

KINGSTON SOLAR LP
Sol-Luce Kingston Solar PV Energy Project
NHA Environmental Impact Study Addendum



Prepared by Dillon Consulting Limited

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Table of Contents

	Page
1. Introduction	1
2. The Proponent	4
3. Project Location	5
4. Project Summary.....	7
5. Environmental Impact Study Purpose	13
6. Rationale for Development Within a Natural Feature or Setback	14
7. Description of Project Activities.....	15
8. Existing Environmental Conditions of Relevant Natural Features.....	16
8.1 Overview	16
8.2 Description of Natural Features.....	16
8.2.1 Wetlands	16
8.2.2 Woodlands	20
8.2.3 Wildlife Habitat	22
9. Environmental Effects of the Project.....	31
10. Environmental Effects Monitoring Plan.....	58
11. Negative Environmental Effects, Design and Operations.....	65
12. Negative Environmental Effects, Construction.....	66
13. Conclusions	67
14. References	69

List of Figures

Figure 1: General Location of Sol-Luce Kingston Solar PV Energy Project in Ontario	3
Figure 2: Project Location	6
Figure 3: Significant Wetlands and Woodlands.....	17
Figure 4: Significant Wildlife Habitat- Seasonal Concentration Areas.....	23
Figure 5: Significant Wildlife Habitat- Specialised Wildlife Habitat.....	24
Figure 6: Significant Wildlife Habitat- Habitat for Species of Conservation Concern	25

List of Tables

Table 1: Summary of the Natural Heritage Assessment for Sol-luce Kingston Solar PV Energy Project.....	8
Table 2: Evaluation of Wetlands within the Amended Project Location and Surrounding 120 m	18
Table 3: Evaluation of Woodlands within the Amended Project Location and Surrounding 120 m	21
Table 4: Evaluation of Significant Wildlife Habitat in the Amended Project Location and Surrounding 120 metres	26
Table 5: A Summary of Natural Feature Key Features & Function and Other Characteristics that are Sensitive to Development and May Serve as Good Indicators of Negative Environmental Effects.	32
Table 6: Summary of Potential Negative Effects and Mitigation Measures for Significant/Provincially Significant Natural Features.....	37
Table 7: Environmental Effects Monitoring Plan.....	59

Appendix

Appendix A: Pre-Construction Surveys and Post-Construction Monitoring

1. Introduction

Kingston Solar LP proposes to develop a solar facility with a name plate capacity of 100 MW (AC), partially within the City of Kingston boundaries and partially within Loyalist Township (**Figure 1** and **2**). The renewable energy facility will be known as Sol-luce Kingston Solar PV Energy Project and will be rated as a Class 3 solar facility. Kingston Solar LP has received a contract from the Ontario Power Authority (OPA) for the purchase of electricity generated by this renewable energy facility through the Province's Feed-in-Tariff (FIT) program (enabled by the *Green Energy and Green Economy Act*). The project is seeking approval under *Ontario Regulation 359/09 – Renewable Energy Approval (REA or Ontario Regulation 359/09)* under Section V.0.1 of the *Ontario Environmental Protection Act*. For clarity, this report fulfils the requirements of *Ontario Regulation 359/09* as it was in force prior to November 1, 2012.

The Renewable Energy Approval (REA) application was originally submitted for this project on September 18, 2012 and received the 'deemed complete' status by the Ministry of the Environment (MOE) on February 12, 2013. The project was undergoing technical review by the MOE when the review was stopped to accommodate an amendment for the project. The need for an amendment was based on consultation with the host municipalities and was in response to their issued guidelines for Class 3 solar facilities (see Project Modifications Document for more details).

In general, the amendment removed some properties originally proposed for development and included other new sites. The nature of this amendment therefore necessitates further natural environment studies and addendum reports to be drafted. This Natural Heritage Assessment (NHA) Environmental Impact Study Addendum Report is to be read in tandem with the original NHA prepared by AMEC (June 2012) and approved by the Ministry of Natural Resources (MNR) by issue of a confirmation letter on June 11, 2012. It is expected that the Ministry of Natural Resources will provide an updated confirmation letter that addresses both the original and addendum reports for the NHA so the project can ultimately be resubmitted and the MOE's technical review process resumed.

Ontario Regulation 359/09 requires that all renewable energy projects prepare an Environmental Impact Study (EIS) Report to address natural features that have been evaluated to be significant or provincially significant in the Evaluation of Significance Report (REA

Section 38). This NHA EIS Addendum Report was completed to address the regulatory requirements for the REA process and is the fourth and final report in a series that fulfills the requirements of the natural heritage assessment as required by *Ontario Regulation 359/09*. The EIS Addendum Report will detail the potential impacts, mitigation and monitoring requirements to protect natural features within and adjacent to the project location. Discussions regarding Species at Risk are outlined in a separate report, under direction from the MNR and in compliance with *Ontario Regulation 359/09*.



Figure 1: General Location of Sol-Luce Kingston Solar PV Energy Project in Ontario

2. The Proponent

In the course of developing renewable energy projects, Kingston Solar LP strives to satisfy various environmental approval requirements and obtains regulatory approvals that vary depending on the jurisdiction, project capacity and site location. In addition, Kingston Solar LP aims to build long-term relationships with the communities that host its projects. Kingston Solar LP is committed to the health and welfare of the residents of the City of Kingston and Loyalist Township, and to ensuring that Sol-luce Kingston Solar PV Energy Project is successful for stakeholders.

Contact information for the Proponent is as follows:

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Dillon Consulting Limited is the prime contractor for the preparation of this *NHA Environmental Impact Study Addendum Report*. The contact at Dillon is:

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Email:	<u>jpetruniak@dillon.ca</u>

3. Project Location

The proposed Class 3 solar facility is located at several addresses along Unity Road and Mud Lake Road near the City of Kingston in Loyalist Township. Overall, the project location is bounded by Quabbin Road to the North, Mud Lake Road/County Road 19 to the west, Highway 401 to the south, and Highway 38 to the east and is located within the municipal boundaries of the City of Kingston and Loyalist Township. **Figure 1** shows the general location of the project. The planned solar facility will occur primarily within lands currently zoned as “rural area” (City of Kingston Official Plan) and “rural” (Loyalist Township Official Plan).

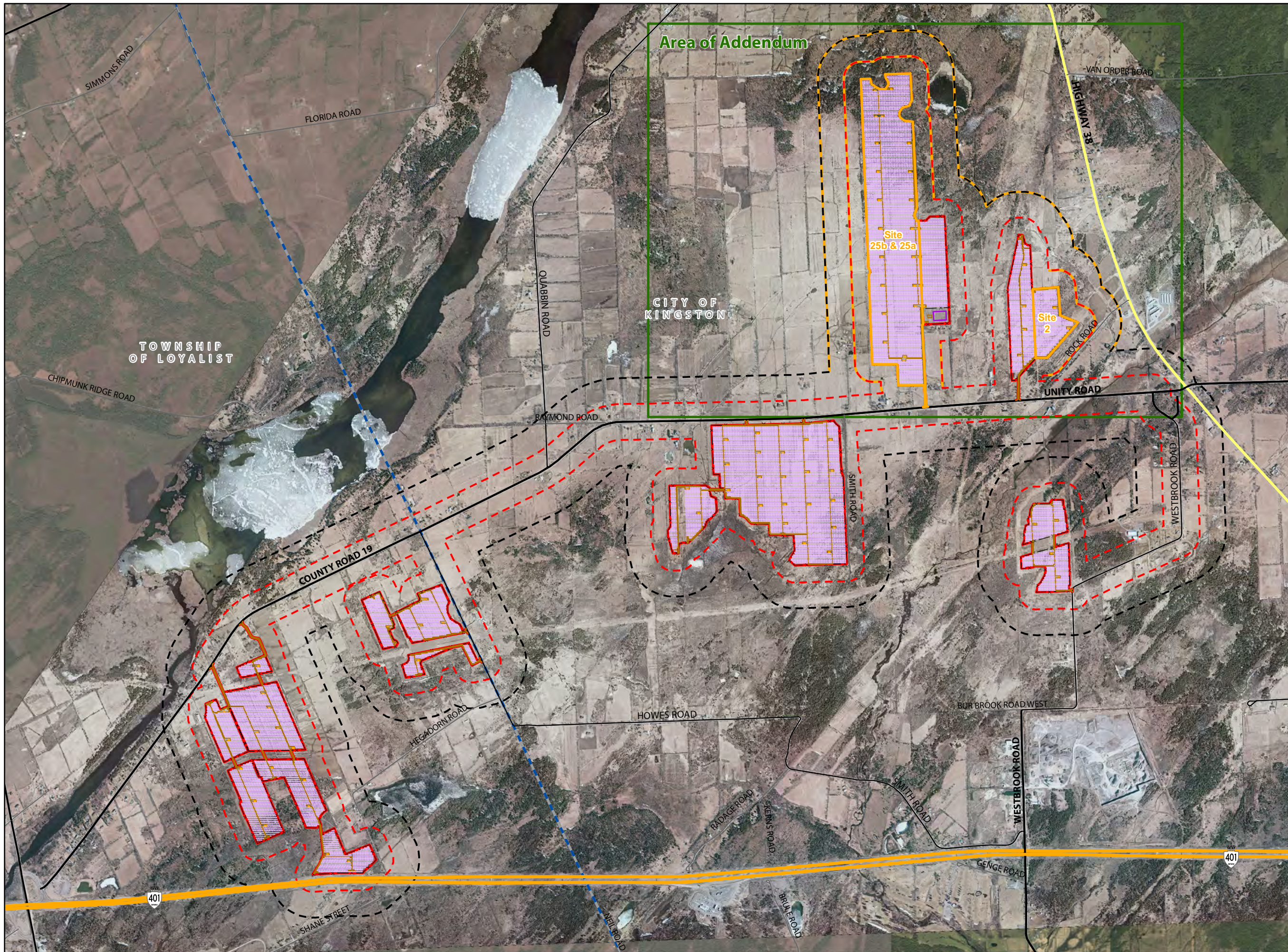
Figure 2 shows the entire project location (as defined in *Ontario Regulation 359/09* to be the location encompassing all projects components) and distinguishes between the previously studied lands that were included in the original NHA and the amended project location. All project components, including solar modules and electrical facilities such as inverters, transformers, substations and electrical lines, will be located on private land or municipal rights-of-way. Specifically, a 34.5 kV collector system of underground and/or overhead power lines and fibre optic cabling will transport outgoing power along access roads on PV array sites and the municipal road allowance to the transformer (substation) or the adjacent switch yard. The substation will connect the project to a 230 kV Hydro One transmission line.

This addendum report solely focuses on the new lands added to the project location (see **Figure 2**) as part of the recent revisions made in response to stakeholder consultation (see Project Modification Document for more information). Amendments to the original NHA (AMEC 2012) are outlined in the NHA Modifications Document.

The three properties added to the Sol-luce Kingston Solar PV Energy Project that are the focus of this NHA Addendum Report are: Site 2, 25a, and 25b (**Figure 2**). Collectively, these are referred to as the amended project location. Within the City of Kingston, Site 2 is north of Rock Road and is to the south of the area previously indicated for development; Sites 25a and 25b are located on Unity Road, approximately 2.2 km east of Quabbin Road.

Sol-luce Kingston Solar PV Energy Project

**Figure 2
Project Location**

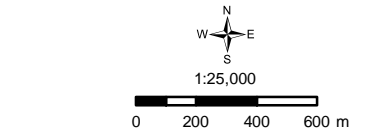
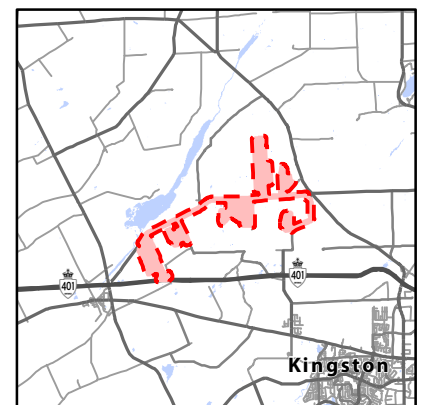


Legend

- Freeway
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Project Location
- Amended Project Location
- 120 m Project Location Setback
- 300 m Project Location Setback
- 120 m Amended Project Location Setback
- 300 m Amended Project Location Setback
- Municipal Boundary

Project Components

- Solar Panels
- Inverters
- Access Road
- Fence
- Substation



4. Project Summary

An evaluation of significance addendum was completed according to Section 27 of *Ontario Regulation 359/09*. This evaluation was preceded by a records review addendum and a site investigation addendum, as per Sections 25 and 26 of *Ontario Regulation 359/09*, respectively. A summary of relevant natural features, detailed in previous reports, is outlined in **Table 1**. This table is the result of all natural heritage assessment work completed for this NHA addendum and identifies all natural features within the amended project location and surrounding 120 meters, including those that have been identified as significant or provincially significant, or will be assumed provincially significant (wetlands) or treated as significant (wildlife habitat) during the natural heritage assessment process and require inclusion in the NHA EIS Addendum.

Table 1: Summary of the Natural Heritage Assessment for Sol-luce Kingston Solar PV Energy Project

Natural Feature	Applicable Project Component(s)	Distance Between Natural Feature and Project Location (metres)	Summary of Natural Heritage Assessment			EIS Required?
			Identified During Records Review?	Identified, Verified or Refined During Site Investigation?	Evaluation of Significance Results	
Provincial Parks and Conservation Reserves						
None identified within the project location or adjacent lands within 300 metres						
ANSI, Life Science						
None identified within the project location or adjacent lands within 300 metres						
ANSI, Earth Science						
None identified within the project location or adjacent lands within 300 metres						
Valleylands						
None identified within the project location or adjacent lands within 300 metres						
Southern Wetlands						
5	n/a	n/a	Yes	Refined	Not Significant	---
8	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	54	Yes	Refined	Assumed Provincially Significant	✓
9	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	33	Yes	Refined	Assumed Provincially Significant	✓
10	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	33	Yes	Refined	Assumed Provincially Significant	✓
11	n/a	n/a	Yes	Refined	Not Significant	---

Sol-luce Kingston Solar PV Energy Project

NHA Addendum

Environmental Impact Study

Natural Feature	Applicable Project Component(s)	Distance Between Natural Feature and Project Location (metres)	Summary of Natural Heritage Assessment			EIS Required?
			Identified During Records Review?	Identified, Verified or Refined During Site Investigation?	Evaluation of Significance Results	
Woodlands						
A (18*)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0	Yes	Refined	Significant	✓
B	n/a	n/a	Yes	Refined	Not Significant	---
C (22*)	n/a	n/a	Yes	Refined	Not Significant	---
Wildlife Habitat						
Seasonal Concentration Areas						
Waterfowl Stopover and Staging Areas (Aquatic) (WSSA D1)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Fence 	0	No	Identified	Treated as Significant [‡]	✓
Waterfowl Stopover and Staging Areas (Aquatic) (WSSA D2)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0	No	Identified	Treated as Significant [‡]	✓
Waterfowl Stopover and Staging Areas (Aquatic) (WSSA D3)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0	No	Identified	Treated as Significant [‡]	✓
Raptor Wintering Area (RWA D1/WR6*)	n/a	n/a	No	Identified	Not Significant	---
Bat Maternity Colonies (BMC D1)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters 	0	No	Identified	Treated as Significant [‡]	✓

Sol-luce Kingston Solar PV Energy Project
NHA Addendum
Environmental Impact Study

Natural Feature	Applicable Project Component(s)	Distance Between Natural Feature and Project Location (metres)	Summary of Natural Heritage Assessment			EIS Required?
			Identified During Records Review?	Identified, Verified or Refined During Site Investigation?	Evaluation of Significance Results	
	<ul style="list-style-type: none"> ▪ Access Roads ▪ Fence 					
Reptile Hibernaculum (SH D1)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0	No	Identified	Treated as Significant [‡]	✓
Reptile Hibernaculum (SH D2)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0	No	Identified	Treated as Significant [‡]	✓
Rare Vegetation Communities						
None identified within the project location or adjacent lands within 120 metres						
Specialised Wildlife Habitat						
Waterfowl Nesting Area (WNA D1)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0	No	Identified	Treated as Significant [‡]	✓
Waterfowl Nesting Area (WNA D2)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0	No	Identified	Treated as Significant [‡]	✓
Woodland Raptor Nesting Habitat (RN1*)	n/a	n/a	No	Identified	Not Significant	---

Sol-luce Kingston Solar PV Energy Project
NHA Addendum
Environmental Impact Study

Natural Feature	Applicable Project Component(s)	Distance Between Natural Feature and Project Location (metres)	Summary of Natural Heritage Assessment			EIS Required?
			Identified During Records Review?	Identified, Verified or Refined During Site Investigation?	Evaluation of Significance Results	
Amphibian Breeding Habitat (Woodland) (ABF D1)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0	No	Identified	Treated as Significant [‡]	✓
<i>Habitat of Species of Conservation Concern</i>						
Marsh Breeding Bird Habitat (MBB D2)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0	No	Identified	Treated as Significant [‡]	✓
Open Country Breeding Bird Habitat (OCBB D1/9*)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0	No	Identified	Significant	✓
Shrub/Successional Breeding Bird Habitat (SBB 4*)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0	No	Identified	Significant	✓
Habitat for Giant Swallowtail (GS2*)	n/a	n/a	No	Identified	Not Significant	---
Habitat for Common Nighthawk (CN D1)	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Access Roads ▪ Fence 	0	No	Identified	Treated as Significant [‡]	✓
<i>Animal Movement Corridors</i>						
None identified within the project location or adjacent lands within 120 metres						

Sol-luce Kingston Solar PV Energy Project
NHA Addendum
Environmental Impact Study

Natural Feature	Applicable Project Component(s)	Distance Between Natural Feature and Project Location (metres)	Summary of Natural Heritage Assessment			EIS Required?
			Identified During Records Review?	Identified, Verified or Refined During Site Investigation?	Evaluation of Significance Results	
<i>Generalized Candidate Significant Wildlife Habitat</i>						
Various habitats	> 30	Various	No	Identified	Generalized	✓

‡Wildlife habitat treated as significant will be treated as significant in the EIS and evaluated for significance pre-construction; *Indicates identification code from original NHA report.

