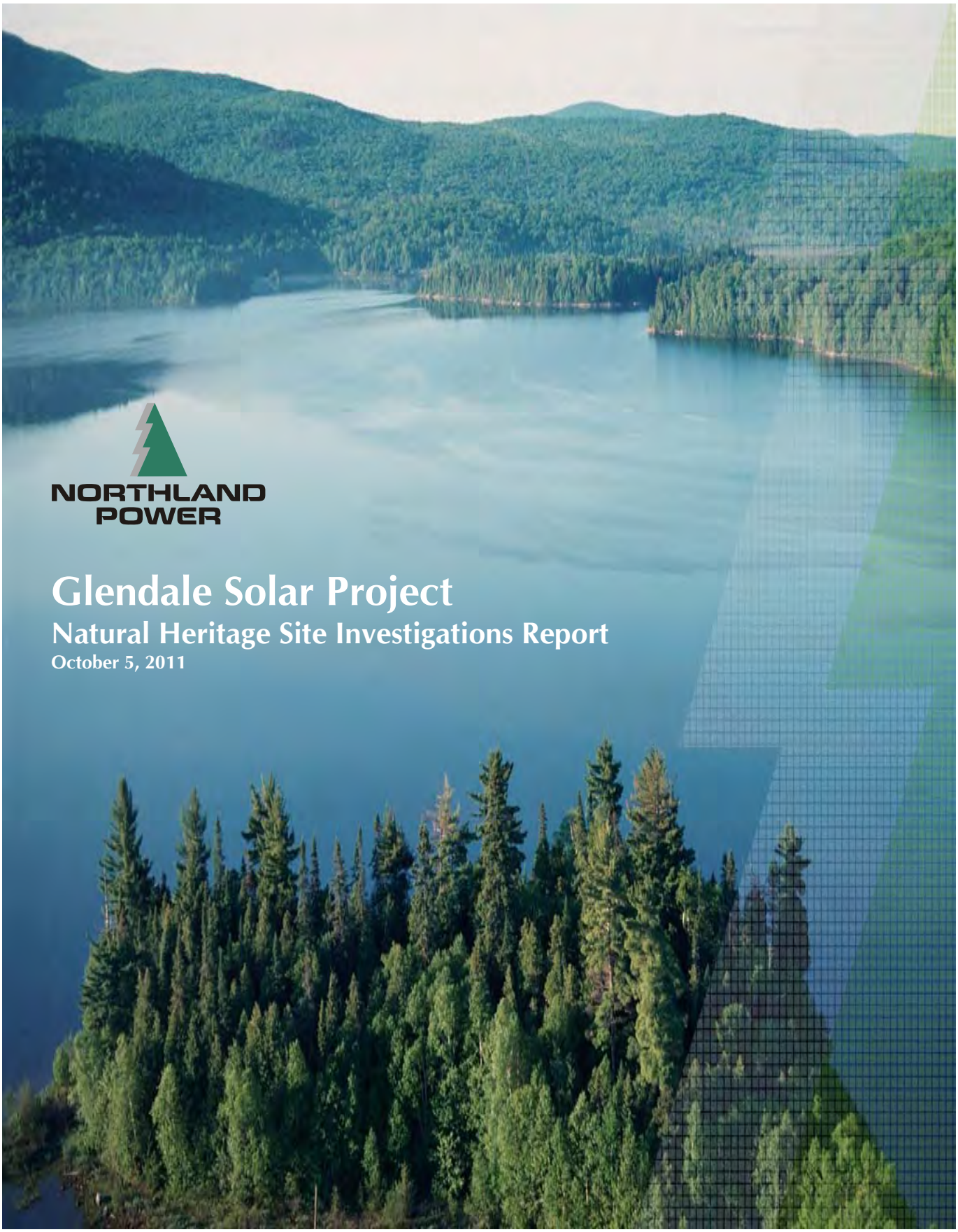

NORTHLAND POWER

Glendale Solar Project

Natural Heritage Site Investigations Report

October 5, 2011

Northland Power Inc.
on behalf of
Northland Power Solar
Glendale L.P.
Toronto, Ontario

Natural Heritage Site Investigation Report

Glendale Solar Project

H334844-0000-07-124-0205
Rev. 1
October 5, 2011

Project Report

October 5, 2011

Northland Power Inc.
Glendale Solar Project

Natural Heritage Site Investigation Report

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1. Introduction

1.1 Project Description

Northland Power Solar Glendale L.P. (hereinafter referred to as "Northland") is proposing to develop a 10-MW solar photovoltaic project titled the Glendale Solar Project (hereinafter referred to as the "Project"). The Project will be located on approximately 45 hectares (ha) of land, in the Township of South Glengarry, within the United Counties of Stormont, Dundas and Glengarry (Figure 1.1).

1.2 Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, (herein referred to as the REA Regulation) made under the *Environmental Protection Act* identifies the Renewable Energy Approval (REA) requirements for renewable energy projects in Ontario. Section 4 of the REA Regulation, ground mounted solar facilities with a name plate capacity greater than 10 kilowatts (kW) are classified as Class 3 solar facilities and do require a REA.

Section 26 of the REA Regulation requires proponents of Class 3 solar projects to undertake a natural heritage site investigation for the purpose of determining

a) whether the results of the analysis summarized in the Natural Heritage Records Review report prepared under subsection 25 (3) are correct or require correction, and identifying any required corrections

b) whether any additional natural features exist, other than those that were identified in the Natural Heritage Records Review report prepared under subsection 25 (3)

c) the boundaries, located within 120 m of the project location, of any natural feature that was identified in the records review or the site investigation

d) the distance from the project location to the boundaries determined under clause (c).

