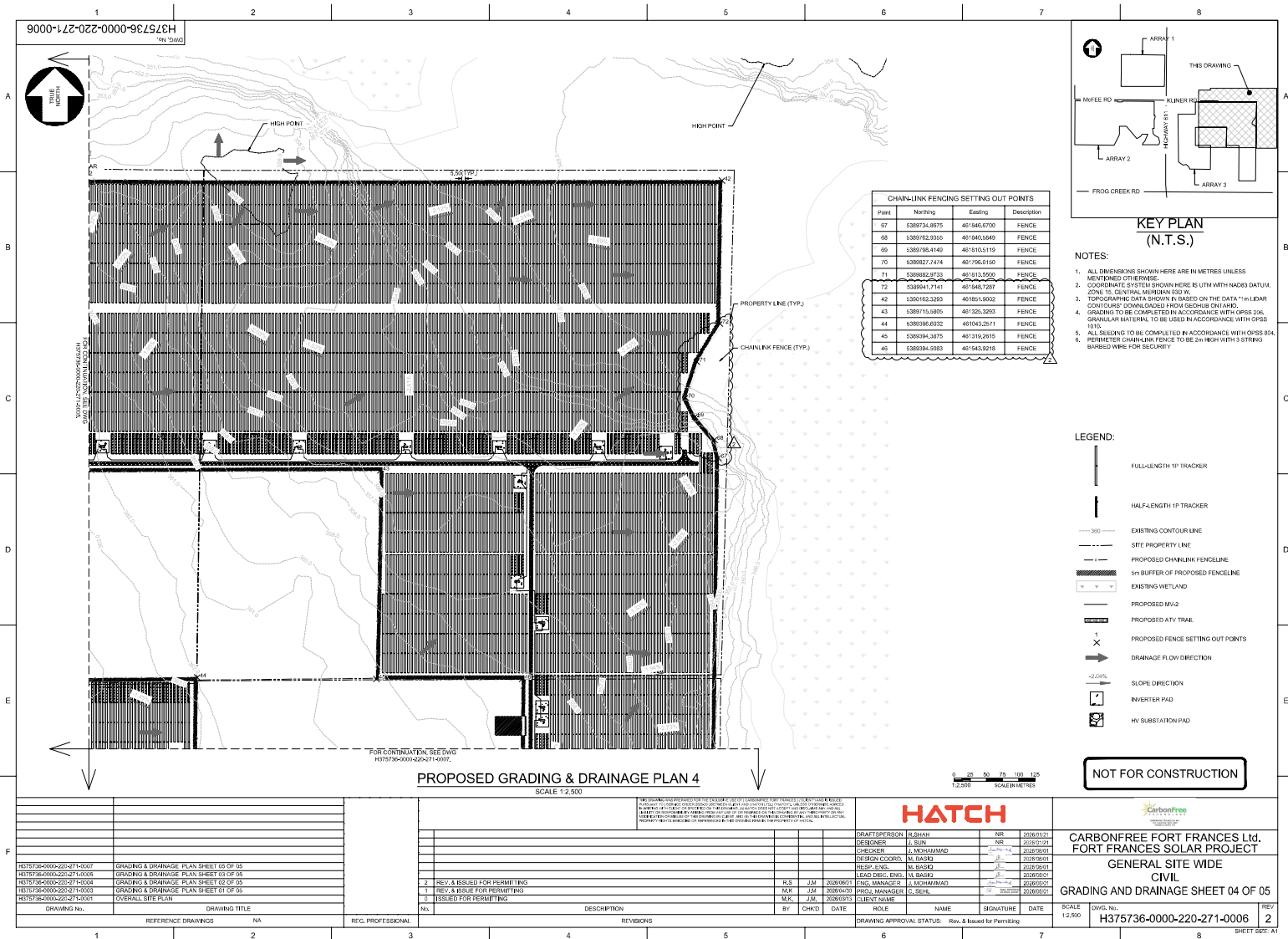
KEY PLAN
(N.T.S.)

NOTES:
1. ALL DIMENSIONS SHOWN HERE ARE IN METRES UNLESS MENTIONED OTHERWISE.
2. COORDINATE SYSTEM SHOWN HERE IS UTM WITH HADRS DATUM, ZONE 18, CENTRAL, MERIDIAN 830 W.
3. TOPOGRAPHIC DATA SHOWN IS BASED ON THE DATA "ULAR CONTOURS" DOWNLOADED FROM GEOHLB ONTARIO.
4. GRADING TO BE COMPLETED IN ACCORDANCE WITH CPSS 205. GRANULAR MATERIAL TO BE USED IN ACCORDANCE WITH CPSS 1015.
5. ALL SEEDING TO BE COMPLETED IN ACCORDANCE WITH CPSS 101.
6. PERIMETER CHAINLINK FENCE TO BE 5m HIGH WITH 3 STRING BARBED WIRE FOR SECURITY.