5. Environmental Impact Study Purpose

By completing an EIS Addendum Report in accordance with procedures established by the MNR for a NHA EIS, Subsection (1) of Section 38 (*Ontario Regulation 359/09*) may permit project components to be constructed and installed within 120 meters of a significant or provincially significant natural feature. This report is consistent with Section 38 of *Ontario Regulation 359/09*, which details that an EIS (Addendum) Report must include the following:

- Identification and assessment of any negative environmental effects of the project on a natural feature, provincial park or conservation reserve;
- Identification of mitigation measures in respect of any negative environmental effects;
- Description of how the environmental effects monitoring plan in the Design and Operations Report addresses any negative environmental effects; and,
- Description of how the construction plan report addresses any negative environmental effects.

The focus of this NHA EIS Addendum Report will be to fulfill the requirements of Section 38 for the significant/provincially significant natural features identified in **Table 1** as being within the project location or surrounding 120 m.

6. Rationale for Development Within a Natural Feature or Setback

The amended project location for the Sol-luce Kingston Solar PV Energy Project has been subject to numerous field investigations and a thorough review of constraints to development was undertaken prior to delineating the amended project location. Based on the natural environment information collected, the project location was refined to avoid impacts to significant and/or sensitive natural heritage features, where possible, and to satisfy the setback requirements issued by the host municipalities. The layout of the solar project has been developed to minimize its footprint and prioritized the protection of natural features that provide habitat for sensitive species. The project has been developed to retain the significance of natural features identified and mitigates effects that may occur.

7. Description of Project Activities

The purpose of this NHA Addendum EIS Report was to include the amended project location into the overall NHA for the project. Details pertaining to the project construction, design and operations, and decommissioning, as described in the original NHA (Section 5.1, AMEC 2012) remain unchanged. For more information related to these details, please refer to the original AMEC (2012) NHA Report.

7.1 Operational Flexibility

As part of this REA Amendment, Kingston Solar LP is requesting to pre-approve changes that may be made to the Sol-luce Kingston Solar PV Energy Project at the time of detailed design. These changes include, but are not limited to general modifications to the site plan that result in a decrease in the project location size. Adjustments to the inverter units, substation, panel layout, racking design, access roads, laydown area(s) and the communication tower may occur. In all cases where an operational or technical change is necessary, the project will remain within the bounds of the approved project location boundary and commitments made in the various technical reports and applicable addenda adhered to. During operations, routine modifications to the facility may be implemented (e.g., repaving of entrance, repairs to fencing, etc.) provided their effects are environmentally insignificant and do not exceed the boundaries of the project location.

For further details regarding operational flexibility for the Sol-luce Kingston Solar PV Energy Project, please refer to the REA Modifications Document.

8. Existing Environmental Conditions of Relevant Natural Features

Existing environmental conditions for the amended project location and surrounding areas was determined through the records review addendum and site investigation addendum, which comply with Section 25 and 26 of the *REA* process. Below, we provide a summary of the natural environment associated with the project location with specific focus on natural features of significance that require inclusion in this EIS addendum. The function, composition, attributes and characteristics that make natural features significant, contribute to their persistence, may be sensitive to development and serve as a good indicator of negative environmental effects are described below.

8.1 Overview

Through the records review and site investigation work, it was confirmed that the following natural features did not occur in the project location or relevant adjacent lands, or were not required to be evaluated for their significance:

- Provincial Parks and Conservation Reserves;
- ANSI, Earth Science;
- ANSI, Life Science; and,
- Valleylands.

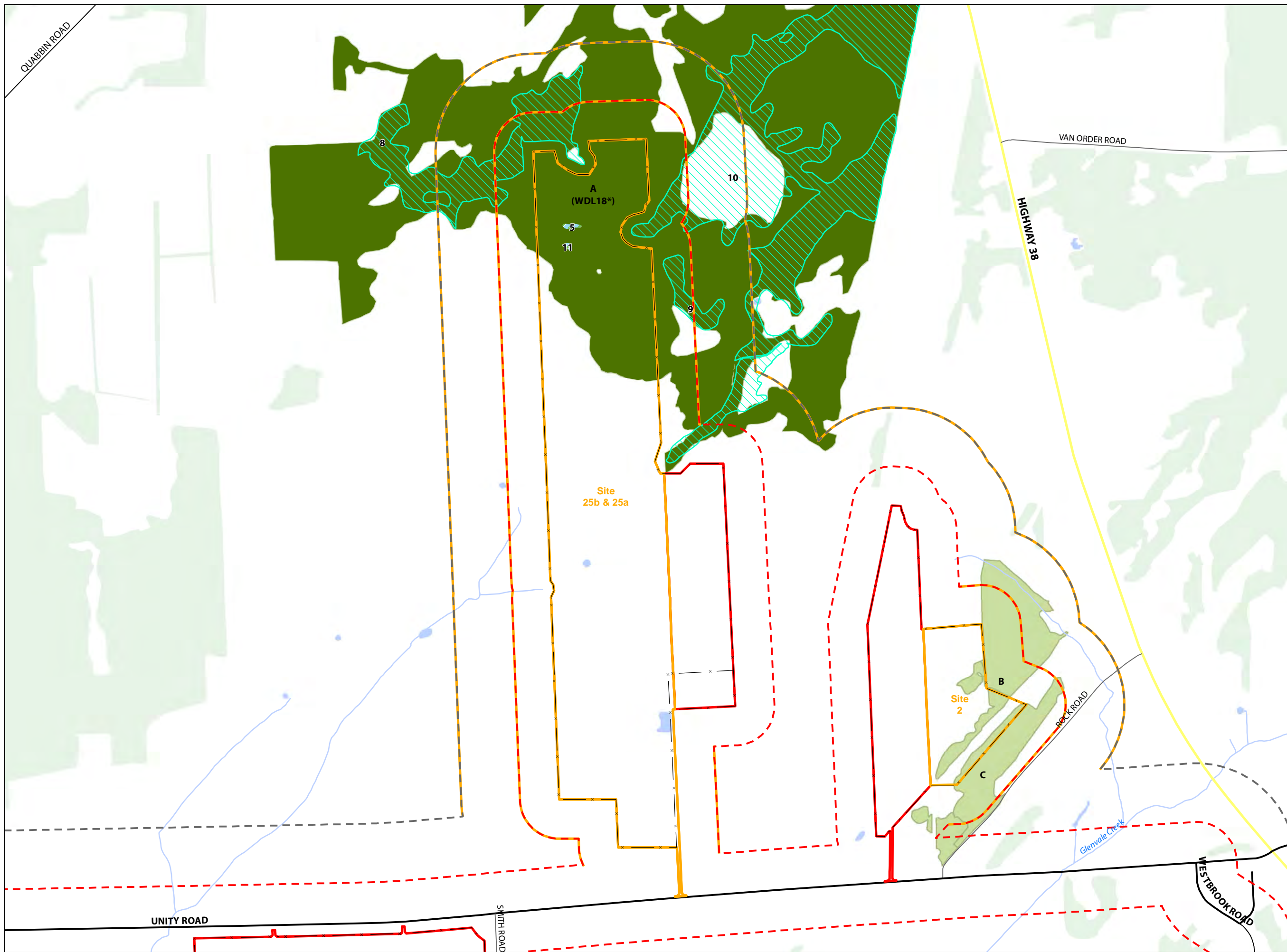
8.2 Description of Natural Features

8.2.1 Wetlands

The boundaries of southern wetland units in or within 120 m of the amended project location were delineated using the OWES protocol during the site investigation work and are shown on **Figure 3**. **Table 2** outlines the attributes, composition and function of each assumed significant wetland unit identified during the site investigation to be within 120 m of the amended project location and confirms if the wetland was included in the records review or was identified as a result of these site investigations. **Table 2** also outlines the project components that fall within 120 m of each assumed provincially significant wetland boundary. Characteristics that contribute to wetland persistence, may be sensitive to development and serve as a good indicator of negative environmental effects are described below in **Section 9**.

Sol-luce Kingston Solar PV Energy Project

Figure 3
Significant Wetlands and Woodlands



Legend

- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Potential Stream
- x-x Fence Line
- Project Location
- Amended Project Location
- 120 m Project Location Setback
- 300 m Project Location Setback
- 120 m Amended Project Location Setback
- 300 m Amended Project Location Setback
- Assumed Provincially Significant Wetland
- 5 Dillon Delineated Wetland (Non-provincially Significant)
- Significant Woodland
- Delineated Non-significant Woodland
- Unevaluated Woodland
- Dug Farm Pond

*Identifiers in parentheses refer to the original AMEC prepared NHA reports (June 2012)

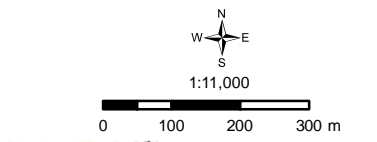


Table 2: Significant Southern Wetlands within the Amended Project Location and Surrounding 120 m

Wetland ID	Field Visit	Actual Wetland Size (hectares)	Wetland Type	Site Type	Vegetation Communities	Proximity to Other Wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement	Shoreline Erosion Control	Groundwater Recharge	Species Rarity	Significant Features and Habitats	Fish Habitat	Project Components within 120m	Nearest Distance from project location
										Details	Details	Details	Details	Details	Details		
8	Yes	9.79	Palustrine	Swamp, Marsh	<ul style="list-style-type: none"> 0.16 ha of Reed Canary Grass Bedrock Meadow Marsh (MAM1-1) 3.23 ha of Poplar Conifer Mineral Mixed Swamp (SWM3-2) 0.06 ha Poplar Mineral Deciduous Swamp (SWD4-5) 	183 m to Wetland 5 (Note: wetland 5 not complexed due to size of <0.5 ha)	Wetland unit provides moderate contribution to overall interspersion/biodiversity	None	Wetland unit provides moderate flood attenuation function with respect to entire upland catchment area	Catchment area determined to be >50% forested or other natural vegetation, water quality function will be unaltered	Wetland entirely Palustrine, no shoreline is present	Wetland entirely Palustrine; Wetland unit recharge potential will be unaltered	Western Chorus Frog was heard calling in this wetland unit. This species has no status under Ontario ESA but is Federally listed as Threatened	Habitat surrounding wetland potentially suitable for waterfowl nesting	None	<ul style="list-style-type: none"> Solar Panels Inverters Access Roads Fence 	54 m
9	No	1.39	Palustrine	Swamp	<ul style="list-style-type: none"> No access granted; aerial imagery suggests Mixed Swamp with Marsh or Meadow Marsh communities. 	64 m to Wetland 10	Wetland unit provides moderate contribution to overall interspersion/biodiversity	None	Wetland unit provides moderate flood attenuation function with respect to entire upland catchment area	Catchment area determined to be >50% forested or other natural vegetation, water quality function will be unaltered	Wetland entirely Palustrine, no shoreline is present	Wetland entirely Palustrine; Wetland unit recharge potential will be unaltered	No access	Habitat surrounding wetland potentially suitable for waterfowl nesting	Dominant vegetation forms not determined	<ul style="list-style-type: none"> Solar Panels Inverters Access Roads Fence 	33 m

Wetland ID	Field Visit	Actual Wetland Size (hectares)	Wetland Type	Site Type	Vegetation Communities	Proximity to Other Wetlands	Interspersion	Open Water Types	Flood Attenuation	Water Quality Improvement	Shoreline Erosion Control	Groundwater Recharge	Species Rarity	Significant Features and Habitats	Fish Habitat	Project Components within 120m	Nearest Distance from project location
										Details	Details	Details	Details	Details	Details		
10	Yes	32.3	Palustrine	Swamp, Marsh	<ul style="list-style-type: none"> • 0.35 ha Black Ash Mineral Deciduous Swamp (SWD2-1) • 2.81 ha of Green Ash Mineral Deciduous Swamp Type (SWD2-2) • 7.92 ha Open Bog (BOO1) 	64 m to Wetland 9	Wetland unit provides major contribution to overall interspersion/Biodiversity	Type 2	Wetland unit provides major flood attenuation function with respect to entire upland catchment area	Catchment area determined to be >50% forested or other natural vegetation, water quality function will be unaltered	Wetland entirely Palustrine, no shoreline is present	Wetland entirely Palustrine; Wetland unit recharge potential will be unaltered	No rare species observed in this wetland unit	Habitat potentially suitable for waterfowl nesting Colonial bird nesting known to occur, heron colony present	Low and high marsh present but dominant vegetation forms not determined	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	33 m

* Indicates identifier used in original AMEC prepared NHA reports.

8.2.2 Woodlands

The boundaries of woodland units in or within 120 m of the amended project location were delineated using ELC protocol during the site investigation work and shown on **Figure 3**. **Table 3** outlines the attributes, composition and function of each significant woodland unit identified during the site investigation to be within 120 m of the amended project location and confirms if the woodland was included in the records review or was identified as a result of these site investigations. **Table 3** also outlines the project components that fall within each significant woodland boundary and/or within 120 m. Characteristics that contribute to woodland persistence, may be sensitive to development and serve as a good indicator of negative environmental effects are described below in **Section 9**.

Table 3: Evaluation of Woodlands within the Amended Project Location and Surrounding 120 m

Woodland ID	Size Criterion	Ecological Functions Criteria					Woodland Uncommon Characteristics	Project Components within 120 m	Evaluation of Significance	
	Woodland Size (hectares)	Woodland Interior	Proximity to Other Significant Woodland or Habitats	Linkages	Water Protection	Woodland Diversity Representation			Significant	Not-Significant
	Size Threshold for Significance (hectares)									
	50	8	10	10	4	10			4	
A(18*)	175.57	32.08	Contains Generalized Candidate Significant Wildlife. Contains Candidate Significant Wildlife Habitat (Snake Hibernaculum, Amphibian Breeding Habitat (Woodland), Bat Maternal Colony, Waterfowl Stopover and Staging Area, Waterfowl Nesting Area)	May provide linkage function to Odessa Lake in the west and a large woodland to the east.	Contains Wetlands	This feature is a mixture of woodland (mixed and coniferous) ecosites with mixed swamp. The coniferous woodland is consistent with a FOC2-2 forest type. Eastern White Cedar shares dominance with White Spruce in the canopy, while Eastern White Cedar dominates the sub-canopy and understory with White Spruce as an associate. The mixed forest is comprised of White Pine and oak. The swamp ecosite is dominated by Green Ash, with sparse willow species in the understory; bulrush and sedges comprise the ground layer.	Large Open Bog with stick nests is contained within forest. Numerous fissures/holes in bedrock found.	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	✓	---

* Indicates identifier used in original AMEC prepared NHA reports.

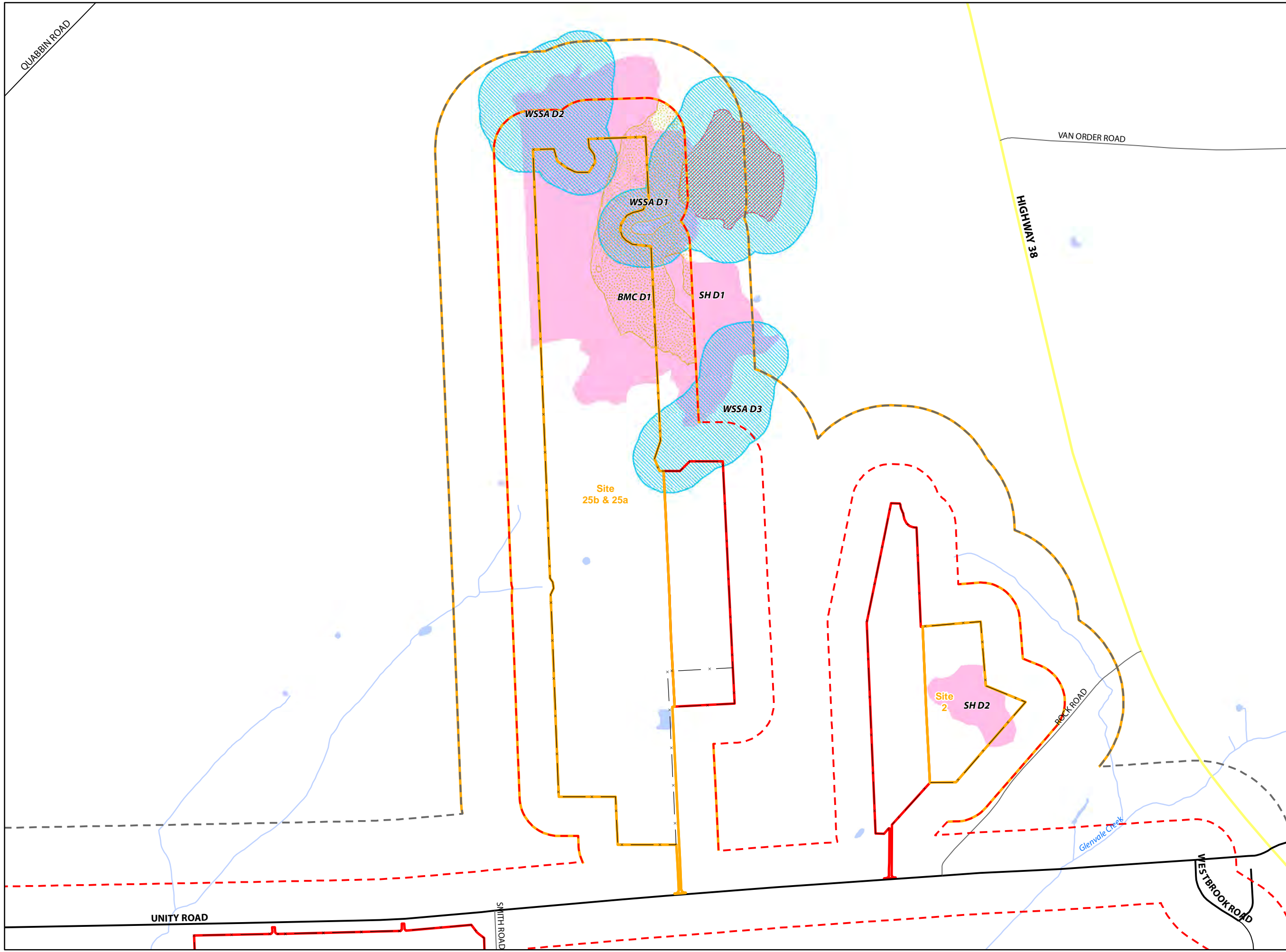
8.2.3 Wildlife Habitat

The occurrence and boundaries of significant wildlife habitat in or within 120 m of the amended project location were delineated using information collected during the site investigation (e.g. ELC, observation of suitable site characteristics, etc.) and following criteria outlined in the Significant Wildlife Habitat Technical Guide (MNR 2000) and Ecoregion 6E Criteria Schedule (MNR 2012). Wildlife habitats requiring inclusion in this NHA EIS Addendum are shown in **Figure 4-6**. **Table 4** outlines the attributes, composition and function of each identified significant/to be treated as significant wildlife habitat and the distance of project components that fall within 120 m of each wetland boundary. Characteristics that contribute to wildlife habitat persistence, may be sensitive to development and serve as a good indicator of negative environmental effects are described below in **Section 9**. For “Generalized Candidate Significant Wildlife Habitat” outlined in the *NHA Site Investigation Addendum Report*, general mitigation measures proposed in **Table 6** will address effects due to construction activities only.