Natural Features are defined in Section 1.1 of the REA Regulation to be all or part of

a) an area of natural and scientific interest (ANSI) (earth science)

b) an ANSI (life science)

c) a coastal wetland

d) a northern wetland

e) a southern wetland

f) a valleyland

g) a wildlife habitat, or

h) a woodland.

Subsection 3 of Section 26 of the REA Regulation requires the proponent to prepare a report setting out the following:

1. A summary of any corrections to the report prepared under subsection 25 (3) and the determinations made as a result of conducting the site investigations under subsection (1).
2. Information relating to each natural feature identified in the records review and in the site investigations, including the type, attributes, composition and function of the feature.
3. A map showing,
   i. the boundaries mentioned in clause (1) (c)
   ii. the location and type of each natural feature identified in relation to the project location
   iii. the distance mentioned in clause (1) (d).
4. The dates and times of the beginning and completion of the site investigation.
5. The duration of the site investigation.
6. The weather conditions during the site investigation.
7. A summary of methods used to make observations for the purposes of the site investigation.
8. The name and qualifications of any person conducting the site investigation.
9. Field notes kept by the person conducting the site investigation.

This Natural Heritage Site Investigation Report has been prepared to meet these requirements.

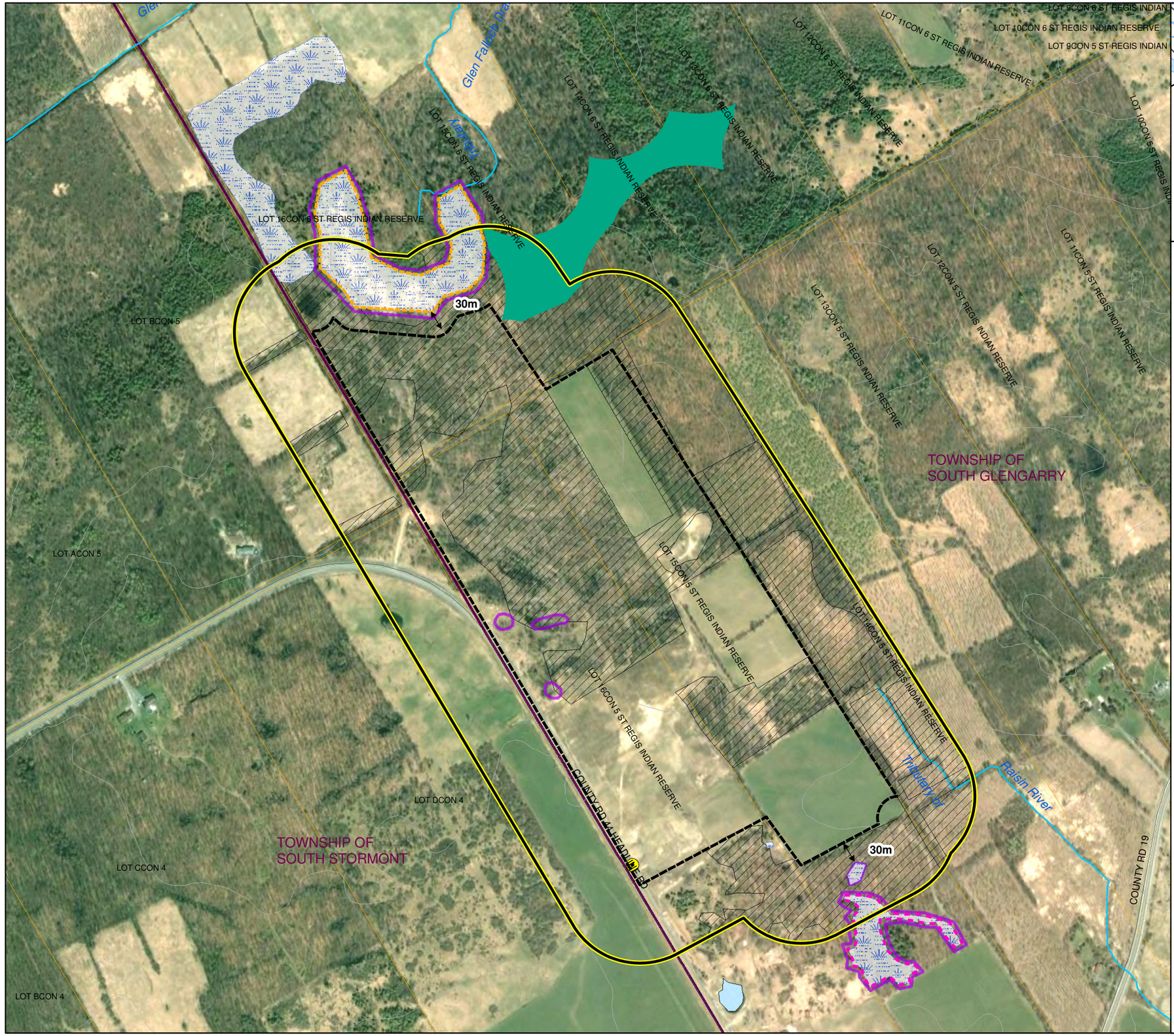
2. Summary of Results of Records Review

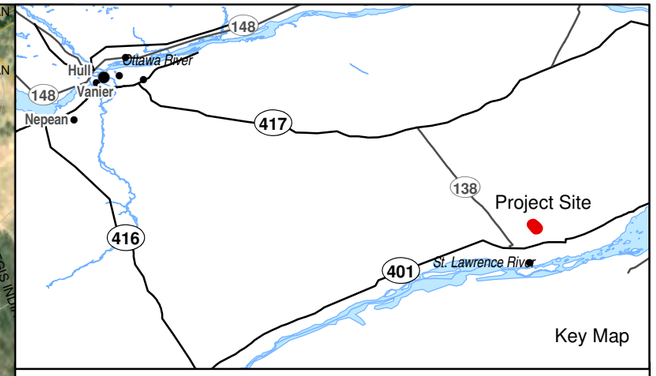
Table 2.1 summarizes the results of the records review (Hatch, 2010).

Table 2.1 Summary of Records Review Determinations

Determination to be Made	Yes/No	Description
Is the Project in a natural feature?	Yes	There are woodlands identified on the Project location.
Is the Project within 50 m of an ANSI (earth science)?	No	The nearest earth science ANSI is located several kilometres from the Project location.
Is the Project within 120 m of a natural feature that is not an ANSI (earth science)?	Yes	There are woodlands identified within 120 m of the Project location.

Therefore, based on the Records Review, Project components will be located in or within 120 m of a woodland.





Legend

- Roads
- Watercourse
- Parcels
- Municipal Boundary
- Waterbody

Candidate Significant Natural Features

- Amphibian Breeding Habitat
- Forest Providing a High Diversity of Habitats/ Ovenbird Habitat / American Redstart Habitat / Eastern Wood-Pewee Habitat / Northern Flicker Habitat
- Interior Forest
- Milksnake Habitat / Highly Diverse Areas / Raptor Winter Feeding and Roosting Habitat
- Waterfowl Nesting Area
- Western Chorus Frog Habitat
- Wetland
- Woodland