LEGEND:
FULL-LENGTH 1P TRACKER
HALF-LENGTH 1P TRACKER
EXISTING CONTOUR LINE
SITE PROPERTY LINE
PROPOSED CHAINLINK FENCING
5m BUFFER OF PROPOSED FENCELINE
EXISTING WETLAND
PROPOSED MV-2
PROPOSED ATV TRAIL
PROPOSED FENCE SETTING OUT POINTS
DRAINAGE FLOW DIRECTION
SLOPE DIRECTION
INVERTER PAD
HV SUBSTATION PAD

NOT FOR CONSTRUCTION

DRAWING NO.		REFERENCE DRAWINGS	DRAWING TITLE	NA	REF. PROFESSIONAL	REV.		DESCRIPTION	BY	CHKD	DATE	ROLE	NAME	SIGNATURE	DATE	SCALE	DWG. NO.	REV	SHEET NO.
H375736-0000-220-271-0005			OVERALL SITE PLAN			1		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0005	2	2
H375736-0000-220-271-0007			GRADING & DRAINAGE PLAN SHEET 03 OF 05			2		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0007	2	2
H375736-0000-220-271-0008			GRADING & DRAINAGE PLAN SHEET 04 OF 05			3		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0008	2	2
H375736-0000-220-271-0009			GRADING & DRAINAGE PLAN SHEET 05 OF 05			4		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0009	2	2
H375736-0000-220-271-0010			GRADING & DRAINAGE PLAN SHEET 06 OF 05			5		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0010	2	2
H375736-0000-220-271-0011			GRADING & DRAINAGE PLAN SHEET 07 OF 05			6		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0011	2	2
H375736-0000-220-271-0012			GRADING & DRAINAGE PLAN SHEET 08 OF 05			7		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0012	2	2
H375736-0000-220-271-0013			GRADING & DRAINAGE PLAN SHEET 09 OF 05			8		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0013	2	2
H375736-0000-220-271-0014			GRADING & DRAINAGE PLAN SHEET 10 OF 05			9		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0014	2	2
H375736-0000-220-271-0015			GRADING & DRAINAGE PLAN SHEET 11 OF 05			10		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0015	2	2
H375736-0000-220-271-0016			GRADING & DRAINAGE PLAN SHEET 12 OF 05			11		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0016	2	2
H375736-0000-220-271-0017			GRADING & DRAINAGE PLAN SHEET 13 OF 05			12		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0017	2	2
H375736-0000-220-271-0018			GRADING & DRAINAGE PLAN SHEET 14 OF 05			13		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0018	2	2
H375736-0000-220-271-0019			GRADING & DRAINAGE PLAN SHEET 15 OF 05			14		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0019	2	2
H375736-0000-220-271-0020			GRADING & DRAINAGE PLAN SHEET 16 OF 05			15		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0020	2	2
H375736-0000-220-271-0021			GRADING & DRAINAGE PLAN SHEET 17 OF 05			16		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0021	2	2
H375736-0000-220-271-0022			GRADING & DRAINAGE PLAN SHEET 18 OF 05			17		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0022	2	2
H375736-0000-220-271-0023			GRADING & DRAINAGE PLAN SHEET 19 OF 05			18		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0023	2	2
H375736-0000-220-271-0024			GRADING & DRAINAGE PLAN SHEET 20 OF 05			19		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0024	2	2
H375736-0000-220-271-0025			GRADING & DRAINAGE PLAN SHEET 21 OF 05			20		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0025	2	2
H375736-0000-220-271-0026			GRADING & DRAINAGE PLAN SHEET 22 OF 05			21		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0026	2	2
H375736-0000-220-271-0027			GRADING & DRAINAGE PLAN SHEET 23 OF 05			22		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0027	2	2
H375736-0000-220-271-0028			GRADING & DRAINAGE PLAN SHEET 24 OF 05			23		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0028	2	2
H375736-0000-220-271-0029			GRADING & DRAINAGE PLAN SHEET 25 OF 05			24		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0029	2	2
H375736-0000-220-271-0030			GRADING & DRAINAGE PLAN SHEET 26 OF 05			25		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0030	2	2
H375736-0000-220-271-0031			GRADING & DRAINAGE PLAN SHEET 27 OF 05			26		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0031	2	2
H375736-0000-220-271-0032			GRADING & DRAINAGE PLAN SHEET 28 OF 05			27		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0032	2	2
H375736-0000-220-271-0033			GRADING & DRAINAGE PLAN SHEET 29 OF 05			28		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0033	2	2
H375736-0000-220-271-0034			GRADING & DRAINAGE PLAN SHEET 30 OF 05			29		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0034	2	2
H375736-0000-220-271-0035			GRADING & DRAINAGE PLAN SHEET 31 OF 05			30		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0035	2	2
H375736-0000-220-271-0036			GRADING & DRAINAGE PLAN SHEET 32 OF 05			31		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0036	2	2
H375736-0000-220-271-0037			GRADING & DRAINAGE PLAN SHEET 33 OF 05			32		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0037	2	2
H375736-0000-220-271-0038			GRADING & DRAINAGE PLAN SHEET 34 OF 05			33		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0038	2	2
H375736-0000-220-271-0039			GRADING & DRAINAGE PLAN SHEET 35 OF 05			34		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0039	2	2
H375736-0000-220-271-0040			GRADING & DRAINAGE PLAN SHEET 36 OF 05			35		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0040	2	2
H375736-0000-220-271-0041			GRADING & DRAINAGE PLAN SHEET 37 OF 05			36		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0041	2	2
H375736-0000-220-271-0042			GRADING & DRAINAGE PLAN SHEET 38 OF 05			37		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0042	2	2
H375736-0000-220-271-0043			GRADING & DRAINAGE PLAN SHEET 39 OF 05			38		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0043	2	2
H375736-0000-220-271-0044			GRADING & DRAINAGE PLAN SHEET 40 OF 05			39		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0044	2	2
H375736-0000-220-271-0045			GRADING & DRAINAGE PLAN SHEET 41 OF 05			40		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0045	2	2
H375736-0000-220-271-0046			GRADING & DRAINAGE PLAN SHEET 42 OF 05			41		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0046	2	2
H375736-0000-220-271-0047			GRADING & DRAINAGE PLAN SHEET 43 OF 05			42		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0047	2	2
H375736-0000-220-271-0048			GRADING & DRAINAGE PLAN SHEET 44 OF 05			43		REV. & ISSUED FOR PERMITTING	N.S.	J.M.	2020/05/01	PROJ. MANAGER	G. SELH		2020/05/01	1:2,500	H375736-0000-220-271-0048	2	2</