QUABBIN ROAD

Sol-luce Kingston Solar PV Energy Project

Figure 4 Significant Wildlife Habitat Seasonal Concentration Areas



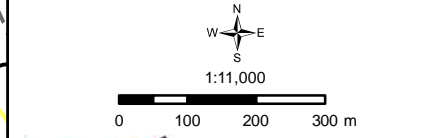
Legend

- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Potential Stream
- Fence Line
- Project Location
- Amended Project Location
- 120 m Project Location Setback
- 300 m Project Location Setback
- 120 m Amended Project Location Setback
- 300 m Amended Project Location Setback
- Dug Farm Pond

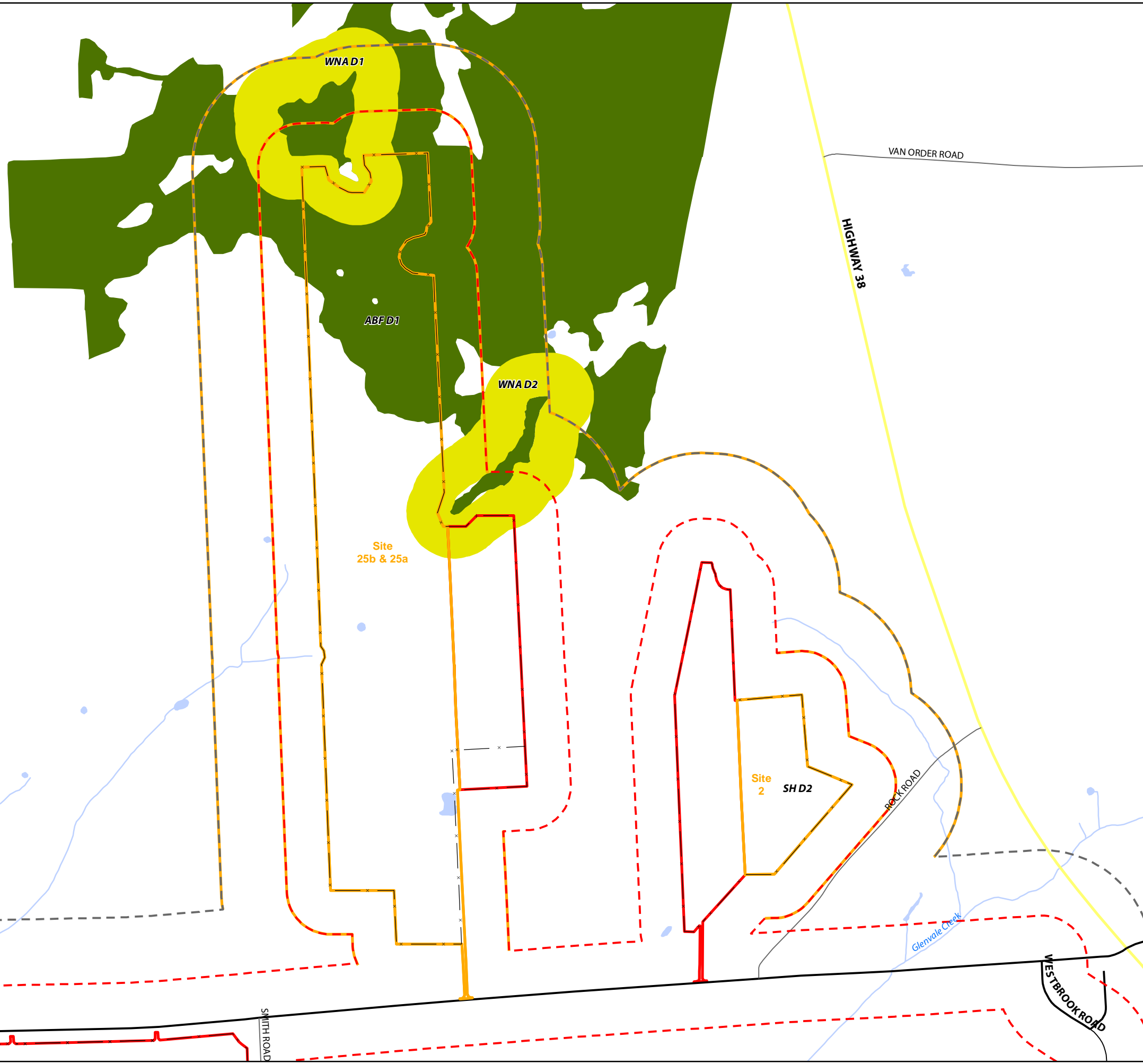
Seasonal Concentration Areas

- Bat Maternity Colony (BMC)
- Waterfowl Stopover and Staging Area (Aquatic) (WSSA)
- Reptile Hibernaculum (SH)
- Generalized Candidate Significant Wildlife Habitat

*Identifiers in parentheses refer to the original AMEC prepared NHA reports (June 2012)



QUABBIN ROAD



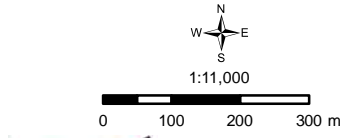
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**Figure 5
Significant Wildlife Habitat -
Specialised Wildlife Habitat**

Legend

- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Potential Stream
- Fence Line
- Project Location
- Amended Project Location
- 120 m Project Location Setback
- 300 m Project Location Setback
- 120 m Amended Project Location Setback
- 300 m Amended Project Location Setback
- Dug Farm Pond
- Specialised Wildlife Habitat**
- Waterfowl Nesting Area (WNA)
- Amphibian Breeding Habitat (Woodland) (ABF)

*Identifiers in parentheses refer to the original AMEC prepared NHA reports (June 2012)



QUABBIN ROAD

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Figure 6 Significant Wildlife Habitat - Habitat of Species of Conservation Concern

Legend

- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Potential Stream
- Fence Line
- Project Location
- Amended Project Location
- 120 m Project Location Setback
- 300 m Project Location Setback
- 120 m Amended Project Location Setback
- 300 m Amended Project Location Setback
- Dug Farm Pond

Species of Conservation Concern

- Marsh Breeding Bird Habitat (MBB D2)
- Habitat for Common Nighthawk (CN)
- Open Country Bird Breeding Habitat (OCBB)
- Shrub/Early Successional Bird Breeding Habitat (SSB)*

*Treated as Significant
 Generalized Candidate Significant Wildlife Habitat

Identifiers in parentheses refer to the original AMEC prepared NHA reports (June 2012)

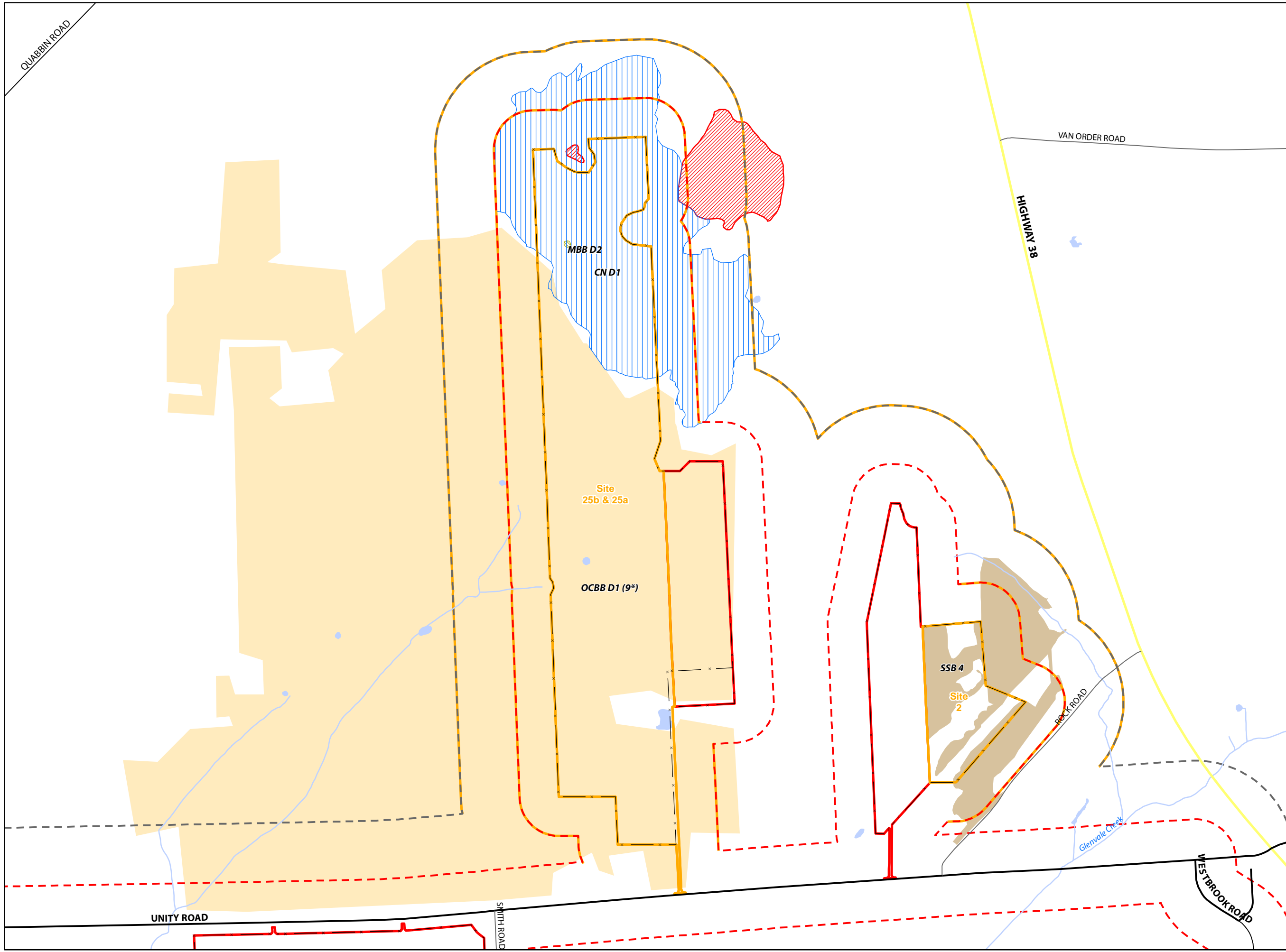
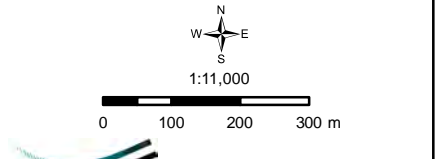


Table 4: Evaluation of Significant Wildlife Habitat in the Amended Project Location and Surrounding 120 metres

Wildlife Habitat	Attributes of Habitat**	Composition	Function	Relevant Evaluation Criteria Determining Status	Within Project Location	Within 120 m	Significant	Treated as Significant	Not Significant	Project Components within 120 m	Nearest Distance to project location
SEASONAL CONCENTRATION AREAS											
Waterfowl Stopover and Staging Areas (Aquatic) WSSA D1	Ponds, marshes, lakes, bays, coastal inlets and watercourses used during migration can be significant wildlife habitat for local and migrant waterfowl populations during migration. Sewage treatment ponds and storm water ponds do not qualify as a significant wildlife habitat; however, a reservoir managed as a large wetland or pond/lake does qualify. These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). Can be found in the following community types: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Deciduous Swamp (SWD).	Potential habitat exists in a 7.92 ha Open Bog (B001) and within the 100 m buffer that includes woodland habitat and a small swamp feature. The total size is 26.22 ha.	Spring/Breeding Habitat	Surveys to be conducted prior to construction	✓	✓	---	✓	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Fence 	0
Waterfowl Stopover and Staging Areas (Aquatic) WSSA D2		Potential habitat exists in 9.79 ha area consisting of Poplar Conifer Mineral Mixed Swamp (SWM3-2), Poplar Mineral Deciduous Swamp (SWD4-5), and Reed Canary Grass Bedrock Meadow Marsh (MAM1-1). The potential habitat also includes a 100 m buffer that includes the surrounding woodland habitat. Total size is 15.94 ha.	Spring/Breeding Habitat	Surveys to be conducted prior to construction	✓	✓	---	✓	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads 7 Fence 	0
Waterfowl Stopover and Staging Areas (Aquatic) WSSA D3		Potential habitat exists in a 1.65 ha Green Ash Mineral Deciduous Swamp (SWD2-1) plus a 100m buffer that includes the surrounding woodland and meadows. Total size is 14.13 ha.	Spring/Breeding Habitat	Surveys to be conducted prior to construction	✓	✓	---	✓	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 8 	0
Bat Maternity Colonies BMC D1	Maternity colonies can be found in tree cavities, vegetation and often in buildings; however, buildings are not considered significant wildlife habitat. Maternity roosts are not found in caves and mines in Ontario. This habitat is associated with any of the following Community Types: Deciduous Forest (FOD), Mixed Forest (FOM), that have ≥10/ha wildlife trees ≥25 cm diameter at breast height (dbh). Female bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1	Potential habitat exists in a 17.18 ha Dry-Fresh White Cedar-Hardwood Mixed Forest Type (FOM4-3).	Breeding Habitat	Surveys to be conducted prior to construction.	✓	✓	---	✓	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads 9 Fence 	0

Wildlife Habitat	Attributes of Habitat**	Composition	Function	Relevant Evaluation Criteria Determining Status	Within Project Location	Within 120 m	Significant	Treated as Significant	Not Significant	Project Components within 120 m	Nearest Distance to project location
	or 2.										
Reptile Hibernaculum SH D1	Hibernation occurs in sites located below frost lines in burrows, rock crevices, broken and fissured rock, wetlands such as conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. Hibernacula can be found in any ecosite in central Ontario other than very wet ones. The following Community Types may be directly related to snake hibernacula: Talus (TA), Rock Barren (RB), Crevice (CCR), Cave (CCA), and Alvar (RBOA1, RBSA1, RBTA1).	A 53.38 ha area primarily consisting of Dry-Fresh White Cedar Coniferous Forest Type (FOC2-2) and Dry-Fresh White Cedar-Hardwood Mixed Forest Type (FOM4-3). The area also has 4.85 ha of Mineral Cultural Savanna (CUS2). Rock crevices of various sizes were observed throughout Sites 25a and 25b. (Habitat boundaries based on the location of observed rock crevices)	Winter Habitat	Surveys to be conducted prior to construction.	✓	✓	---	✓	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0
Reptile Hibernaculum SH D2	Species of Special Concern Eastern Milksnake	A 3.71 ha area consisting of 1.13 ha of Dry-Fresh Graminoid Meadow Ecosite (MEGM3), 0.86 ha of Mineral Cultural Savanna (CUS2), 0.61 ha of Red Cedar Cultural Woodland Type (CUW1-1) and small amounts of other woodland type areas. (Habitat boundaries based on the location of observed rock crevices).	Winter Habitat	Surveys to be conducted prior to construction.	✓	✓	---	✓	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0

SPECIALISED HABITAT FOR WILDLIFE

Wildlife Habitat	Attributes of Habitat**	Composition	Function	Relevant Evaluation Criteria Determining Status	Within Project Location	Within 120 m	Significant	Treated as Significant	Not Significant	Project Components within 120 m	Nearest Distance to project location
Waterfowl Nesting Area WNA D1	Upland habitats of any kind located adjacent to the following wetland Community Types: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Aquatic (SA), Bedrock Thicket (RBS), Mineral Thicket Swamp (SWT), or Mineral	Potential habitat exists in 9.79 ha area consisting of Poplar Conifer Mineral Mixed Swamp (SWM3-2), Poplar Mineral Deciduous Swamp (SWD4-5), and Reed Canary Grass Bedrock Meadow Marsh (MAM1-1). The potential habitat also includes a 120 m buffer that includes the surrounding woodland habitat. Total size is 15.67 ha.	Nesting Habitat	Surveys to be conducted prior to construction.	✓	✓	---	✓	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0
Waterfowl Nesting Area WNA D2	Deciduous Swamp (SWD). Habitat should be at least 120 m wide. Three types of delineation criteria are provided: 1. If the wetland is greater than 0.5 ha, the habitat extends 120 m from it. 2. If the wetland is greater than 0.5 ha and includes any small wetlands 0.5 ha within 120 m, the area 120 m from this is candidate habitat. 3. A cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each other. The upland areas should be at least 120 metres wide. Wood ducks and hooded mergansers utilize large diameter trees (>40 cm dbh) in woodlands for cavity nest sites.	Potential habitat exists in a 1.65 ha Green Ash Mineral Deciduous Swamp (SWD2-1) plus a 120 m buffer that includes the surrounding woodland and meadows. Total size is 15.71 ha.	Nesting Habitat	Surveys to be conducted prior to construction.	✓	✓	---	✓	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0
Amphibian Breeding Habitat (Woodland) ABF D1	The presence of a wetland, lake or pond within or adjacent to (within 120 m) a woodland that contains permanent ponds or contains water in most years until mid-July are most likely to be used as breeding habitat.	A 183.39 ha woodland area consisting of Dry-Fresh White Cedar Coniferous Forest Type (FOC2-2), Dry-Fresh White Cedar-Hardwood Mixed Forest Type (FOM4-3), Coniferous Swamp (SWC), Mineral Meadow Marsh (MAM2), Black Ash Mineral Deciduous Swamp (SWD2-1), Reed Canary Grass Bedrock Meadow Marsh (MAM1-1), Poplar Conifer Mineral Mixed Swamp (SWM3-2), Poplar Mineral Deciduous Swamp (SWD4-5) and Open Bog (BOO1).	Breeding Habitat	Surveys to be conducted within and/or adjacent to wetland areas found in the habitat prior to construction.	✓	✓	---	✓	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0
HABITAT OF SPECIES OF CONSERVATION CONCERN											
Marsh Breeding Bird Habitat	This habitat includes all wetlands as long as there is shallow water with emergent	Potential habitat exists in 0.03 ha Mineral meadow marsh (MAM2) community on Site 25.	Breeding Habitat	Surveys to be conducted prior to construction	✓	---	---	✓	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters 	0