Project Components

- 120 m from Project Location
- Project Location
- Connection Point With Existing Distribution Line

0 75 150 300 Metres

1:6,000

NORTH

Notes:
1. OBM and NRVIS data downloaded from LIO,with permission.
2. Spatial referencing UTM NAD 83, August 2010.
3. Satellite imagery from Google Earth Pro.

Figure 1.1
Northland Power Inc.
Glendale Solar Project
Project Components and Natural Heritage Features

HATCH

P:\\NiaDATA2\Projects\NORTHLAND\333751\DATABASES\334844\GIS\Glendale\Glendale_landinvestigation1.mxd Last updated Wednesday, July 06, 2011

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3. Site Investigation Methodology

Several site investigations were conducted on the project property. The site visits are described below.

3.1 Hatch Site Visits

3.1.1 Site Investigation 1

3.1.1.1 Date, Time, and Duration of Site Investigation

- Date: June 21, 2010
- Start Time: 1930
- Duration: approximately 0.5 hours

3.1.1.2 Weather Conditions During Site Investigation

- Temperature: 18ºC
- Beaufort Wind: 1
- Cloud Cover: 30%

3.1.2 Site Investigation 2

3.1.2.1 Date, Time, and Duration of Site Investigation

- Date: June 22, 2010
- Start Time: 0830
- Duration: approximately 11 hours

3.1.2.2 Weather Conditions During Site Investigation

- Temperature: 22ºC
- Beaufort Wind: 1
- Cloud Cover: 50%

3.1.3 Site Investigation 3

3.1.3.1 Date, Time, and Duration of Site Investigation

- Date: September 24, 2010
- Start Time: 1000
- Duration: 8.5 hours

3.1.3.2 Weather Conditions During Site Investigation

- Temperature: 15ºC
- Beaufort Wind: 3

- Cloud Cover: 30%

3.1.4 Site Investigation 4

3.1.4.1 Date, Time, and Duration of Site Investigation

- Date: September 25, 2010
- Start Time: 0900
- Duration: 10 hours

3.1.4.2 Weather Conditions During Site Investigation

- Temperature: 14ºC
- Beaufort Wind: 4
- Cloud Cover: 100%

3.1.5 Site Investigation 5

3.1.5.1 Date, Time, and Duration of Site Investigation

- Date: September 26, 2010
- Start Time: 0900
- Duration: 10 hours

3.1.5.2 Weather Conditions During Site Investigation

- Temperature: 11ºC
- Beaufort Wind: 2
- Cloud Cover: 100%

3.1.6 Site Investigation 6

3.1.6.1 Date, Time, and Duration of Site Investigation

- Date: September 27, 2010
- Start Time: 0800
- Duration: 9 hours

3.1.6.2 Weather Conditions During Site Investigation

- Temperature: 13ºC
- Beaufort Wind: 1
- Cloud Cover: 100%

3.1.7 Site Investigation 7

- Date: June 2, 2011

- Start Time: 15:30 hours
- End Time: 17:30 hours
- Duration: 2 hours

3.1.8 Weather Conditions during Site Investigation

- Temperature: 19°C
- Beaufort Wind: 4

3.1.9 Name and Qualifications of Person Conducting Site Investigation

All site investigations were completed by Martine Esraelian. Paul Ashley was involved in the site investigation completed on June 2, 2011.