CHAIN-LINK FENCING SETTING OUT POINTS		
Point	Northing	Easting
61	5389011.7179	480648.4936
62	5389062.1761	480609.3160
63	5389034.3662	480577.2628
64	5389036.0997	480577.2687
65	5389040.5233	480577.0180
66	5389067.9006	480477.7830
67	5389207.3468	480668.1364
68	5388973.8894	480710.7888
69	5388970.8437	481038.6494
70	5388773.1659	481538.0132
71	5388773.1651	481634.9030
72	5389054.9000	481643.8918
73	5389054.9000	481643.8918
74	5389054.9000	481643.8918
75	5389054.9000	481643.8918
76	5389054.9000	481643.8918
77	5389054.9000	481643.8918
78	5389054.9000	481643.8918
79	5389054.9000	481643.8918
80	5389054.9000	481643.8918

- NOTES:
1. ALL DIMENSIONS SHOWN HERE ARE IN METRES UNLESS MENTIONED OTHERWISE.
 2. COORDINATE SYSTEM SHOWN HERE IS UTM WITH NAD83 DATUM, ZONE 15, CENTRAL MERIDIAN 830 KM.
 3. TOPOGRAPHIC DATA SHOWN IN BASED ON THE DATA "1m LIDAR CONTOUR" DOWNLOADED FROM GEOLUS ONTARIO.
 4. GRADING TO BE COMPLETED IN ACCORDANCE WITH OPSS 206. GRANULAR MATERIAL TO BE USED IN ACCORDANCE WITH OPSS 1016.
 5. ALL SETTING TO BE COMPLETED IN ACCORDANCE WITH OPSS 804.
 6. FENCING FOR CHAIN-LINK FENCE TO BE 2m HIGH WITH 3 STRING BARBED WIRE FOR SECURITY.

- LEGEND:
- FULL-LENGTH IP TRACKER
 - HALF-LENGTH IP TRACKER
 - EXISTING CONTOUR LINE
 - SITE PROPERTY LINE
 - PROPOSED CHAIN-LINK FENCING
 - 5m BUFFER OF PROPOSED FENCING LINE
 - EXISTING WETLAND
 - PROPOSED MV-2
 - PROPOSED ATV TRAIL
 - PROPOSED FENCE SETTING OUT POINTS
 - DRAINAGE FLOW DIRECTION
 - SLOPE DIRECTION
 - INVERTER PAD
 - HV SUBSTATION PAD

NOT FOR CONSTRUCTION

DRAWING NO.		REFERENCE DRAWINGS		DRAWING TITLE		REV. PROFESSIONAL		DESCRIPTION		REVISIONS		BY		CHKD		DATE		ROLE		NAME		SIGNATURE		DATE		SCALE		DWG. NO.		REV		SHEET SITE AT	
H375736-0000-220-271-0007		NA		OVERALL SITE PLAN		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		1:2,500		H375736-0000-220-271-0007		2		2	

HATCH

CARBONFREE FORT FRANCES Ltd.
FORT FRANCES SOLAR PROJECT
GENERAL SITE WIDE
CIVIL
GRADING AND DRAINAGE SHEET 05 OF 05

Appendix D

Erosion and Sediment Control Plan