Wildlife Habitat	Attributes of Habitat**	Composition	Function	Relevant Evaluation Criteria Determining Status	Within Project Location	Within 120 m	Significant	Treated as Significant	Not Significant	Project Components within 120 m	Nearest Distance to project location
MBB D2	<p>aquatic vegetation present. For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently it may be found in upland shrubs or forest a considerable distance from water. The following ELC communities should be considered: Meadow Marsh (MAM), Shallow Aquatic (SA), Open Bog (BOO), Open Fen (FEO), or for Green Heron: SW (Swamp), MA (Marsh) and Meadow (ME).</p> <p>Species of Conservation Concern: Black Tern</p>									<ul style="list-style-type: none"> ▪ Access Roads ▪ Fence 	
Open Country Bird Breeding Habitat OCBB D1/9*	<p>Large grassland areas (including natural and cultural fields and meadows) are important to support grassland breeding bird species. Grassland areas > 30 ha, and do not include Class 1 or Class 2 agricultural lands. Habitat does not include fields with row-cropping or intensive hay or livestock pasturing in the last 5 years. This habitat can be found in Meadows (ME).</p> <p>Species of Conservation Concern: Short-eared Owl</p>	<p>A large (291.5 ha) open country habitat consisting of active pasture, used agricultural lands. This habitat extends well north of Unity Road and away from rural building and regular human activity. The area consists of 110.47 ha of Dry-Moist Old Field Meadow Type (CUM1-1), 39.73 ha of Perennial Cover Crop, 17.04 ha of Open Pasture, 12.54 ha of Rural Property, 5.82 ha of Annual Row Crop, and 3.86 ha of Mineral Cultural Savanna.</p>	Breeding Habitat	Habitat determined to be significant in Table 4-7 of the original NHA (AMEC 2012)	✓	✓	✓	---	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0
Shrub/Early Successional Bird Breeding Habitat SSB 4*	<p>Oldfield areas succeeding to shrub and thicket habitats >10 ha, that are not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years. This habitat can be found in Thickets (TH) and Savannas (SV).</p>	<p>This feature is 16.39 ha in size and consists of Mineral Cultural Savannah (CUS1), Gray Dogwood Cultural Thicket Type (CUT1-4), Cultural Woodland (CUW), and Red Cedar Cultural Woodland Type (CUW1-1).</p> <p>Note this habitat boundary was revised from the original AMEC mapped SSB 4* (AMEC 2012 Appendix A Figure 3-7 and Appendix B 3-8).</p>	Breeding Habitat	<p>Habitat determined to be significant in Table 4-13 of the original NHA (AMEC 2012)</p> <p>Points BB100 and BB102 were used (see Appendix A, Figure 4-4f). Brown Thrasher, Eastern Towhee, and Field Sparrow were observed during breeding bird surveys.</p>	✓	✓	✓	---	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Inverters ▪ Access Roads ▪ Fence 	0

Wildlife Habitat	Attributes of Habitat**	Composition	Function	Relevant Evaluation Criteria Determining Status	Within Project Location	Within 120 m	Significant	Treated as Significant	Not Significant	Project Components within 120 m	Nearest Distance to project location
Common Nighthawk CN D1	Traditional Common Nighthawk habitat consist of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings. Although the species also nests in cultivated fields, orchards, urban parks, mine tailings, and along gravel roads and railways, they tend to occupy natural sites.	A 51.25 ha unit. ELC was conducted within 29.24 ha of this unit consisting of 11.49 ha of Dry-Fresh White Cedar Coniferous Forest Type (FOC2-2) and 9.04 ha of Dry-Fresh White Cedar-Hardwood Mixed Forest Type (FO 4-3), 3 ha of Dry White Cedar Calcareous Bedrock Coniferous Forest Type (FOC2-2).	Nesting and Foraging Habitat	Surveys to be conducted prior to construction	✓	✓	---	✓	---	<ul style="list-style-type: none"> ▪ Solar Panels ▪ Access Roads ▪ Fence 	0

*indicates identifier used in original NHA reports; **Based on Significant Wildlife Habitat Technical Guide, MNR 2000; Natural Heritage Assessment Guide for Renewable Energy Projects, MNR 2012a; Ecoregion 6Criteria schedule MNR 2012b

9. Environmental Effects of the Project

A summary of attributes, composition and function defined in **Tables 2, 3, and 4** that contribute to the persistence of provincially significant and/or significant natural features, may be sensitive to development and serve as good indicators of negative environmental effects are described below in **Table 5**. This summary provides key components of natural feature attributes, composition and function which will be brought forward and evaluated as part of the impact analysis.

The evaluation of potential impacts, mitigation and residual effects are discussed in **Table 6**. In many cases, activities listed in **Table 6** overlap (e.g., clearing and equipment lay-down). Where activities overlap, the first activity in the project construction sequence or which has the broadest impact is evaluated in **Table 6**. Please note that the mitigation measures made in **Table 6** are consistent with the measures outlined in the original NHA (AMEC 2012). In general, the mitigation measures have been designed to reduce the impacts of construction, operations, and decommissioning to the significant natural features and include measures such as implementing an erosion and sediment control plan, reducing impacts on local wildlife through noise abatement, fencing, and occurrence reporting, and restoration.

Table 5: A Summary of Natural Feature Key Features & Function and Other Characteristics that are Sensitive to Development and May Serve as Good Indicators of Negative Environmental Effects

Natural Feature	Indicator Species Group(s)	Features/Attributes Necessary for Persistence (Physical and Functional)	Features Potentially Sensitive to Development	Good Indicator Features/Species
Wetlands				
8, 9, and 10	Amphibians, Wetland breeding birds, Native wetland flora	Physical: adjacent wetlands, overland flow, localized water retention, water quality, vegetation, vegetation cover Functional: connection with other natural features, species richness, wildlife habitat diversity	Water quality (wetlands and riverine), vegetation along the edge of feature, species richness, wildlife habitat diversity	<ul style="list-style-type: none"> Vegetation along the edge of feature acting as a natural buffer between the wetland and the project location Species richness (amphibians, colonial nesting birds, marsh breeding birds, waterfowl)
Woodlands				
A (18*)	Native woodland flora	Physical: occurrence of large contiguous forest unit with low disturbance Functional: provides interior habitat, is adjacent to other significant wildlife habitat, provides habitat for woodland species	Vegetation along the edge of the feature, interior habitat, woodland species richness	<ul style="list-style-type: none"> Vegetation along the edge of feature Persistence/dominance of native tree species
Seasonal Concentration Areas				
Waterfowl Stopover and Staging Areas	Canada Goose Cackling Goose Snow Goose	Physical: occurrence of large flooded areas in association with wetlands during the spring melt and run-off.	Food supply and volume of water.	<ul style="list-style-type: none"> Species abundance and richness Annual use of habitat

Sol-luce Kingston Solar PV Energy Project
NHA Addendum
Environmental Impact Study

Natural Feature	Indicator Species Group(s)	Features/Attributes Necessary for Persistence (Physical and Functional)	Features Potentially Sensitive to Development	Good Indicator Features/Species
(Aquatic) (WSSA D1 [†] , D2 [†] , D3 [†])	American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked Duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	Functional: provides areas for large aggregations of waterfowl stopover and staging.		
Bat Maternity Colonies (BMC D1 [†])	Big Brown Bat Silver-haired Bat	Physical: occurrence of tree cavities and snags in large deciduous trees. Functional: roosting and protection from predators.	Presences of large deciduous trees with snags/cavities used for maternity colonies.	<ul style="list-style-type: none"> • Species abundance and richness • Occurrence of many snag and cavities.
Reptile	Eastern Milksnake	Physical: occurrence of natural structures	Hibernacula	<ul style="list-style-type: none"> • Species abundance and

Sol-luce Kingston Solar PV Energy Project
NHA Addendum
Environmental Impact Study

Natural Feature	Indicator Species Group(s)	Features/Attributes Necessary for Persistence (Physical and Functional)	Features Potentially Sensitive to Development	Good Indicator Features/Species
Hibernaculum (SH D1 [‡] , SH D2 [‡])	Eastern Gartersnake Northern Watersnake	that are below the frost line Functional: overwintering habitat		richness
Specialised Habitat for Wildlife				
Waterfowl Nesting Areas (WFA D1 [‡] and D2 [‡])	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	Physical: Wide continuous upland area near wetlands > 0.5 ha. Presences of large trees important for Wood Ducks and Hooded Mergansers. Functional: Protection of nests from predators such as raccoons, skunks, and foxes; and, cavities for nest sites.	Nesting habitat for waterfowl species (e.g., large trees and continuous upland area)	<ul style="list-style-type: none"> • Species abundance and richness • American Black Duck
Amphibian Breeding Habitat (Woodland) (ABF D1 [‡])	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	Physical: occurrence of wetland community with seasonally-inundated open water area(s) Functional: water quality to support breeding; connection to upland habitat	Breeding habitat for amphibians (e.g., wetlands, fringes of open water areas), water quality of breeding ponds	<ul style="list-style-type: none"> • Water quality of breeding ponds within 30 m of project components • Amphibian species richness and abundance • Occurrence of quality wetland vegetation cover • Western Chorus Frog (in habitat where species was previously observed in pre-

Sol-luce Kingston Solar PV Energy Project
NHA Addendum
Environmental Impact Study

Natural Feature	Indicator Species Group(s)	Features/Attributes Necessary for Persistence (Physical and Functional)	Features Potentially Sensitive to Development	Good Indicator Features/Species
				construction surveys)
Habitat of Species of Conservation Concern				
Marsh Breeding Bird Habitat (MBB D2 [†])	American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Black Tern Yellow Rail	Physical: Wetlands with shallow water and emergent aquatic vegetation. Functional: areas for nesting and protection from predators.	Nesting habitat for area-sensitive marsh breeding birds (e.g., volume of water and presences of aquatic vegetation).	<ul style="list-style-type: none"> Species Richness and Abundance Black Terns, Trumpeter Swan, Green Heron, or Yellow Rail.
Open Country Breeding Bird Habitat (OCBB D1/9*)	American Kestrel Barn Owl Eastern Kingbird Grasshopper Sparrow Northern Harrier Savannah Sparrow Short-eared Owl Upland Sandpiper Vesper Sparrow	Physical: occurrence of contiguous grassland habitat Functional: connection of grassland habitats to maintain species richness	Nesting habitat for area-sensitive open country breeding birds Grassland bird richness and abundance based on pre-construction values	<ul style="list-style-type: none"> Grassland bird richness and abundance based on pre-construction values Persistence of native grassland vegetation in natural vegetation communities
Shrub/Successional Breeding Bird	Brown Thrasher Clay-coloured sparrow	Physical: large fields of shrub land , shrub thicket, or early successional fields> 10	Nesting habitat for area-sensitive	<ul style="list-style-type: none"> Shrub/successional bird richness and

Natural Feature	Indicator Species Group(s)	Features/Attributes Necessary for Persistence (Physical and Functional)	Features Potentially Sensitive to Development	Good Indicator Features/Species
Habitat (SBB 4*)		ha in size Functional: connection of shrubland, shrub thicket or early successional habitats to maintain species richness	shrub/successional breeding birds. Shrub/Successional bird richness and abundance based on pre-construction values.	abundance based on pre-construction values <ul style="list-style-type: none"> • Persistence of native shrub/successional vegetation in natural vegetation communities
Common Nighthawk (CN D1 [‡])	Common Nighthawk	Physical: open woodlands with clear ground. Functional: areas for nesting and foraging.	Nesting habitat for Common Nighthawk	<ul style="list-style-type: none"> • Presences of Common Nighthawk

‡ denotes 'treated as' significant and pre-construction surveys will be completed to evaluate wildlife habitat; * Indicates identifier used in original AMEC prepared NHA reports.

Table 6: Summary of Potential Negative Effects and Mitigation Measures for Significant/Provincially Significant Natural Features

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
Wetlands within 120 metre setback area									
Wetland 8 Wetland 9 Wetland 10	Construction Activities- Vegetation Clearing	The perimeter fence is 54 m, 33 m, and 33 m from the edge of Wetland 8, 9, and Wetland 10, respectively. Other project components within 120 m include access roads, inverters, and solar panels.	<ul style="list-style-type: none"> None. No direct impacts as no vegetation clearing is to occur within 30 m of the wetland boundary. 	<ul style="list-style-type: none"> Decreased wetland quality 	Low. Wetlands only have the potential to be indirectly effected.	Once during construction.	Until vegetative cover of the project area is restored during the operations phase	<ul style="list-style-type: none"> Maintain a clearly demarcated boundary where no works occur within 30 m of a wetland boundary. The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. A protocol will be provided to contractors to follow in the event wildlife is encountered. Noise abatement devices will be utilized on construction and support equipment present on the site with objective of keeping the noise level within the acceptable construction noise standards and help maintain air quality. 	Due to the minimum 30 m separation distances between the Project Location and the natural features, and avoidance of direct effects, no net adverse effects are anticipated to wetlands.
Wetland 8 Wetland 9 Wetland 10	All phases- Use of vehicles and machinery during construction, operations, and decommissioning.	The perimeter fence is 54 m 33 m, and 33 m from the edge of Wetland 8, 9, and Wetland 10, respectively. Other project components within 120 m include access roads, inverters, and solar panels.	<ul style="list-style-type: none"> Emissions- Potential for air pollution from dust and emissions from construction vehicles and machinery and equipment. Overall impact to air quality during construction, operations, and decommissioning Leaks and Spills- Potential for leak or spill of fuel and other deleterious substances from vehicles and machinery that affect wetland wildlife, vegetation, or 	<ul style="list-style-type: none"> Reduction in air quality Reduction in water and soil quality 	<p>Low.</p> <p>Emissions- Slight change to temporary air quality</p> <p>Leaks and Spills- Minimal localized effect.</p>	Once during construction Minimal during operations Once during decommissioning	Short-term	<ul style="list-style-type: none"> All vehicles, machinery and equipment must be maintained and equipped with emission controls, as applicable by provincial standards. Construction work shall be carried out as according to Canadian Environmental Protection Act (CEPA), and applicable air emission regulations and by-laws. Implement best management practices (BMPs) and establish an emergency spill plan. Ensure that emergency spill kit is available at the Project Location at all times in the event that a spill occurs. All spills and leaks of deleterious substances must be immediately contained and cleaned up in accordance with Provincial regulatory requirements and reported 	Some emissions will be generated during project activities with no net adverse effect to significant natural features. Low potential for residual effects of leaks and spills if mitigation measures applied.

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
			contaminate water and the soil.					<p>immediately to the Ontario Spills Action Centre (1-800-268-6060).</p> <ul style="list-style-type: none"> ▪ Excess material will be removed from the site. ▪ No refuelling or maintenance of vehicles within 30 m of natural features. ▪ Maintain log book of any spills and mitigation measures. ▪ A crushed stone-tracking pad, or similar, will be installed at the site access to reduce tracking of sediment onto adjacent roadways during construction activities. Street sweeping and cleaning may be scheduled if necessary. 	
Wetland 8 Wetland 9 Wetland 10	Construction and Decommissioning – Storage and movement of materials	<p>The perimeter fence is 54 m, 33 m, and 33 m from the edge of Wetland 8, 9, and Wetland 10, respectively.</p> <p>Other project components within 120 m include access roads, inverters, and solar panels.</p>	<ul style="list-style-type: none"> ▪ Release of dust and soil particles into wetlands 	<ul style="list-style-type: none"> ▪ Sedimentation 	Low.	<p>Once during construction</p> <p>Once during decommissioning</p>	<p>Short-term increase of sedimentation until vegetation in the project location has been restored. Note, the wetlands have been afforded buffers of 54 m, 33 m, and 33 m, respectively.</p> <ul style="list-style-type: none"> ▪ Use controlled work procedures in order to eliminate release of dust from construction works. Mist can be applied to reduce dust releases (e.g., water mist or non-chloride based materials). ▪ Minimize activities with potential for dust releases especially during windy and prolonged dry periods. ▪ Stabilize areas of stockpiled or exposed soils. ▪ Materials that have potential of releasing dust or airborne particle must be covered during their transport, installation or removal e.g., by trapping, mulching, re-vegetating or watering in order to create a crusted surface. ▪ Minimize vehicle traffic adjacent to wetlands, or exposed soils. All traffic to use designated areas. ▪ Restore disturbed areas as soon as possible to minimize the duration of soil exposure. 	<p>Some fugitive dust during preparation from project activities will be generated.</p> <p>Site preparation activities will be temporary and short (months) duration. No effects from dust are anticipated in operations phase.</p> <p>No adverse effects on natural features are anticipated with implementation of mitigation measures.</p>	