Martine Esraelian, B.Sc. is an Environmental Scientist specializing in species at risk and terrestrial ecosystems. She has a B.Sc. from Trent University where she specialized in Conservation Biology and Ecological Management and an Ecosystem Management Technician diploma from Sir Sandford Fleming College. During her time at Trent University, she completed a 1-yr internship with the MNR which involved developing a genetic-based protocol for the extraction of DNA from unknown turtle eggshells to assist with species identification. The project entailed extensive molecular genetics research and intensive lab work to develop a protocol able to supplement existing conservation management practices.

She offers expertise across the full breadth of the field from environmental assessments and technical analysis of environmental data to conservation management, corporate and government consulting, and community outreach. Martine has liaised with all levels of government, the community, and a portfolio of clients that includes consulting firms, planners, and high-profile developers. She has both technical and hands-on experience conducting site investigations (terrestrial and aquatic), evaluations of significance, environmental and agricultural impact studies, constraint analyses, water quality and soil assessments, species at risk, wildlife management and fisheries studies to meet regulatory requirements.

Martine has a wide range of field experience related to terrestrial and aquatic ecosystems and species at risk. She has conducted reptile and amphibian surveys, small-mammal trapping, benthic invertebrate monitoring and fisheries inventories (seine netting and electrofishing). She has conducted detailed natural areas inventories which involve species identification of flora and fauna, vegetation community mapping, identifying rare vegetation communities and significant wildlife habitats.

Martine has project management and fieldwork experience for a number of species at risk monitoring projects. Some of the species she has been involved with include: fowler's toad, eastern massasauga rattlesnake, eastern ratsnake, queensnake, eastern ribbonsnake, milksnake, blanding's turtle, map turtle, spotted turtle, snapping turtle, Jefferson salamander, northern dusky and mountain alleghany dusky salamander, butternut, flowering dogwood, swamp rose mallow and spoon-leaved moss.

Martine is a certified Butternut Health Assessor and also holds a certificate in the Ecological Land Classification (ELC) system.

Paul Ashley, MSc., is a senior ecologist with Hatch Ltd. Paul has wide-ranging experience working in terrestrial and wetland landscapes. He has led many management and rehabilitation projects related to forests, savannahs, wetlands and riparian corridors. While doing so he has worked with representatives from all tiers of government, non government organizations, universities and the private sector. Paul joined Hatch Ltd in 2010 and is actively involved in the Renewable Energy Approval process.

3.1.10 Survey Methods

The entire site was searched by the observer on foot in order to document natural features. Photographs of the site were taken. Any observations of wildlife, vegetation, or natural features were noted.

Vegetation communities were generally described according to the Ecological Land Classification.

A copy of the field notes kept by the observer is provided in Appendix A.

3.2 Natural Resource Solutions Inc. Site Investigation

Natural Resource Solutions Inc. (NRSI) conducted a site investigation in order to determine boundaries and evaluate significance of wetland communities. Names, qualifications and survey methodologies are identified within their report provided in Appendix B.

3.2.1 Date, Time, and Duration of Site Investigation

- Date: August 12, 2010
- Start Time: 08:38 hours
- Duration: 8 hours

3.2.2 Weather Conditions During Site Investigation

- Temperature: 18
- Beaufort Wind: 3
- Cloud Cover: 60%

3.3 Ministry of Natural Resources/Hatch Site Visit

This site visit was conducted in order to confirm the boundaries of the wetland communities identified by during earlier site visits. S. Thompson, District Ecologist (MNR Kemptville District) led the site investigation. Others in attendance included P. Ashley and M. Esraelian (Hatch) and H. Zurbrigg (MNR Kemptville District).

Field notes from this site investigation were kept by MNR.

3.3.1 Date, Time and Duration of Site Investigation

- Date: June 2, 2011
- Start Time: 13:00 hours
- End Time: 15:30 hours

- Duration: 2.5 hours

3.3.2 Weather Conditions during Site Investigation

- Temperature: 16°C
- Beaufort Wind: 4

4. Results of Site Investigation

Portions of the Project location are comprised of active agricultural lands used for the production of hay or corn. A photograph of these areas of the Project location is provided in Figure 4.1.

Figure 4.1 View of the South Portion of the Project Location

The areas that are not in agricultural production are comprised of natural features such as woodlands, wetlands and cultural vegetation communities (i.e., hedgerows). A discussion of these natural features, including vegetation communities and wildlife species observed on the Project location are described in detail below.

4.1 Vegetation Observations

The natural features identified on and in the vicinity of the Project location are generally described following the Ecological Land Classification (ELC) System, and where possible at the community series, ecosite and type levels. Cultural and natural vegetation communities have been identified on and within the vicinity of the Project location and include plantations, woodlands and wetlands. The vegetation species observed on and in the vicinity of the Project location are listed in Table 4.1.

MNR records identified three vegetation species of conservation concern with potential for occurrence on the Project location. These species are addressed separately below:

- Brainerd's Hawthorn (*Crataegus brainerdii*)/Caughuawaga Hawthorn (*Craetagus suborbiculata*) – Several hawthorns were identified during the site investigation. Hawthorns were identified to the species level based on floristic indicators. These hawthorn species of conservation concern were not identified during the site investigation.
- Halbered-leaved Tearthumb (*Polygonum arifolium*) – Suitable habitat for Halbered-leaved Tearthumb is found on the Project location within the low-lying woodland communities as this species is an associate of marsh and swamplands, particularly tidal marshes. Suitable areas of habitat were searched via area searches. All site investigations were completed during the known flowering period for Halbered-leaved Tearthumb. Halbered-leaved Tearthumb were not identified during the site investigations. Though this species is a relatively small herbaceous species (generally 15 to 150 cm in length), it is a relatively distinct species that would have been readily identifiable were it noted as present. Therefore, based on the absence of observations during any site investigation, it is determined that this species does not presently occur on or within 120 m of the Project location.