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
Wetland 8 Wetland 9 Wetland 10	Construction and Decommissioning – Grading, digging, and trenching	The perimeter fence is 54 m, 33 m, and 33 m from the edge of Wetland 8, 9, and Wetland 10, respectively. Other project components within 120 m include access roads, inverters, and solar panels.	<ul style="list-style-type: none"> ▪ Soil erosion as a result of grading, digging, and trenching. Portions of the Project Location and stockpiled material being exposed to erosion processes, including wind and surface run-off. ▪ Short-term hydrological changes- Potential short-term changes to surface water hydrology and drainage to/from natural features. Potential increase in surface water runoff due to grading or ditching associated with access roads, soil compaction, and/or the removal of vegetation. 	<ul style="list-style-type: none"> ▪ Increased sedimentation in wetlands ▪ Altered water levels in wetlands 	Low due to 30 m buffer and implementation of mitigation measures	Once during construction Once during decommissioning	Short-term	<ul style="list-style-type: none"> ▪ Limits of construction work to be staked in the field in order to minimize disturbance to the wetland habitat and wildlife. Construction envelope to be clearly demarcated and kept as small as possible. ▪ Develop and implement an erosion and sediment control plan. The proposed preparation activities will be designed and implemented so as not to alter off-site drainage patterns and will not significantly alter the elevations throughout the Project Location. ▪ Internal project access roads to be constructed at or near grade and the use of impermeable materials avoided to promote groundwater recharge. ▪ The project does not require extensive dewatering. An erosion and sediment control plan will be in place to prevent stormwater runoff from entering open excavations (e.g., hay bales, sediment bags). ▪ Flow retention features may be used in ditches to mitigate increases in surface water run-off (e.g., straw bales or rock-fill flow checks). Soil stabilization along with seeding/planting as needed to stabilize soil upon completion of work activities to attenuate runoff 	Erosion effects are not anticipated during operations phase as Project Location will be rehabilitated to have permanent vegetation groundcover on all disturbed areas. There is low potential for residual effects during the construction phase if mitigation measures applied.
Woodlands									
Woodland A	Construction Activities- Vegetation Clearing	Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of	<ul style="list-style-type: none"> ▪ Disturbance to Habitat and Wildlife ▪ Loss of 19.54 ha of woodland area 	<ul style="list-style-type: none"> ▪ Removal of 11.04 ha of interior woodland area ▪ Loss of habitat for woodland 	Moderate. 19.54 ha to be removed from Woodland A. Woodland retains criteria for significance.	Once during construction	Permanent.	<ul style="list-style-type: none"> ▪ Limits of construction work to be staked in the field in order to minimize disturbance to the woodland habitat and wildlife. Construction envelope to be clearly demarcated and kept as small as possible. When woodland clearing is 	Removal of the woodland area represents a 11 % decrease in woodland area and a corresponding

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			Physical Impact (Direct)	Functional Effect (Indirect)					
		Woodland A.		species ▪ In cleared areas, loss of ecological function				taking place the area will be staked and monitored to ensure that no additional woodland is cleared during the clearing. ▪ If through detailed design it is determined that a reduction of the project footprint is possible, reasonable efforts will be undertaken to avoid Woodland A. This would be dependent on a variety of factors, including but not limited to input from the participating landowners. Re-vegetate cleared lands with native grass species. ▪ If determined to not impact effective stormwater management of the project, removed materials consisting of rocks, soil, and woody debris will be placed along the woodland edge to the north of the project location to create habitat for reptiles and small mammals. Materials should be placed in a linear fashion no more than two to five metres high. Pile will only consist of natural material. ▪ Avoid construction (including clearing) and decommissioning activities during the breeding season to minimize impacts on breeding birds and amphibians. Should clearing be required during the breeding bird season, nest searches conducted by a qualified person must be completed 48 hours in advance of clearing. If nest are found, then work can not occur within the timing window. If there are no nests, then clearing can occur. Construction may occur on cleared lands during the breeding season provided that no additional vegetation must be cleared.	34 % decrease in woodland interior. However, the woodland will remain significant post-clearing as all criteria (e.g., total size and area of interior forest, and wildlife habitat; see Table 5 of the <i>Evaluation of Significance Addendum</i> report) met to establish significance will remain unchanged.

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
								<ul style="list-style-type: none"> ▪ The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. A protocol will be provided to contractors to follow in the event wildlife is encountered. ▪ Noise abatement devices will be utilized on construction and support equipment present on the site with objective of keeping the noise level within the acceptable construction noise standards and help maintain air quality. 	
Woodland A	All phases- Use of vehicles and machinery during construction, operations, and decommissioning.	Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of Woodland A.	<ul style="list-style-type: none"> ▪ No direct effect on woodland area adjacent to project location following vegetation clearing of woodland within project location. 	<ul style="list-style-type: none"> ▪ Emissions- Potential for air pollution from dust and emissions from construction vehicles and machinery and equipment. Overall impact to air quality during construction, operations, and decommissioning ▪ Leaks and Spills- Potential for leak or spill of fuel and other deleterious substances from vehicles and machinery 	<p>Low.</p> <p>Emissions- Slight/temporary change to air quality</p> <p>Leaks and Spills- Minimal localized effect should effect occur</p>	Once during construction Minimal during operations Once during decommissioning	Short-term	<ul style="list-style-type: none"> ▪ All vehicles, machinery and equipment must be maintained and equipped with emission controls, as applicable by provincial standards. ▪ Construction work shall be carried out as according to Canadian Environmental Protection Act (CEPA), and applicable air emission regulations and by-laws. ▪ Implement best management practices (BMPs) and establish an emergency spill plan. ▪ Ensure that emergency spill kit is available at the Project Location at all times in the event that a spill occurs. All spills and leaks of deleterious substances must be immediately contained and cleaned up in accordance with Provincial regulatory requirements and reported immediately to the Ontario Spills Action Centre (1-800-268-6060). ▪ Excess material will be removed from the site. ▪ No refuelling or maintenance of vehicles within 30 m of natural features. ▪ Maintain log book of any spills and 	Some emissions will be generated during project activities with no net adverse effect to significant natural features. Low potential for residual effects of leaks and spills if mitigation measures applied.

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			Physical Impact (Direct)	Functional Effect (Indirect)					
				that affect wetland wildlife, vegetation, or contaminate water and the soil. <ul style="list-style-type: none"> ▪ Potential for dust ▪ Reduction in water and soil quality 				mitigation measures. <ul style="list-style-type: none"> ▪ A crushed stone-tracking pad, or similar, will be installed at the site access to reduce tracking of sediment onto adjacent roadways during construction activities. Street sweeping and cleaning may be scheduled if necessary. 	
Woodland A	Construction and Decommissioning – Storage and movement of materials	Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of Woodland A.	<ul style="list-style-type: none"> ▪ No direct effect on woodland area adjacent to project location following vegetation clearing of woodland within project location. 	<ul style="list-style-type: none"> ▪ Sedimentation ▪ Release of dust and soil particles into woodlands 	Low	Once during construction Once during decommissioning	Short-term increase of sedimentation until vegetative buffers have been restored	<ul style="list-style-type: none"> ▪ Use controlled work procedures in order to eliminate release of dust from construction works. Mist can be applied to reduce dust releases (e.g., water mist or non-chloride based materials) ▪ Minimize activities with potential for dust releases especially during windy and prolonged dry periods. ▪ Stabilize areas of stockpiled or exposed soils. ▪ Materials that have potential of releasing dust or airborne particle must be covered during their transport, installation or removal e.g., by trapping, mulching, re-vegetating or watering in order to create a crusted surface. ▪ Minimize vehicle traffic adjacent to wetlands, or exposed soils. All traffic to use designated areas. ▪ Restore disturbed areas as soon as possible to minimize the duration of soil exposure. 	Some fugitive dust during preparation from project activities will be generated. Site preparation activities will be temporary and short (months) duration. No effects from dust are anticipated in operations phase. No adverse effects on natural features are anticipated with implementation of mitigation measures.
Woodland A	Construction and Decommissioning- – Grading, digging, and trenching	Solar panels, inverters, access roads, and fence will all be constructed	<ul style="list-style-type: none"> ▪ No direct effect on woodland area adjacent to project location following 	<ul style="list-style-type: none"> ▪ Soil erosion as a result of grading, digging, and 	Low	Once during construction Once during	Short-term	<ul style="list-style-type: none"> ▪ Limits of construction work to be staked in the field in order to minimize disturbance to the woodland habitat and wildlife. Construction envelope to be 	Erosion effects are not anticipated during operations phase as Project

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			Physical Impact (Direct)	Functional Effect (Indirect)					
		within the area delineated as part of Woodland A.	vegetation clearing of woodland within project location.	trenching. Portions of the Project Location and stockpiled material being exposed to erosion processes, including wind and surface run-off. <ul style="list-style-type: none"> ▪ Short-term hydrological changes- Potential short-term changes to surface water hydrology and drainage to/from natural features. Potential increase in surface water runoff due to grading or ditching associated with access roads, soil compaction, and/or the removal of vegetation. 		decommissioning		clearly demarcated and kept as small as possible. <ul style="list-style-type: none"> ▪ Develop and implement an erosion and sediment control plan. The proposed preparation activities will be designed and implemented so as not to alter off-site drainage patterns and will not significantly alter the elevations throughout the Project Location. ▪ Internal project access roads to be constructed at or near grade and the use of impermeable materials avoided to promote groundwater recharge. ▪ The project does not require extensive dewatering. An erosion and sediment control plan will be in place to prevent stormwater runoff from entering open excavations (e.g., hay bales, sediment bags). ▪ Flow retention features may be used in ditches to mitigate increases in surface water run-off (e.g., straw bales or rock-fill flow checks). ▪ Soil stabilization along with seeding/planting as needed to stabilize soil upon completion of work activities to attenuate runoff. Seed mix will include fast growing native grass species. 	Location will be stabilized with permanent vegetation groundcover on all disturbed areas. There is low potential for residual effects during the construction phase if mitigation measures are applied.
Waterfowl Stopover and Staging Areas (Aquatic)									

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			Physical Impact (Direct)	Functional Effect (Indirect)					
<p>Waterfowl Stopover and Staging Areas (Aquatic) (WSSA D1[†]; WSSA D2*; WSSA D3*)</p> <p>Pre-construction surveys will be conducted at WSSA D1, WSSA D2, and WSSA D2 according to methodology presented in the NHA Evaluation of Significance Addendum Report. These surveys will take place in 2014.</p> <p>This habitat has been treated as significant until the evaluation can occur. Please note the mitigation measures outlined will only be undertaken if the habitat is evaluated to be significant after pre-construction surveys are complete.</p>	<p>Construction Activities- Vegetation Clearing and Grubbing</p>	<p>Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of WSSA D1, WSSA D2, and WSSA D3.</p>	<ul style="list-style-type: none"> ▪ Partial loss of buffer area surrounding wetland habitat ▪ Disturbance to species inhabiting the natural feature 	<ul style="list-style-type: none"> ▪ Declines in local waterfowl populations and species richness ▪ Avoidance of habitat 	<p>Low. Only the buffer habitat is directly impacted.</p>	<p>Once during construction</p>	<p>Construction phase during spring melt and run-off period</p>	<ul style="list-style-type: none"> ▪ Pre-construction surveys will be undertaken to confirm habitat use by waterfowl within the natural features. ▪ If through detailed design, a reduction of the project foot print will occur, project infrastructure will be removed from Woodland A first. ▪ Re-vegetate cleared lands with native grass species. ▪ Minimize impacts to breeding birds (April 15 to August 1) by working outside of the breeding season. Should clearing be required during the breeding bird season, nest searches conducted by a qualified person must be completed 48 hours prior to clearing. If nest are found, then work can not occur within the timing window. If there are no nests, then clearing can occur. Construction may occur on cleared lands during this time period provided that no additional vegetation must be cleared. ▪ Maintain a clearly demarcated boundary where no works occur within a minimum 30 m of a wetland boundary. ▪ The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. A protocol will be provided to contractors to follow in the event wildlife is encountered. ▪ Noise abatement devices will be utilized on construction and support equipment present on the site with objective of keeping the noise level within the acceptable construction noise standards and help maintain air quality. 	<p>No direct loss of wetland habitat will occur and a minimum 30 m buffer from the wetland habitat will be maintained. Habitat is not limited in the area.</p> <p>Losses attributed to habitat buffer and not direct habitat or waterfowl population.</p> <p>Direct loss of 2.30 ha of the 100 m radius buffer surrounding WSSA D1[†]. Accounts for 9% of total area.</p> <p>Direct loss of 2.46 ha of the 100 m radius buffer surrounding WSSA D2[†]. Accounts for 15% of total area.</p> <p>Direct loss of 2.41 ha of the 100 m radius buffer surrounding WSSA D3[†]. Accounts for 17% of total area.</p>

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			Physical Impact (Direct)	Functional Effect (Indirect)					
Bat Maternity Colonies									
<p>Bat Maternity Colonies (BMC D1[†])</p> <p>Pre-construction surveys will be conducted at BMC D1 according to methodology presented in the NHA Evaluation of Significance Addendum Report. These surveys will take place in 2014.</p> <p>This habitat has been treated as significant until the evaluation can occur. Please note the mitigation measures outlined will only be undertaken if the habitat is evaluated to be significant after pre-construction surveys are complete.</p>	<p>Construction Activities- Vegetation Clearing and Grubbing</p>	<p>Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of BMC D1.</p>	<ul style="list-style-type: none"> ▪ Removal of 7.86 ha of habitat (estimated number of snag/cavity trees in area to be cleared = 94) ▪ Displacement to species inhabiting the natural feature ▪ If unmitigated, mortality of animal species inhabiting the natural feature during seasonal utilization of the feature. 	<ul style="list-style-type: none"> ▪ Declines in local bat populations and species richness ▪ Avoidance of habitat 	<p>Low</p> <p>Total habitat loss is approximately 6.3 % of potential bat habitat within Woodland A (see Appendix A, Evaluation of Significance Addendum Report).</p>	<p>Once during construction</p>	<p>Construction phase during maternity roosting period</p>	<ul style="list-style-type: none"> ▪ Pre-construction surveys will be undertaken to confirm habitat use by bats within the natural features. ▪ If through detailed design it is determined that a reduction of the project footprint is possible, reasonable efforts will be undertaken to avoid Woodland A. This would be dependent on a variety of factors, including but not limited to input from the participating landowners. Re-vegetate cleared lands with native grass species. ▪ Re-vegetate cleared lands with native grass species. ▪ Avoid impacts to bat species by working outside of the roosting period (May 1 to September 30). ▪ The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. ▪ Noise abatement devices will be utilized on construction and support equipment present on the site with objective of keeping the noise level within the acceptable construction noise standards and help maintain air quality. ▪ A restoration/replacement plan will be created within one year of the habitat being evaluated as significant, in consultation with and agreed upon by MNR. Should the habitat be evaluated to be not significant, a restoration/replacement plan for the delineated habitat will not be required. ▪ Replacement of bat habitat will be at a 	<p>Direct loss of 7.86 ha of Bat Maternity Colonies habitat (BMC D1[†]).</p> <p>Losses attributed to habitat and not bat population. It is anticipated that local population will use other maternity roost located in the Woodland A. Total area of habitat removal is 6.3% of overall habitat extent.</p>

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			Physical Impact (Direct)	Functional Effect (Indirect)					
								minimum of 1:1 ratio for all habitat that will be removed. <ul style="list-style-type: none"> Replacement habitat will be connected to an existing FOD or FOM community, the same or similar size of the original habitat. Location of the replacement habitat will be determined in consultation with MNR, with preference of it being located in the same geographic township. The owner of the land where the replacement habitat will occur will enter in an agreement where by the trees will not be cut for a time agreed upon by MNR. Monitoring of the replacement habitat will occur in the 1st, 2nd, and 5th year to monitor habitat growth. Monitoring will then be required once every five years until the end of the agreement or until agreed upon in consultation with MNR. All monitoring and assessments are to be conducted by a qualified biologist or forester. 	
Reptile Hibernaculum									
Reptile Hibernaculum (SH D1 [†]) Reptile Hibernaculum (SH D2 [‡]) Pre-construction surveys will be conducted at SH D1, and SH D2	Construction Activities- Vegetation Clearing and Grubbing Construction Activities – Installation of racking units	Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of Reptile Hibernaculum SH D1 [†] and SH D2 [‡] .	<ul style="list-style-type: none"> Direct disturbance of 2 reptile hibernacula habitats (areas contain numerous opening/ exit points to potential hibernacula) Disturbance to species inhabiting the natural feature Mortality of animal species travelling to/from and/or 	<ul style="list-style-type: none"> Declines in local snake population size and species richness. 	Low. Overall habitat will remain in place post-construction.	Once during construction	Construction phase during overwintering season	<ul style="list-style-type: none"> Pre-construction surveys will be undertaken to confirm habitat use by reptiles within the natural features. Seasonally adjust construction and decommissioning activities to minimize impacts to overwintering snakes by avoiding installation of racking units during overwintering season (October 1 to March 31). Infrastructure will not be installed within known entrances to reptile hibernacula. If determined to not impact effective 	Direct loss of land cover over two snake hibernacula (SH D1, SH D2). Note, hibernacula will remain following construction phase 23.52 ha of land cover over Reptile Hibernaculum (SH

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			Physical Impact (Direct)	Functional Effect (Indirect)					
<p>according to methodology presented in the NHA Evaluation of Significance Addendum Report.. These surveys will take place in 2014.</p> <p>This habitat has been treated as significant until the evaluation can occur. Please note the mitigation measures outlined will only be undertaken if the habitat is evaluated to be significant after pre-construction surveys are complete.</p>			inhabiting the natural feature during seasonal utilization.				<p>stormwater management of the project, removed materials consisting of rocks, soil, and woody debris will be placed along the woodland edge to the north of the project location to create habitat for reptiles and small mammals. Materials should be placed in a linear fashion no more than two to five metres high. Pile will only consist of natural material.</p> <ul style="list-style-type: none"> ▪ The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. A protocol will be provided to contractors to follow in the event wildlife is encountered. Specifically, staff will be educated on snake identification and avoidance procedures. ▪ Noise abatement devices will be utilized on construction and support equipment present on the site with the objective of keeping the noise level within the acceptable construction noise standards and help maintain air quality. ▪ Vehicle speeds will be restricted to 15 km/hr or less on the Project site and speed limit signage posted. 	<p>D1) will be cleared.</p> <p>3.34 ha of land cover over Reptile Hibernaculum (SH D2) will be cleared.</p>	
Waterfowl Nesting Areas									
Waterfowl Nesting Areas (WNA D1 [†])	Construction Activities- Vegetation Clearing and Grubbing	Solar panels, inverters, access roads, and fence will all be constructed	<ul style="list-style-type: none"> ▪ Loss of habitat ▪ Disturbance to species inhabiting the natural feature 	<ul style="list-style-type: none"> ▪ Declines in local waterfowl populations and species richness 	Low because much of the habitat to be removed includes conifer tree and meadow vegetation not expected to be used by breeding	Once during construction	Construction phase during nesting period	<ul style="list-style-type: none"> ▪ Pre-construction surveys will be undertaken to confirm habitat use by waterfowl within the natural features. ▪ Minimize impacts to breeding waterfowl 	Direct loss of 3.31 ha of Waterfowl Nesting Area (WNA D1). Accounts for