Table 4.1 Vascular Plant Species Observed on the Project Location

Type	Scientific Name	Common Names	Global (GRank)	Provincial (SRank)
Tree	*Acer rubrum*	Red Maple	G5	S5
Tree	*Acer saccharinum*	Silver Maple	G5	S5
Tree	*Acer saccharum ssp. saccharum*	Sugar Maple	G5T5	S5
Tree	*Betula papyrifera*	White Birch	G5	S5
Tree	*Carya cordiformis*	Bitternut Hickory	G5	S5
Tree	*Carya ovata*	Shagbark Hickory	G5	S5
Tree	*Fagus grandifolia*	American Beech	G5	S4
Tree	*Fraxinus americana*	White Ash	G5	S5
Tree	*Fraxinus nigra*	Black Ash	G5	S5
Tree	*Fraxinus pennsylvanica*	Green Ash / Red Ash	G5	S5
Tree	*Ostrya virginiana*	Ironwood	G5	S5
Tree	*Picea glauca*	White Spruce	G5	S5
Tree	*Populus balsamifera*	Balsam Poplar	G5	S5
Tree	*Populus tremuloides*	Trembling Aspen	G5	S5
Tree	*Prunus serotina*	Black Cherry	G5	S5
Tree	*Quercus macrocarpa*	Bur Oak	G5	S5
Tree	*Tilia americana*	Basswood	G5	S5

Type	Scientific Name	Common Names	Global (GRank)	Provincial (SRank)
Tree	*Ulmus americana*	White Elm	G5?	S5
Tree	*Ulmus thomasii*	Rock Elm	G5	S4?
Shrub	*Cornus stolonifera*	Red-osier Dogwood	G5	S5
Shrub	*Malus pumila*	Common Apple	G5	SNA
Shrub	*Potentilla fruticosa ssp. floribunda*	Shrubby Cinquefoil	G5T5	S5
Shrub	*Rhamnus cathartica*	Common Buckthorn	GNR	SNA
Shrub	*Rhus typhina*	Staghorn Sumac	G5	S5
Shrub	*Ribes cynosbati*	Prickly Gooseberry	G5	S5
Shrub	*Rubus odoratus*	Purple Flowering Raspberry	G5	S5
Shrub	*Sambucus canadensis*	Common Elderberry	G5T5	S5
Shrub	*Spiraea alba*	Narrow-leaved Meadowsweet	G5	S5
Shrub	*Zanthoxylum americanum*	Prickly-ash	G5	S5
Shrub	*Cornus sp*	Dogwood Species		
Shrub	*Crataegus sp*	Hawthorn Species		
Shrub	*Rubus sp*	Rubus Species		
Shrub	*Salix sp*	Willow Species		
Herb	*Typha latifolia*	Broad-leaved Cattail	G5	S5
Herb	*Anemone acutiloba*	Sharp-lobed Hepatica	G5	S5
Herb	*Aralia nudicaulis*	Wild Sarsaparilla	G5	S5
Herb	*Arctium minus ssp. minus*	Common Burdock	GNRTNR	SNA
Herb	*Asclepias incarnata ssp. incarnata*	Swamp Milkweed	G5	S5
Herb	*Asclepias syriaca*	Common Milkweed	G5	S5
Herb	*Aster macrophyllus*	Large-leaved Aster	G5	S5
Herb	*Caulophyllum thalictroides*	Blue Cohosh	G5	S5
Herb	*Chrysanthemum leucanthemum*	Ox-eye Daisy	GNR	SNA
Herb	*Epipactis helleborine*	Helleborine	GNR	SNA
Herb	*Erigeron annuus*	Daisy Fleabane	G5	S5
Herb	*Fragaria virginiana ssp. virginiana*	Common Strawberry	G5	S5
Herb	*Galium triflorum*	Fragrant Bedstraw	G5	S5
Herb	*Galium trifidum*	Small Bedstraw	G5	S5
Herb	*Geranium maculatum*	Wild Geranium	G5	S5
Herb	*Lotus corniculatus*	Bird's-foot Trefoil	GNR	SNA
Herb	*Maianthemum canadense*	Canada Mayflower	G5	S5
Herb	*Maianthemum racemosum*	False Solomon's Seal	G5	S5
Herb	*Medicago lupulina*	Black Medick	GNR	SNA
Herb	*Pastinaca sativa*	Wild Parsnip	G4G5	S5
Herb	*Penstemon digitalis*	Foxglove Beard-tongue	G5	S4S5
Herb	*Podophyllum peltatum*	Mayapple	G5	S5
Herb	*Potentilla recta*	Rough-fruited Cinquefoil	GNR	SNA
Herb	*Prenanthes alba*	White Lettuce	G5	S5
Herb	*Ranunculus acris*	Tall Buttercup	G5	SNA

Type	Scientific Name	Common Names	Global (GRank)	Provincial (SRank)
Herb	*Rudbeckia hirta*	Black-eyed Susan	G5	S5
Herb	*Sanguinaria canadensis*	Bloodroot	G5	S5
Herb	*Sonchus oleraceus*	Common Sow-thistle	GNR	SNA
Herb	*Streptopus roseus*	Rose Twisted Stalk	G5	S5
Herb	*Trifolium pratense*	Red Clover	GNR	SNA
Herb	*Trifolium repens*	White Clover	GNR	SNA
Herb	*Trillium sp*	Trillium Species		
Herb	*Typha angustifolia*	Narrow-leaved Cattail	G5	SNA
Herb	*Typha latifolia*	Broad-leaf Cattail	G5	S5
Herb	*Verbascum thapsus*	Common Mullein	GNR	SNA
Herb	*Viola canadensis*	Canada Violet	G5	S5
Herb	*Aster sp*	Aster Species		
Herb	*Solidago sp*	Goldenrod Species		
Herb	*Taraxacum sp*	Dandelion Species		
Herb	*Viola sp*	Violet Species		
Vine	*Vicia cracca*	Cow Vetch	GNR	SNA
Woody Vine	*Parthenocissus quinquefolia*	Virginia Creeper	G5	S4?
Woody Vine	*Solanum dulcamara*	Bittersweet Nightshade	GNR	SNA
Woody Vine	*Vitis riparia*	Riverbank Grape	G5	S5
Graminoid	*Phalaris arundinacea*	Reed Canary Grass	G5	S5
Graminoid	Poaceae Family	Grass Species		
Sedge	*Carex lasiocarpa*	Slender Sedge	G5	S5
Sedge	*Carex lupulina*	Common Hop Sedge	G5	S5
Sedge	*Carex stipata*	Awl-fruited Sedge	G5	S5
Sedge	*Carex viridula*	Greenish Sedge	G5	S5
Sedge	*Carex vulpinoidea*	Fox Sedge	G5	S5
Sedge	*Eleocharis sp*	Spike-rush Species		
Sedge	*Scirpus microcarpus*	Small-fruited Bulrush	G5	S5
Sedge	*Scirpus validus*	Softstem Bulrush	G?	S5
Sedge	Cyperaceae Family	Sedge Species		
Fern	*Deparia acrostichoides*	Silvery Spleenwort	G5	S4
Fern	*Onoclea sensibilis*	Sensitive Fern	G5	S5
Fern	*Polystichum acrostichoides*	Christmas Fern	G5	S5
Fern	Dryopteridaceae Family	Fern Species		

Acronyms/Definitions

Global

G5 – **Very common** (demonstrably secure under present conditions)
GNR - Denotes that the species does not have a Global Ranking
T – Denotes that the rank applies to a subspecies or variety.

Provincial

S5 – **Secure** (Common, widespread, and abundant in the nation or state/province)
S4 – **Apparently Secure** (Uncommon but not rare; some cause for long-term concern due to declines or other factors)
SNA – **Not Applicable** (A conservation status rank is not applicable because the species is not a suitable target for conservation activities)
NAR – Not at Risk

4.1.1 Cultural Vegetation Communities

Cultural vegetation communities are described in the ELC system as areas formed as a result of anthropogenic and cultural disturbances. These communities are typically dominated by non-native species. The following cultural communities, although not formally classified in the ELC system, are considered culturally influenced and therefore are included in this category.

Cultural Hedgerows (CUH)

Cultural hedgerow communities are described as linear corridors dominated by shrub and tree species and are common in rural landscapes. These communities are often found along property lines, roadsides and within agricultural fields to separate one piece of land from another. Hedgerow communities not only serve a purpose for farmers (e.g., shelterbelts), but provide wildlife habitat for a variety of species.

There is one hedgerow community located on the Project location, within the southeast portion of the Project location. The tree species observed included rock elm and bur oak. The locations of the hedgerow community are shown in Figure 1.1.

4.1.2 Woodland Communities

The woodlands located on and within 120 m of the Project location were determined to be contiguous (see Figure 1.1 for new boundaries). This represents a change in the boundary of the woodlands from those identified in the records review.

The woodlands were characterized in the ELC system as deciduous forest communities (FOD). The woodland is discussed in relation to various portions of the community.

On and near the southeastern corner of the Project location, the woodland is described as a young to mid-aged forest, dominated by deciduous tree species. The tree species observed within this portion of the woodland include ironwood, American beech, and sugar maple as the dominant species, with green ash, black ash, bur oak, rock elm, white elm, and basswood associates. The shrub species observed included common elderberry, prickly gooseberry, purple flowering raspberry, prickly-ash, dogwood sp., raspberry sp., and hawthorn species. Groundcover vegetation included tall buttercup, ox-eye daisy, common strawberry, Virginia creeper, riverbank grape, bittersweet nightshade, fragrant bedstraw, common burdock, black medick, goldenrod sp., aster sp., grass sp., and sedge species. A photograph of this woodland is provided in Figure 4.2.

Figure 4.2 View of the Woodland Located Along the Southeast Boundary of the Project Location

The woodland on and within 120 m of the northern half of the Project location is described as a mid-aged deciduous forest. The tree species observed included trembling aspen, American beech, sugar maple, red maple, ironwood, bitternut hickory, shagbark hickory, American elm, white ash, green ash, bur oak and basswood. Shrubs such as common apple, staghorn sumac, prickly-ash, common buckthorn, purple flowering raspberry and prickly gooseberry were observed. Groundcover vegetation within closed canopy areas included blue cohosh, red baneberry, bloodroot, false solomon's seal, wild sarsaparilla, Canada violet, rose-twisted stalk, round lobed hepatica, helleborine, large-leaved aster, fragrant bedstraw, Canada mayflower, mayapple, trillium sp., and fern species. In areas of open canopy, the dominant groundcover vegetation within the woodlands and open field meadows included a mix of grasses, herbs and vines such as ox-eye daisy, cow vetch, red clover, white clover, bird's foot trefoil, black-eyed susan, riverbank grape, Virginia creeper, goldenrod sp., nettle sp., and aster species. There were several large boulders and leaf litter was abundant. Several area of open water were noted within the woodland community, however during the MNR led site investigation it was determined that these areas did not meet the definition of a wetland as prescribed in the Ontario Wetland Evaluation System. This woodland community is fairly disturbed, with regular tree removal noted and several regularly used trails established through the woodland community.