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			Physical Impact (Direct)	Functional Effect (Indirect)					
<p>Waterfowl Nesting Areas (WNA D2[†])</p> <p>Pre-construction surveys will be conducted at WNA D1, and WNA D2 according to methodology presented in the NHA Evaluation of Significance Addendum Report.. These surveys will take place in 2014.</p> <p>This habitat has been treated as significant until the evaluation can occur. Please note the mitigation measures outlined will only be undertaken if the habitat is evaluated to be significant after pre-construction surveys are complete.</p>		<p>within the area delineated as part of WNA D1 and WNA D2.</p>	<ul style="list-style-type: none"> ▪ If unmitigated, potential for mortality of animal species inhabiting the natural feature during seasonal utilization of the feature. 	<ul style="list-style-type: none"> ▪ Avoidance of habitat 	<p>waterfowl.</p>			<p>(April 1 to July 15) by clearing vegetation outside of the breeding season. Should clearing be required during the breeding bird season, nest searches conducted by a qualified person must be completed within 48 hours of vegetation removal. If nest are found, then work can not occur within the timing window. If there are no nests, then clearing can occur. Construction may occur on cleared lands during this time period provided that no additional vegetation must be cleared.</p> <ul style="list-style-type: none"> ▪ The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. A protocol will be provided to contractors to follow in the event wildlife is encountered. ▪ Noise abatement devices will be utilized on construction and support equipment present on the site with the objective of keeping the noise level within the acceptable construction noise standards and help maintain air quality. 	<p>21% of total area and includes mostly conifer trees.</p> <p>Direct loss of 3.52ha of Waterfowl Nesting Area (WNA D2). Accounts for 22% of total area and includes only meadow.</p> <p>Losses attributed to habitat and not waterfowl population. It is anticipated that local population will use other breeding habitat located in the general area.</p>
Amphibian Breeding Habitat (Woodland)									

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			Physical Impact (Direct)	Functional Effect (Indirect)					
<p>Amphibian Breeding Habitat (Woodland; ABF D1[†])</p> <p>Pre-construction surveys will be conducted at ABF D1.</p> <p>These surveys will take place in 2014 according to methodology presented in the NHA Evaluation of Significance Addendum Report. The habitat has been treated as significant until the evaluation can occur. Please note the mitigation measures outlined will only be undertaken if the habitat is evaluated to be significant after pre-construction surveys are complete.</p>	<p>Construction Activities- Vegetation Clearing and Grubbing</p>	<p>Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of Amphibian Breeding Habitat (Woodlands) ABF D1[†].</p>	<ul style="list-style-type: none"> ▪ Loss of habitat ▪ Habitat and sensory disturbance to species inhabiting the natural feature. ▪ Mortality of species inhabiting the natural feature during seasonal utilization of the feature 	<ul style="list-style-type: none"> ▪ Avoidance of habitat by woodland amphibian breeding populations. 	<p>Low.</p> <p>Overall percentage of direct habitat to be removed is approximately 1%</p>	<p>Once during Construction</p>	<p>Construction phase during breeding period.</p>	<ul style="list-style-type: none"> ▪ Pre-construction surveys will be undertaken to confirm habitat use by amphibians within the natural features. ▪ For significant habitat within the project location, the habitat is to be removed outside of the amphibian breeding season (i.e., April 1-June 30). A visual inspection of the breeding habitat (i.e., wetland pockets/pools) will be undertaken prior to removal if clearing occurs from July 1 to August 30 to verify if amphibians are observed. If observed, construction within 30 m of the breeding pool will be delayed until a subsequent site visit confirms no visual evidence of amphibians. ▪ The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. A protocol will be provided to contractors to follow in the event wildlife is encountered. ▪ Noise abatement devices will be utilized on construction and support equipment present on the site with the objective of keeping the noise level within the acceptable construction noise standards and help maintain air quality. ▪ Vehicle speeds to be restricted to 15 km/hr or less on the Project site and speed limit signage posted. 	<p>Loss of 19.54 ha of amphibian breeding habitat, an 11 % decrease in woodland area.</p> <p>Losses attributed to habitat and not amphibian population. It is anticipated that local population will use adjacent wetlands and other breeding ponds located in Woodland A.</p> <p>Small wetland areas to be removed as part of this habitat account for less than 1 % of total available mapped wetland habitat within overall woodland area.</p>

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
<p>Amphibian Breeding Habitat (Woodland; ABF D1[†])</p> <p>Pre-construction surveys will be conducted at ABF D1.</p> <p>These surveys will take place in 2014 according to methodology presented in the NHA Evaluation of Significance Addendum Report.</p> <p>The habitat has been treated as significant until the evaluation can occur. Please note the mitigation measures outlined will only be undertaken if the habitat is evaluated to be significant after pre-construction surveys are complete.</p>	<p>All phases- Use of vehicles and machinery during construction, operations, and decommissioning.</p>	<p>Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of Amphibian Breeding Habitat (Woodlands) ABF D1[†].</p>	<ul style="list-style-type: none"> ▪ Emissions- Potential for air pollution from dust and emissions from construction vehicles and machinery and equipment. Overall impact to air quality during construction, operations, and decommissioning ▪ Leaks and Spills- Potential for leak or spill of fuel and other deleterious substances from vehicles and machinery that affect wetland wildlife, vegetation, or contaminate water and the soil. 	<ul style="list-style-type: none"> ▪ Reduction in air quality ▪ Reduction in water and soil quality 	<p>Low</p> <p>Emissions- Slight change to temporary air quality</p> <p>Leaks and Spills- Minimal localized effect.</p>	<p>Once during construction</p> <p>Minimal during operations</p> <p>Once during decommissioning</p>	<p>Short-term</p>	<ul style="list-style-type: none"> ▪ All vehicles, machinery and equipment must be maintained and equipped with emission controls, as applicable by provincial standards. ▪ Construction work shall be carried out as according to Canadian Environmental Protection Act (CEPA), and applicable air emission regulations and by-laws. ▪ Implement best management practices (BMPs) and establish an emergency spill plan. ▪ Ensure that emergency spill kit is available at the Project Location at all times in the event that a spill occurs. All spills and leaks of deleterious substances must be immediately contained and cleaned up in accordance with Provincial regulatory requirements and reported immediately to the Ontario Spills Action Centre (1-800-268-6060). ▪ Excess material will be removed from the site. ▪ No refuelling or maintenance of vehicles within 30 m of natural features. ▪ Maintain log book of any spills and mitigation measures. ▪ A crushed stone-tracking pad, or similar, will be installed at the site access to reduce tracking of sediment onto adjacent roadways during construction activities. Street sweeping and cleaning may be scheduled if necessary. 	<p>Some emissions will be generated during project activities with no net adverse effect to significant natural features.</p> <p>Low potential for residual effects of leaks and spills if mitigation measures applied.</p>

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
<p>Amphibian Breeding Habitat (Woodland; ABF D1[†])</p> <p>Pre-construction surveys will be conducted at ABF D1 according to methodology presented in the NHA Evaluation of Significance Addendum Report.</p> <p>These surveys will take place in 2014. The habitat has been treated as significant until the evaluation can occur. Please note the mitigation measures outlined will only be undertaken if the habitat is evaluated to be significant after pre-construction surveys are complete.</p>	<p>Construction and Decommissioning- Storage and movement of materials</p>	<p>Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of Amphibian Breeding Habitat (Woodlands) ABF D1[†].</p>	<ul style="list-style-type: none"> ▪ No direct effect on woodland area adjacent to project location following vegetation clearing of woodland within project location. 	<ul style="list-style-type: none"> ▪ Sedimentation ▪ Release of dust and soil particles into woodlands 	<p>Low</p>	<p>Once during construction</p> <p>Once during decommissioning</p>	<p>Short-term increase of sedimentation until vegetative buffers have been restored</p>	<ul style="list-style-type: none"> ▪ Use controlled work procedures in order to eliminate release of dust from construction works. Mist can be applied to reduce dust releases (e.g., water mist or non-chloride based materials) ▪ Minimize activities with potential for dust releases especially during windy and prolonged dry periods. ▪ Stabilize areas of stockpiled or exposed soils. ▪ Materials that have potential of releasing dust or airborne particle must be covered during their transport, installation or removal e.g., by trapping, mulching, re-vegetating or watering in order to create a crusted surface. ▪ Minimize vehicle traffic adjacent to wetlands, or exposed soils. All traffic to use designated areas. ▪ Restore disturbed areas as soon as possible to minimize the duration of soil exposure. 	<p>Some fugitive dust during preparation from project activities will be generated.</p> <p>Site preparation activities will be temporary and short (months) duration. No effects from dust are anticipated in operations phase.</p> <p>No adverse effects on natural features are anticipated with implementation of mitigation measures.</p>

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
<p>Amphibian Breeding Habitat (Woodland; ABF D1[†])</p> <p>Pre-construction surveys will be conducted at ABF D1 according to methodology presented in the NHA Evaluation of Significance Addendum Report..</p> <p>These surveys will take place in 2014. The habitat has been treated as significant until the evaluation can occur. Please note the mitigation measures outlined will only be undertaken if the habitat is evaluated to be significant after pre-construction surveys are complete.</p>	<p>Construction and Grading, Ditching, and Trenching</p>	<p>Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of Amphibian Breeding Habitat (Woodlands) ABF D1[†].</p>	<ul style="list-style-type: none"> ▪ Soil erosion as a result of grading, digging, and trenching. Portions of the Project Location and stockpiled material being exposed to erosion processes, including wind and surface run-off. ▪ Short-term hydrological changes- Potential short-term changes to surface water hydrology and drainage to/from natural features. Potential increase in surface water runoff due to grading or ditching associated with access roads, soil compaction, and/or the removal of vegetation. 	<ul style="list-style-type: none"> ▪ Increased sedimentation in wetlands ▪ Altered water levels in wetlands 	<p>Low.</p>	<p>Once during construction</p> <p>Once during decommissioning</p>	<p>Short-term</p>	<ul style="list-style-type: none"> ▪ Limits of construction work to be staked in the field in order to minimize disturbance to the wetland habitat and wildlife. Construction envelope to be clearly demarcated and kept as small as possible. ▪ Develop and implement an erosion and sediment control plan. The proposed preparation activities will be designed and implemented so as not to alter off-site drainage patterns and will not significantly alter the elevations throughout the Project Location. ▪ Internal project access roads to be constructed at or near grade and the use of impermeable materials avoided to promote groundwater recharge. ▪ The project does not require extensive dewatering. An erosion and sediment control plan will be in place to prevent stormwater runoff from entering open excavations (e.g., hay bales, sediment bags). ▪ Flow retention features will be used in ditches to mitigate increases in surface water run-off (e.g., straw bales or rock-fill flow checks). ▪ Soil stabilization along with seeding/planting as needed to stabilize soil upon completion of work activities to attenuate runoff 	<p>Erosion effects are Short-term measures will avoid any impacts to adjacent natural features or municipal drains.</p> <p>Maintenance of existing local drainage patterns will ensure no offsite changes to natural features or municipal drainage system.</p>
Marsh Breeding Bird Habitat									

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
<p>Marsh Breeding Bird Habitat (MBB D2[†])</p> <p>Pre-construction surveys will be conducted at MBB D2 according to methodology presented in the NHA Evaluation of Significance Addendum Report..</p> <p>These surveys will take place in 2014. The habitat has been treated as significant until the evaluation can occur. Please note the mitigation measures outlined will only be undertaken if the habitat is evaluated to be significant after pre-construction surveys are complete.</p>	<p>Construction Activities- Vegetation Clearing and Grubbing</p>	<p>Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of MBB D2.</p>	<ul style="list-style-type: none"> ▪ Loss of habitat ▪ Disturbance to species inhabiting the natural feature ▪ Mortality of animal species inhabiting the natural feature during seasonal utilization of the feature. 	<ul style="list-style-type: none"> ▪ Declines in local marsh bird populations and species richness ▪ Avoidance of habitat 	<p>Low. Habitat not limited in general area of the project.</p>	<p>Once during construction</p>	<p>Construction phase during maternity roosting period</p>	<ul style="list-style-type: none"> ▪ Pre-construction surveys will be undertaken to confirm habitat use by marsh breeding birds within the natural features. ▪ Minimize impacts to breeding birds (April 15 to August 1) by working outside of the breeding season. Should clearing be required during the breeding bird season, nest searches conducted by a qualified person must be completed within 48 hours of clearing. If nest are found, then work can not occur within the timing window. If there are no nests, then clearing can occur. Construction may occur on cleared lands during this time period provided that no additional vegetation must be cleared. ▪ The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. A protocol will be provided to contractors to follow in the event wildlife is encountered. ▪ Noise abatement devices will be utilized on construction and support equipment present on the site with the objective of keeping the noise level within the acceptable construction noise standards and help maintain air quality. 	<p>Loss of 0.03 ha of Marsh Breeding Bird Habitat (MBB D2[†]). Loss is less than 1% of identified and generalized Marsh Breeding Bird Habitat identified in the Site Investigation Addendum report.</p> <p>Losses attributed to habitat and not marsh bird population. It is anticipated that local population will use other breeding habitat located in the general area.</p>

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
Open Country Breeding Bird Habitat									
Open Country Breeding Bird Habitat (OCBB D1 (9*))	Construction Activities- Vegetation Clearing and Grubbing	Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of OCBB D1 (9*).	<ul style="list-style-type: none"> ▪ Loss of habitat ▪ Disturbance to species inhabiting the natural feature ▪ Mortality of animal species inhabiting the natural feature during seasonal utilization of the feature. 	<ul style="list-style-type: none"> ▪ Declines in local Open Country Breeding Bird populations and species richness ▪ Avoidance of habitat 	Low. Habitat not limited in general area of the project.	Once during construction	Construction phase	<ul style="list-style-type: none"> ▪ Please refer to original NHA report prepared by AMEC, Appendix B- Table 5-1 for Open Country Breeding Bird Habitat (OCBB D1 [9*]). 	<p>Loss of 63.46 ha of Open Country Breeding Bird Habitat. Loss is 22% of entire feature.</p> <p>Habitat is not limiting. In the area.</p> <p>Losses attributed to habitat and not Open Country Breeding Bird population. It is anticipated that local population will use other breeding and foraging habitat located in the general area.</p>
Shrub/Early Successional Breeding Bird Habitat									
Shrub/Early Successional Breeding Bird Habitat (SSB4*)	Construction Activities- Vegetation Clearing and Grubbing	Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of SSB 4*	<ul style="list-style-type: none"> ▪ Loss of habitat ▪ Disturbance to species inhabiting the natural feature ▪ Mortality of animal species inhabiting the natural feature during seasonal utilization of the feature. 	<ul style="list-style-type: none"> ▪ Declines in local Shrub/Early Successional Breeding Bird populations and species richness ▪ Avoidance of habitat 	Low. Habitat not limited in general area of the project.	Once during construction	Construction phase	<ul style="list-style-type: none"> ▪ Please refer to original NHA report prepared by AMEC, Appendix B- Table 5-1 for Shrub/Successional Breeding Bird Habitat (SBB 4*). 	<p>Loss of 5.34 ha of Shrub/ Early Successional Breeding Bird Habitat. Loss is 33% of entire feature.</p> <p>Habitat is not limiting in the area.</p> <p>Losses attributed</p>

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
									to habitat and not Shrub/ Early Successional Breeding Bird population. It is anticipated that local population will use other breeding and foraging habitat located in the general area.

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
Habitat for Common Nighthawk									
<p>Habitat for Common Nighthawk (CN D1[†])</p> <p>Pre-construction surveys will be conducted at CN D1 according to methodology presented in the NHA Evaluation of Significance Addendum Report.</p> <p>These surveys will take place in 2014. The habitat has been treated as significant until the evaluation can occur. Please note the mitigation measures outlined will only be undertaken if the habitat is evaluated to be significant after pre-construction surveys are complete.</p>	<p>Construction Activities- Vegetation Clearing and Grubbing</p>	<p>Solar panels, inverters, access roads, and fence will all be constructed within the area delineated as part of CN D1.</p>	<ul style="list-style-type: none"> ▪ Loss of habitat ▪ Disturbance to species inhabiting the natural feature ▪ Mortality of animal species inhabiting the natural feature during seasonal utilization of the feature. 	<ul style="list-style-type: none"> ▪ Declines in local Common Nighthawk populations and species richness ▪ Avoidance of habitat 	<p>Low. Habitat not limited in general area of the project.</p>	<p>Once during construction</p>	<p>Construction phase</p>	<ul style="list-style-type: none"> ▪ Pre-construction surveys will be undertaken to confirm habitat use by common nighthawk within the natural features. ▪ Minimize impacts to breeding birds (April 15 to August 1) by working outside of the breeding season. Should clearing be required during the breeding bird season, nest searches conducted by a qualified person must be completed within 48 hours of clearing. If nest are found, then work can not occur within the timing window. If there are no nests, then clearing can occur. Construction may occur on cleared lands during this time period provided that no additional vegetation must be cleared. ▪ The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. A protocol will be provided to contractors to follow in the event wildlife is encountered. ▪ Noise abatement devices will be utilized on construction and support equipment present on the site with the objective of keeping the noise level within the acceptable construction noise standards and help maintain air quality. 	<p>Loss of 19.54 ha of Habitat for Common Nighthawk (CN D1[†]). Loss is 38% of entire feature.</p> <p>Habitat is not limiting in the area.</p> <p>Losses attributed to habitat and not Common Nighthawk population. It is anticipated that local population will use other breeding and foraging habitat located in the general area.</p>

Significant or Provincially Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical Impact (Direct)	Functional Effect (Indirect)					
Generalized Candidate Significant Wildlife Habitat									
Various habitats	General Construction Activities	> 30 m	<ul style="list-style-type: none"> ▪ None. All project components are located at least 30 m from feature. 	<ul style="list-style-type: none"> ▪ Habitat Avoidance ▪ Sensory disturbance to species inhabiting the natural feature 	Low due to construction activities not occurring within habitats.	Once during Construction	Short-term	<ul style="list-style-type: none"> ▪ Delineate construction area with stakes and flagging ▪ The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. A protocol will be provided to contractors to follow in the event wildlife is encountered. ▪ Noise abatement devices will be utilized on construction and support equipment present on the site with the objective of keeping the noise level within the acceptable construction noise standards and help maintain air quality. 	There is low potential for residual effects once mitigation measures applied.