Figure 4.3 View of the Woodland Community Along the Northeast Boundary of the Project Location

Within 120 m of the northwestern corner of the Project location, near the unopened road allowance which occurs on the Boundary of the Townships of South Glengarry and South Stormont, the woodland is patchy, with open areas prevalent. Open areas are often related to the presence of large trails maintained by the landowner for the purpose of accessing the back portion of this property for hunting/logging. In addition to the network of trails found within this area, other evidence of disturbance is prevalent in this area including dead and diseased trees, high abundance of non-native species, and piles of waste (see Figure 4.4.).

Figure 4.4 View of a Typical Waste Pile Present within 120 m of the Project Location

4.1.3 Wetland Communities

There are two unevaluated wetland communities that were identified within 120 m of the Project location during the time of the site investigations. The first of these communities, located within 120 m north of the Project location is comprised of a reed-canary grass meadow marsh community (see Figure 4.5), while the second located within 120 m south of the Project location is comprised of a mixedwood swamp community (see Figure 4.6).

Figure 4.5 View of a Meadow Marsh Community within 120 m of the Project Location

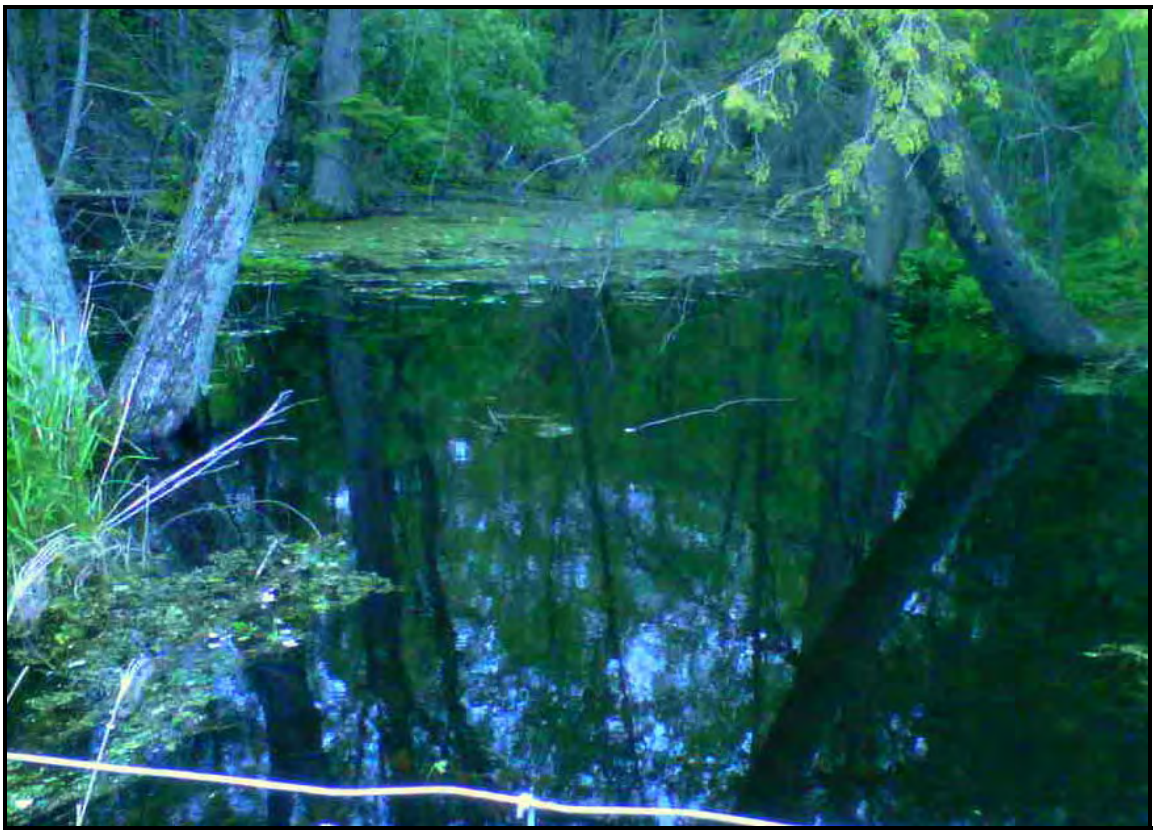

Figure 4.6 View of the Mixedwood Swamp Community within 120 m of the Project Location

4.2 Wildlife Observations

The following table provides a list of wildlife species that were observed on the Project location during the time of the site investigations.