‡ denotes 'treated as' significant and pre-construction surveys will be completed to evaluate wildlife habitat; * Indicates identifier used in original AMEC prepared NHA reports.

10. Environmental Effects Monitoring Plan

The environmental effects monitoring plan (EEMP) prepared for the Sol-luce Kingston Solar PV Energy Project outlines the mitigation measures to minimize the environmental effects of engaging in this renewable energy project (**Table 7**). The mitigation measures outlined in **Table 7** below are in response to the physical impacts and function effects that have the potential to occur during the construction, design and operation, and decommissioning of the facility and are specific to significant natural heritage features, including those treated as significant, outlined in **Table 2, 3, and 4**. These will form part of the overall EEMP for the project and will be referenced in the *REA Modifications Document* being prepared to support the Major Design Change for the project. **Table 7** also summarizes the monitoring plan and monitoring frequency during operation of the facility, as well as contingency measures that will be undertaken if performance objectives are not achieved. **Table 7** should be read in conjunction with **Table 5 and 6** which outline the features and attributes necessary for persistence, features potentially sensitive to development and features that serve as good indicator features or species.

Table 7: Environmental Effects Monitoring Plan

Significant/ Provincially Significant Natural Feature(s) Affected by Activity	Potential Positive/Negative Environmental Effects	Performance Objective	Environmental Effects Monitoring Plan					Contingency Measures
			Mitigation Strategy	Monitoring Strategy & Methods	Monitoring Locations	Frequency & Duration	Reporting Requirements	
Site Preparation and Construction								
<p>(Assumed) Provincially Significant Wetlands 8 ,9, 10.</p> <p>Treated as Significant Waterfowl Stopover and Staging Areas (Aquatic) (WSSA D1, WSSA D2, and WSSA D3) (See row below for monitoring plan)</p> <p>Treated as Significant Amphibian Breeding Habitat (Woodland) ABF D1. (See row below for monitoring plan)</p> <p>Generalized Candidate Significant Wildlife Habitat</p>	Disturbance to natural feature potentially resulting in temporary increased sedimentation, decreased water quality, and avoidance by wildlife.	Continued use of the natural feature by wildlife where habitat will persist post-construction and to minimize temporary impacts.	<ul style="list-style-type: none"> ▪ Minimize impacts to breeding birds (April 15 to August 1) by working outside of the breeding season. Should clearing be required during the breeding bird season, nest searches conducted by a qualified person must be completed 48 hours prior to clearing activities. If nest are found, then work can not occur within the timing window. If there are no nests, then clearing can occur. Construction may occur on cleared lands during this time period provided that no additional vegetation must be cleared. ▪ Limits of construction work to be staked in the field in order to minimize disturbance to the wetland habitat and wildlife. Construction envelope to be clearly demarcated and kept as small as possible. ▪ The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. A protocol will be provided to contractors to follow in the event wildlife is encountered. ▪ Re-vegetate cleared lands with native grass species post-construction ▪ Develop and implement an erosion and sediment control plan. The proposed preparation activities will 	<p>Monitor erosion and sediment control (ESC) measures regularly during site preparation and construction.</p> <p>Monitor effectiveness of water flow management measures; ensure flow is free of sedimentation.</p>	<p>Around the perimeter of project location where ESC measures implemented.</p> <p>Monitor for surface water run-off flow and evidence of erosion to the wetland area.</p>	<p>Monitor ESC measures regularly during construction.</p> <p>Post-construction ESC monitoring to occur monthly or after rain events 10 mm or greater (within 24 hrs) until vegetation is re-established.</p>	<p>ESC inspection log compiled for each monitoring event.</p>	<p>Repair deficiencies in ESC structures as soon as possible upon notification of breach in ESC structure and buffer fencing.</p>

Significant/ Provincially Significant Natural Feature(s) Affected by Activity	Potential Positive/Negative Environmental Effects	Performance Objective	Environmental Effects Monitoring Plan					Contingency Measures
			Mitigation Strategy	Monitoring Strategy & Methods	Monitoring Locations	Frequency & Duration	Reporting Requirements	
			<p>be designed and implemented so as not to alter off-site drainage patterns and will not significantly alter the elevations throughout the Project Location.</p> <ul style="list-style-type: none"> Internal project access roads to be constructed at or near grade and the use of impermeable materials avoided to promote groundwater recharge. The project does not require extensive dewatering. An erosion and sediment control plan will be in place to prevent stormwater runoff from entering open excavations (e.g., hay bales, sediment bags). 					
<p>Significant Woodland A</p> <p>Treated as Significant Waterfowl Stopover and Staging Areas (Aquatic) (WSSA D1, WSSA D2, and WSSA D3)</p> <p>Treated as Significant Bat Maternity Colonies (BMC D1)</p> <p>Treated As Significant Reptile Hibernaculum (SH D1, and SH D2)</p> <p>Treated as Significant Waterfowl Nesting Area (WNA D1 and WNA D2)</p> <p>Treated as Significant Amphibian Breeding Habitat (Woodland) (ABF D1)</p> <p>Treated as Significant Marsh Breeding Bird Habitat (MBB</p>	<p>Disturbance to natural feature potentially resulting in temporary increased sedimentation and avoidance by wildlife.</p> <p>Permanent removal of 19.54 ha of Woodland A and Amphibian Breeding Habitat (Woodland) (ABF D1)</p> <p>Permanent removal of 2.3 ha of Waterfowl Stopover and Staging Area (Aquatic) (WSSA D1).</p> <p>Permanent removal of 2.46 ha of Waterfowl Stopover and Staging Area (Aquatic) (WSSA D2).</p> <p>Permanent removal of 2.41 ha of Waterfowl Stopover and Staging Area (Aquatic) (WSSA D3).</p> <p>Permanent removal of 7.86 ha of Bat Maternity Colonies (BMC D1).</p> <p>Permanent removal of 3.31 ha of Waterfowl Nesting Area (WNA D1).</p> <p>Permanent removal of 3.52 ha of Waterfowl Nesting Area (WNA D2).</p>	<p>Continued use of the natural feature by wildlife and minimized temporary impacts.</p>	<ul style="list-style-type: none"> Limits of construction work to be staked in the field in order to minimize disturbance to the woodland habitat and wildlife. Construction envelope to be clearly demarcated and kept as small as possible. When woodland clearing is taking place the area will be staked and monitored to ensure that no additional woodland is cleared during the clearing.. If through detailed design it is determined that a reduction of the project footprint is possible, reasonable efforts will be undertaken to avoid Woodland A. This would be dependent on a variety of factors, including but not limited to input from the participating landowners. Re-vegetate cleared lands with native grass species. Minimize impacts to breeding birds (April 15 to August 1) by working 	<p>Monitoring of woodland clearing boundary while vegetation is being cleared.</p> <p>Monitor erosion and sediment control (ESC) measures regularly during site preparation and construction.</p> <p>Monitor effectiveness of water flow management measures; ensure flow is free of sedimentation.</p> <p>Visual assessment of edge vegetation at newly created woodland edge.</p> <p>Pre-construction surveys to evaluate the significance of WSSA D1-D3, BMC D1, SH D1-D2,</p>	<p>Staked vegetation clearing boundary.</p> <p>Around the perimeter of project location where ESC measures implemented.</p> <p>Monitor for surface water run-off flow and evidence of erosion to the wetland area.</p> <p>Reptile surveys at Reptile Hibernacula</p>	<p>Monitoring of woodland clearing boundary to occur when vegetation is being cleared.</p> <p>Monitor ESC measures regularly during construction.</p> <p>Post-construction ESC monitoring to occur monthly or after rain events 10 mm or greater (within 24 hrs) until vegetation is re-</p>	<p>Woodland clearing inspection notes (e.g., field notes, photos, GPS locations).</p> <p>ESC inspection checklist log compiled for each monitoring event.</p> <p>Wildlife pre-construction and post-construction survey results to be submitted to the MNR for review.</p>	<p>Repair deficiencies in ESC structures as soon as possible upon notification of breach in ESC structure and buffer fencing.</p> <p>If use of significant wildlife habitats is not documented at levels equal to or near pre-construction densities, consultation with the MNR will be undertaken to discuss results.</p>

Significant/ Provincially Significant Natural Feature(s) Affected by Activity	Potential Positive/Negative Environmental Effects	Performance Objective	Environmental Effects Monitoring Plan					Contingency Measures
			Mitigation Strategy	Monitoring Strategy & Methods	Monitoring Locations	Frequency & Duration	Reporting Requirements	
<p>D2)</p> <p>Treated as Significant Habitat for Common Nighthawk (CN D1)</p> <p>Generalized Candidate Significant Wildlife Habitat</p>	<p>Permanent removal of 0.03 ha of Marsh Breeding Habitat buffer area (MBB D2).</p> <p>Permanent removal of 19.54 ha of Habitat for Common Nighthawk Area (CN D1).</p> <p>Permanent removals of land cover over reptile hibernacula.</p>		<p>outside of the breeding season. Should clearing be required during the breeding bird season, nest searches conducted by a qualified person must be completed. If nest are found, then work can not occur within the timing window. If there are no nests, then clearing can occur. Construction may occur on cleared lands during this time period provided that no additional vegetation must be cleared.</p> <ul style="list-style-type: none"> ▪ Avoid impacts to bat species by working outside of the roosting period (May 1 to September 30). Should tree removal be required during this period, a qualified biologist should inspect each cavity/snag tree for active roosts prior to removal. ▪ Seasonally adjust construction and decommissioning activities to minimize impacts to overwintering snakes by avoiding or minimizing installation of racking units during overwintering season (October 1 to March 31). ▪ For significant habitat within the project location, the habitat is to be removed outside of the amphibian breeding season (i.e., April 1-June 30). A visual inspection of the breeding habitat (i.e., wetland pockets/pools) will be undertaken prior to removal if clearing occurs from July 1 to August 30 to verify if amphibians are observed. If observed, construction within 30 m of the breeding pool will be delayed until a subsequent site visit confirms 	<p>WNA D1-D2, ABF D1, MBB D2, and CN D1. Methodology as outlined in the NHA Evaluation of Significance Addendum Report.</p> <p>Three years of post-construction reptile surveys in reptile hibernaculum habitats determined to be significant during pre-construction.</p> <p>Three years of post-construction avian surveys in WSSA, MBB, CN, and WNA habitats determined to be significant during pre-construction.</p> <p>Three years of post-construction bat acoustic surveys in bat habitat determined to be significant during pre-construction, where access is permitted</p> <p>Three year post-construction amphibian surveys at ABF D1 to determine species presence, abundance, and richness is not significantly different from pre-construction levels (Contingent on pre-</p>	<p>(see Figure 1, Appendix A)</p> <p>Avian surveys at waterfowl, marsh bird, Common Nighthawk habitats as outlined on Figure 1 in Appendix A and where accessible.</p> <p>Bat acoustic surveys in adjacent FOM community as outlined on Figure 1 in Appendix A and where accessible.</p> <p>Amphibian surveys at Amphibian Breeding Habitats as outlined on Figure 1 in Appendix A. Note, those survey points within project location will not be revisited post-construction.</p>	<p>established.</p> <p>Wildlife surveys (except for amphibian surveys) to be conducted during first appropriate season (i.e., within the appropriate survey timing window) post-construction for three years.</p> <p>Amphibian surveys to be conducted during first breeding season post-construction.</p>		

Significant/ Provincially Significant Natural Feature(s) Affected by Activity	Potential Positive/Negative Environmental Effects	Performance Objective	Environmental Effects Monitoring Plan					Contingency Measures
			Mitigation Strategy	Monitoring Strategy & Methods	Monitoring Locations	Frequency & Duration	Reporting Requirements	
			<p>no visual evidence of amphibians.</p> <ul style="list-style-type: none"> ▪ Vehicle speeds to be restricted to 15 km/hr or less on the Project site and speed limit signage posted. ▪ The construction workforce will be educated on local wildlife that may be encountered on Project Location and will be instructed to take measures for avoiding wildlife. A protocol will be provided to contractors to follow in the event wildlife is encountered. ▪ Re-vegetate cleared lands with native grass species post-construction ▪ If determined to not impact effective stormwater management of the project, removed materials consisting of rocks, soil, and woody debris will be placed along the woodland edge to the north of the project location to create habitat for reptiles and small mammals. Materials should be placed in a linear fashion no more than two to five metres high. Pile will only consist of natural material. <p>For BMC D1, the following applies:</p> <ul style="list-style-type: none"> ▪ A restoration/replacement plan will be created within one year of the habitat being evaluated as significant, in consultation with and agreed upon by MNR. Should the habitat be evaluated to be not significant, a restoration/replacement plan for the delineated habitat will not be required. ▪ Replacement of bat habitat will be at 	<p>construction surveys determining habitat significance).</p>				

Significant/ Provincially Significant Natural Feature(s) Affected by Activity	Potential Positive/Negative Environmental Effects	Performance Objective	Environmental Effects Monitoring Plan					Contingency Measures
			Mitigation Strategy	Monitoring Strategy & Methods	Monitoring Locations	Frequency & Duration	Reporting Requirements	
			<p>a minimum of 1:1 ratio for all habitat that will be removed.</p> <ul style="list-style-type: none"> ▪ Replacement habitat will be connected to an existing FOD or FOM community, the same or similar size of the original habitat. ▪ Location of the replacement habitat will be determined in consultation with MNR, with preference of it being located in the same geographic township. ▪ The owner of the land where the replacement habitat will occur will enter in an agreement where by the trees will not be cut for a time agreed upon by MNR. ▪ Monitoring of the replacement habitat will occur in the 1st, 2nd, and 5th year to monitor habitat growth. Monitoring will then be required once every five years until the end of the agreement or until agreed upon in consultation with MNR. ▪ All monitoring and assessments are to be conducted by a qualified biologist or forester. 					
<p>Significant Open Country Breeding Bird Habitat OCBB D1/9*.</p> <p>Significant Shrub/Successional Breeding Bird Habitat SBB 4*</p>	<p>Disturbance to natural feature potentially resulting in temporary increased sedimentation, decreased water quality, and avoidance by wildlife.</p> <p>Permanent removal of 63.46 ha of Open Country Breeding Bird Habitat (OCBB D1 (9*)).</p> <p>Permanent removal of 5.34 ha of Shrub/Early Successional Bird Breeding Habitat (SBB 4*).</p>	Continued use of the natural feature by wildlife and minimized temporary impacts.	<p>Please refer to original NHA report prepared by AMEC, Appendix B- Table 5.1.</p>	<p>Methodology as outlined in the NHA Evaluation of Significance Addendum Report.</p> <p>Three years of post-construction avian surveys in OCBB and SSB habitats determined to be significant during pre-construction.</p>	Avian surveys at OCBB and SSB habitats as outlined on Figure 1 in Appendix A and where accessible.	Wildlife surveys (except for amphibian surveys) to be conducted during first appropriate season (i.e., within the appropriate survey timing window) post-construction for	Wildlife pre-construction and post-construction survey results to be submitted to the MNR for review.	If use of significant wildlife habitats is not documented at levels equal to or near pre-construction densities, consultation with the MNR will be undertaken to discuss results.

Significant/ Provincially Significant Natural Feature(s) Affected by Activity	Potential Positive/Negative Environmental Effects	Performance Objective	Environmental Effects Monitoring Plan					Contingency Measures
			Mitigation Strategy	Monitoring Strategy & Methods	Monitoring Locations	Frequency & Duration	Reporting Requirements	
						three years.		

* Indicates identifier used in original AMEC prepared NHA reports.

11. Negative Environmental Effects, Design and Operations

The REA regulation requires an environmental effects monitoring plan as a part of the *Design and Operations Report* to demonstrate how negative environmental effects of the project will be mitigated, and set out a program for ongoing monitoring of the effectiveness of the mitigation measures. **Table 7** above provides a description of performance objectives in respect of each negative environmental effect; mitigation measures planned to achieve performance objectives; how the amended project is to be monitored; and a contingency plan to be implemented should monitoring reveal that mitigation measures have failed. **Table 7** has been prepared for inclusion in the Sol-luce Kingston Solar PV Energy Project *REA Modifications Document*. Additional mitigation measures proposed to minimize impacts of the amended facility and not related to natural features are also summarized in the *REA Modifications Document*.

12. Negative Environmental Effects, Construction

The REA regulation requires that a *Construction Plan Report* be prepared to demonstrate how negative environmental effects of construction activities will be mitigated including modifications to construction activities, use of treatment technologies (e.g., Erosion and Sediment Control structures), and scheduling of activities. **Table 7** above provides a description of performance objectives in respect of each negative environmental effect; mitigation measures planned to achieve performance objectives; how the project is to be monitored; and a contingency plan to be implemented should monitoring reveal that mitigation measures have failed. **Table 7** has been prepared for inclusion in Sol-luce Kingston Solar PV Energy Project *REA Modifications Document*. Additional mitigation measures proposed to minimize impacts of the facility and not related to natural features are also summarized in the *REA Modifications Document*.

13. Conclusions

Through addendums to the original NHA records review, site investigation and evaluation of significance, it was determined that significant and/or provincially significant natural features exist within the amended project location or prescribed setback areas (**Figure 3**). As such, an NHA EIS Addendum Report is required under Section 38 of Ontario Regulation 359/09. This fourth and final report therefore satisfies the requirements under Ontario Regulation 359/09 with respect to a natural heritage assessment addendum.

This NHA EIS Addendum Report demonstrates how negative environmental effects of the amended project location will be mitigated, and sets out a program for ongoing monitoring of the effectiveness of the mitigation measures. **Table 7** above provides a description of performance objectives in respect of each negative environmental effect; mitigation measures planned to achieve performance objectives; how the amended project location is to be monitored; and a contingency plan to be implemented should monitoring reveal that mitigation measures have failed. The NHA EIS Addendum Report was completed to mitigate any potential negative environmental effects to the following significant or provincially significant natural features (Please note that ‡ denotes 'treated as' significant and pre-construction surveys will be completed to evaluate wildlife habitat;* Indicates identifier used in original AMEC prepared NHA reports):

- Wetlands 8, 9, and 10
- Woodland A (WDL 18*)
- Seasonal Concentration Areas
 - Waterfowl Stopover and Staging Areas (Aquatic) (WSSA D1[‡], D2[‡], D3[‡])
 - Bat Maternity Colonies (BMC D1[‡])
 - Reptile Hibernaculum (SH D1[‡], and SH D2[‡])
- Specialised Wildlife Habitat
 - Waterfowl Nesting Areas (WFA D1[‡] and D2[‡])
 - Amphibian Breeding Habitat (Woodland) (ABF D1[‡])
- Habitat for Species of Conservation Concern
 - Marsh Breeding Bird Habitat (MBB D2[‡])

- Open Country Breeding Bird Habitat (OCBB D1 [OCCB 9*])
- Shrub/Successional Breeding Bird Habitat (SBB 4*)
- Habitat for Common Nighthawk (CN D1[‡])
- Generalized Candidate Significant Wildlife Habitat

Table 7 outlines how the activities related to the construction, operation and decommissioning of the facility affect these natural features and the appropriate mitigation and monitoring work to be implemented.

14. References

- AMEC. June 2012. Kingston Solar LP Sol-Luce Kingston Solar PV Energy Project: Natural Heritage Assessment and Environmental Impact Study. TC111406 168335-0002-160-RPT-0001.
- AMEC. August 2013. Kingston Solar LP Sol-Luce Kingston Solar PV Energy Project: Natural Heritage Assessment Amendment Report- Reptile and Amphibian Surveys and Assessment of Candidate Significant Wildlife Habitat. TC131409.
- City of Kingston. 2010. Official Plan. 348 pp.
- Loyalist Township. 2010. Official Plan. 163 pp.
- Ontario Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. 151pp.
- Ontario Ministry of Natural Resources (MNR), 2002. Ontario Wetland Evaluation System Southern Manual (3rd Edition). Revised December 2002.
- Ontario Ministry of Natural Resources (MNR). September 2009. Approval and Permitting Requirements Document for Renewable Energy Projects. September 24, 2009.
- Ontario Ministry of Natural Resources (MNR). January 2009. Significant Wildlife Habitat Ecoregion Criteria Schedules. Addendum to Significant Wildlife Habitat Technical Guide. Working Draft. 73pp.
- Ontario Ministry of Natural Resources (MNR). July 2011. Natural Heritage Assessment Guide for Renewable Energy Projects. Queen's Printer for Ontario. 99pp.
- Ontario Ministry of Natural Resources (MNR). February 2012. Significant Wildlife Habitat Ecoregion 6E Criterion Schedule. 42 pp.

Appendix A

Pre-Construction Surveys and Post-Construction Monitoring

1. Pre-construction Survey Methodology

Please find below details of the pre-construction surveys for wildlife habitat 'treated as' significant. The surveys will be conducted by qualified biologists during appropriate timing windows and using MNR approved methodologies.

1.1 Wildlife Habitat

The Significant Wildlife Habitat Technical Guide (MNR 2000), supported by the Significant Wildlife Habitat Ecoregion 6E Criterion Schedule (MNR 2012b), is the authoritative source for the identification and evaluation of significant wildlife habitat. Information collected to evaluate wildlife habitat as significant often requires specific studies targeted to the species, the habitat, or both. In some instances, when evaluating candidate wildlife habitat, consideration was given to the size of the individual habitat relative to the amount of habitat in the region (i.e., percentage of regional composition for a given habitat community within 10 km of the project location) and occurrence of unique characteristics. Methodologies used to investigate the candidate wildlife habitat identified during the site investigation are further outlined in below.

Where appropriate studies to determine the significance of a wildlife habitat have not been conducted, wildlife habitat will be treated as significant and studies will be completed prior to construction. The methods to be implemented in order to confirm the status of wildlife habitat treated as significant will be outlined in the EIS.

1.1.1 Seasonal Concentration Areas

Studies related to the evaluation of candidate Raptor Wintering Area and candidate Reptile Hibernaculum were completed as part of the original NHA (AMEC 2012). For details on methodology, please refer to Section 4.4.1.1 of that report for Raptor Wintering Area and Section 4.4.1.2 for Reptile (Snake) Overwintering Habitat. For

consistency, the candidate Reptile Hibernaculum identified in association with the project location on Sites 2 (SH D2) and 25 a/b (SH D1) will be evaluated using the same methodology as previously approved by the MNR. This will include basking surveys, the use of cover boards, and visual searches near potential reptile hibernaculum. The surveys and searches will occur within the candidate habitats at observed potential hibernaculum (see figure below for two observed in each habitat; field investigators observed numerous within the two habitats). Three surveys will occur at each habitat during April and May (surveys will be evenly spaced out). The only change to the survey methodology will be pre-construction surveys will be done during the period of egress in the spring rather than ingress in the fall.

Studies related to the evaluation of other candidate seasonal concentration areas are listed below. For the purposes of this report, these habitats have been treated as significant until those studies are complete.

1.1.1.1 Waterfowl Stopover and Staging Areas (Terrestrial/Aquatic)

For evaluation methodology related to Waterfowl Stopover and Staging Areas (Aquatic) (WSSA D1-D3), breeding bird surveys which follow methods outlined in the Ontario Breeding Bird Atlas Guide for Participants (Cadman et al 2007) will be completed within the habitat, where accessible, between from late May to early July 2014 (three surveys will occur evenly spaced over this time span). To supplement the survey, area searches of the habitat will be completed using binoculars to observe species presence and breeding activity. Specifically, breeding bird surveys consist of ten minute point counts that are used to establish quantitative estimates of bird abundance in major habitat types of the study area. Area searches involve noting all individual bird species and their corresponding breeding evidence while transversing the habitat on foot.

1.1.1.2 Bat Maternity Colonies

For evaluation methodology related to Bat Maternity Colonies (BMC D1), exit surveys will be conducted during the month of June (see *MNR Bats and Bat Habitats: Guidelines for Wind Power Projects*, 2011). These surveys will occur at a minimum of 10

snags/cavity trees as the habitat within the project location is less than 10 ha and site access restrictions limit surveys in the rest of the woodland. Should access to the entire woodland be granted, 30 snags/cavity trees will be surveyed. Survey points based on site investigation observations are included in an appendix of the *Environmental Impact Study Addendum Report* and will be surveyed with other snags/cavity trees found during pre-construction surveys. The best candidate snag/cavity trees will be selected following criteria in the guidelines; including, tallest snag/cavity trees; cavities and crevices likely originating as cracks, scars, knot holes or woodpecker crevices; trees with large diameter breast height; trees in areas of high density of snag/cavity trees; trees with large amounts of loose, peeling bark; trees with snag/cavity over 10 m up the tree; tree species (e.g., white pine, maple, aspen, and ash), open canopy; and, evidence of tree decay (decay Class 1-3 will be used) (MNR 2011). Specifically, during the month of June observers will monitor the opening or crevice for 30 minutes before dusk until 60 minutes after dusk for evidence of bats exiting (surveys will not be conducted in the rain). Observers will choose a viewing station with a clear aspect of the cavity opening or crevice. A bat detector (i.e., acoustic monitor that uses broadband bat detectors) will also be used. Only one survey is required at each candidate tree. If a maternity roost is found, then the entire ELC community is significant.

1.1.2 Specialised Wildlife Habitat

Studies related to the evaluation of candidate Woodland Raptor Nesting Habitat and candidate Amphibian Breeding Habitat (Woodland and Wetland) were completed as part of the original NHA (AMEC 2012). For details on methodology, please refer to Section 4.4.1.7 of that report for a description of the Woodland Raptor Nesting Habitat methodology previously confirmed as appropriate by the MNR. For candidate woodland and wetland Amphibian Breeding Habitat, the original NHA outlines the methodology used to evaluate one unit of candidate Amphibian Breeding Habitat (woodland) in Section 4.4.1.5. For those candidate Amphibian Breeding Habitat areas identified in the NHA Addendum, methodology to be used is outlined and studies are proposed for 2014

(i.e., prior to construction). For the purposes of this report, these habitats have been treated as significant until those studies are complete.

Studies related to the evaluation of candidate Waterfowl Nesting Area and Amphibian Breeding Habitat have been provided below in sections 6.3.2.1 and 6.3.2.2. For the purposes of this report, these habitats have been treated as significant until those studies are complete.

1.1.2.1 Waterfowl Nesting Area

For evaluation methodology related to Waterfowl Nesting Area (WNA D1 and D2) breeding bird surveys following methods outlined in the Ontario Breeding Bird Atlas Guide for Participants (Cadman et al 2007) will be completed within the habitat, where accessible, from late May to early July 2014 (three surveys will occur evenly spaced over this time span). To supplement the survey, area searches of the habitat will be completed using binoculars to observe species presence and breeding activity. Specifically, breeding bird surveys consist of ten minute point counts that are used to establish quantitative estimates of bird abundance in major habitat types of the study area. Area searches involve noting all individual bird species and their corresponding breeding evidence while transversing the habitat on foot.

1.1.2.2 Amphibian Breeding Habitat (Woodland)

Amphibian monitoring will follow the Marsh Monitoring Program protocol (Bird Studies Canada, 2009). Three different surveys will be conducted between April 1 and June 30, with at least two weeks between each survey. Surveys will begin at least one half hour after sunset during evenings with a minimum night temperature of 5°C, 10°C and 17°C for each of the three respective surveys. Survey points will align with wetland features observed within the habitat (survey points are included in an appendix of the *Environmental Impact Study Addendum Report*).

Each amphibian survey will generally involve standing at a predetermined station for 3 minutes and listening for frog calls. The calling activity of individuals estimated to be within 100 m of the observation point will be documented. All individuals beyond 100 m will be recorded as outside of the count circle and calling activity not recorded. Calling activity will then be ranked using one of the following three abundance code categories:

- Code 1: Calls not simultaneous, number of individuals can be accurately counted;
- Code 2: Some calls simultaneous, number of individuals can reliably be estimated;
- Code 3: Calls continuous and overlapping, number of individuals cannot be estimated.

In areas where appropriate habitat exists, vernal pools will also be visually examined for egg masses and amphibian larvae.

1.1.3 Habitat of Species of Conservation Concern

Studies related to evaluating the Habitat of Species of Conservation Concern were included in the original NHA (AMEC 2012) for the majority of the candidate habitat units identified in association with the amended project location. For the evaluation methodology related to the candidate Open Country Breeding Bird Habitat (OCBB D1), this habitat unit corresponds with OCBB9 in the original NHA (Section 4.4.1.4, AMEC 2012).

For evaluation methodology related to the candidate Shrub/Successional Breeding Bird Habitat (SBB4), this identifier was carried through to this addendum report from the original NHA (Section 4.4.3.1, AMEC 2012). Due to the change in the habitat boundaries, points BB100 and BB102 were used (see AMEC 2012, Appendix A, Figure 4-4f).

For evaluation methodology related to Habitat for Giant Swallowtail, the previously identified habitat unit (GS2) in the original NHA (AMEC 2012) will be carried forward for evaluation. Methodology used to evaluate this candidate habitat is outlined in Section 4.4.3.2 of the original NHA (AMEC 2012).

For those candidate habitats that were not evaluated as part of the original NHA (AMEC 2012), they will be treated as significant for the purposes of the NHA Addendum and studies completed prior to construction. Methodologies for these studies have been presented below.

1.1.3.1 Marsh Breeding Bird Habitat

For evaluation methodology related to Marsh Breeding Bird Habitat (MBB D2) breeding bird surveys which follow methods outlined in the Ontario Breeding Bird Atlas Guide for Participants (Cadman et al 2007) will be completed within the habitat, where accessible, from late May to July 2014 (three surveys will occur evenly spaced over this time span). To supplement the survey, area searches of the habitat will be completed using binoculars to observe species presence and breeding activity. Specifically, breeding bird surveys consist of ten minute point counts that are used to establish quantitative estimates of bird abundance in major habitat types of the study area. Area searches involve noting all individual bird species and their corresponding breeding evidence while transversing the habitat on foot.

1.1.3.2 Habitat for Common Nighthawk

For evaluation methodology related to Habitat for Common Nighthawk (CN D1), pre-construction crepuscular (nocturnal) bird surveys will be undertaken over two visits from May to early July during periods with at least 50% lunar illumination and low cloud cover. These surveys will follow the *Nightjar Monitoring Protocol* provided by the MNR (2011) and generally consist of point counts where suitable habitats for target species occur and are accessible.

2. Post-construction Survey Methodology

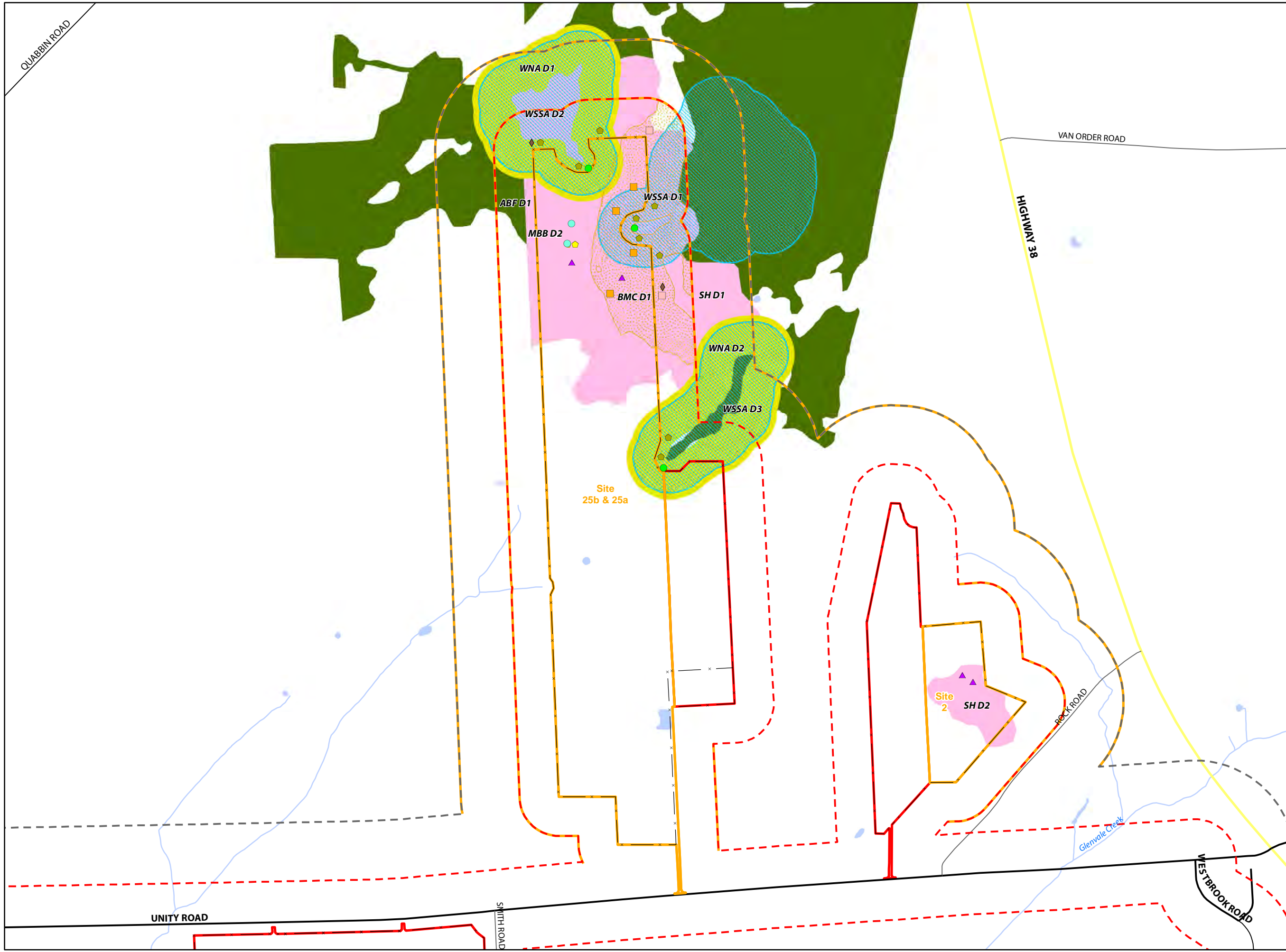
Post-construction monitoring will occur at survey locations indicated on Figure B in Appendix B. Methodologies for these surveys will follow the methods described above. Note, surveys will not be conducted within Marsh Breeding Bird Habitat (D2) or wetland areas within the project location due to the habitats being removed during construction.

One exception, with respect to methodology, is bat surveys will only consists of acoustic surveys due to the removal of candidate cavity/snag trees. Generally, the surveys will follow methods outlined in the *Bats and Bat Habitats: Guidelines for Wind Power Projects* (2011). Specifically, acoustic monitoring stations (broadband bat detectors) will be set-up within the FOM community located adjacent to the project location. The surveys will begin at dusk and last for 5 hours for 10 nights during the month of June. Surveys will be weather permitting and should occur on mild nights ($> 10^{\circ}\text{C}$) with low winds ($< 6\text{ m/s}$) and no precipitation. The results of these surveys will be carried out by an experience bat biologist. Species abundance and richness determined during the post-construction monitoring will be compared to pre-construction surveys which will also include cavity/snag tree exit surveys (as outlined in the above section).

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Survey Points for Pre-construction Surveys and Post-construction Monitoring



Legend

- ◆ Crepuscular Bird Survey Point
- ◆ Breeding Bird Survey Point (Pre and Post-construction)
- ◆ Breeding Bird Survey Point (Pre-construction)
- ▲ Reptile Survey Point
- Candidate Tree for Bat Exit Survey
- Bat Acoustic Survey (Post-construction)
- Amphibian Breeding Survey Point (Pre and Post-construction)
- Amphibian Breeding Survey Point (Pre-construction)
- Expressway / Highway
- Arterial Road
- Collector Road
- Local Road
- Potential Stream
- × — × Fence Line
- ▭ Project Location
- ▭ Amended Project Location
- - - 120 m Project Location Setback
- - - 300 m Project Location Setback
- - - 120 m Amended Project Location Setback
- - - 300 m Amended Project Location Setback
- Dug Farm Pond
- Bat Maternity Colony (BMC)
- Marsh Breeding Bird Habitat (MBB)
- Waterfowl Stopover and Staging Area (Aquatic) (WSSA)
- Reptile Hibernaculum (SH)
- Waterfowl Nesting Area (WNA)
- Amphibian Breeding Habitat (Woodland) (ABF)

*Identifiers in parentheses refer to the original AMEC prepared NHA reports (June 2012)