Table 4.2 List of Wildlife Species Observed on the Project Location During the Site Investigations

Common Name	Scientific Name	Rank		Area-Sensitive Species	Declining Species
		Global (GRank)	Provincial (SRank)		
Mammals					
Eastern Chipmunk	*Tamias striatus*	G5	S5	-	-
Coyote	*Canis latrans*	G5	S5	-	-
White-tailed Deer	*Odocoileus virginianus*	G5	S5	-	-
Birds					
Canada Goose	*Branta candensis*	G5	S5	-	-
Wood Duck	*Aix sponsa*	G5	S5	-	-
Red-tailed	*Buteo jamaicensis*	G5	S5	-	-

Common Name	Scientific Name	Rank		Area-Sensitive Species	Declining Species
		Global (GRank)	Provincial (SRank)		
Hawk					
Great Blue Heron	*Ardea herodius*	G5	S5B	-	-
Wild Turkey	*Meleagris gallopavo*	G5	S5	-	-
American Crow	*Corvus brachyrhynchos*	G5	S5B	-	-
Blue Jay	*Cyanocitta cristata*	G5	S5	-	-
Northern Flicker	*Colaptes auratus*	G5	S4B	-	Yes
Ruby-throated Hummingbird	*Archilochus colubris*	G5	S5B	-	-
American Robin	*Turdus migratorius*	G5	S5B	-	-
Cedar Waxwing	*Bombycilla cedrorum*	G5	S5B	-	-
Black-capped Chickadee	*Poecile atricapillus*	G5	S5	-	-
Easter Wood-Pewee	*Contopus virens*	G5	S4B	-	Yes
Cuckoo sp.	*Coccyzus sp.*	-	-	-	-
Common Yellowthroat	*Geothlypis trichas*	G5	S5B	-	-
American Redstart	*Setophaga ruticilla*	G5	S5B	Yes	-
Ovenbird	*Seiurus auracapilla*	G5	S4B	Yes	-
American Goldfinch	*Carduelis tristis*	G5	S5B	-	-
Common Grackle	*Quiscalis quiscula*	G5	S5	-	-
European Starling	*Sturnus vulgaris*	G5	SNA	-	-
White-throated Sparrow	*Zonotrichia albicollis*	G5	S5B	-	-
Amphibians					
Gray Treefrog	*Hyla versicolor*	G5	S5	-	-
Wood Frog	*Rana sylvatica*	G5	S5	-	-
Green Frog	*Rana clamitans*	G5	S5	-	-
Reptiles					
Gartersnake	*Thamnophis sirtalis*	G5	S5	-	-
Insects					
Cherry-faced Meadowhawk	*Sympetrum internum*	G5	S5	-	-
White-faced Meadowhawk	*Sympetrum obtrusum*	G5	S5	-	-
White Admiral	*Limenitis arthemis*	G5	S5	-	-
Viceroy	*Limenitis archippus*	G5	S5	-	-
Monarch	*Danaus plexippus*	G5	S2N,S4B	-	-

Common Name	Scientific Name	Rank		Area-Sensitive Species	Declining Species
		Global (GRank)	Provincial (SRank)		
Fragile Forktail	*Ischnura posita*	G5	S4	-	-
Cabbage White	*Pieris rapae*	G5	SNA	-	-

Acronyms/Definitions
Global
G5 – **Very common** (demonstrably secure under present conditions)
T – Denotes that the rank applies to a subspecies or variety.
Provincial
S5 – **Secure** (Common, widespread, and abundant in the nation or state/province)
S4 – **Apparently Secure** (Uncommon but not rare; some cause for long-term concern due to declines or other factors)
S2 - **Imperilled (**Imperiled because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation)
N - Non-breeding
B - Breeding
SNA – **Not Applicable** (A conservation status rank is not applicable because the species is not a suitable target for conservation activities)
NAR – Not at Risk

4.2.1 Wildlife Habitat

The Significant Wildlife Habitat Technical Guide (SWHTG) (MNR, 2000) identifies four main types of wildlife habitat that can be classified as significant:

- habitat for seasonal concentrations of animals
- rare or specialized habitats for wildlife
- habitat for species of conservation concern
- wildlife movement corridors.

Each of these types of wildlife habitat is considered further below and how they were considered during the site investigations.

4.2.1.1 Habitats of Seasonal Concentrations

There are many different kinds of seasonal concentration areas, with the likelihood of occurrence of one of these areas depending on the characteristics of the study location. Those that were considered during the site investigations, and the discussion of their potential occurrence on the Project location, are discussed below.

- Winter deer yards – Winter deer yards are sheltered areas where white-tailed deer congregate during the winter months. As white-tailed deer are not adept at moving through deep snow, a key component of a winter deer yard is a core area predominantly composed of coniferous trees with a 60% canopy cover. Habitat of this type within 120 m of the Project location was considered during the site investigations in relation to the wooded areas on and within 120 m of the Project location. A coniferous component was noted associated with the swamp community within 120 m south of the Project location, however the woodland is predominantly deciduous and there would therefore be little canopy cover to support a winter deer yard.

- Moose late winter habitat – The study area is outside of the range of persistent moose population, and therefore this habitat type cannot be found on or within 120 m of the Project location.
- Colonial bird nesting sites – Colonial bird nesting sites are locations where colonial species, such as herons, gulls, terns, and swallows traditionally nest in colonies of varying size. Colonial birds were not recorded during the site investigation. Though a deciduous swamp was noted within 120 m of the Project location, no heronry, which are an obvious and distinctive feature, were observed within the wetland community. Areas of marshland that would provide suitable habitat for Black Tern were not noted within the wetland communities given that there were few areas of open water identified within the wetland communities indicating that they do not provide habitat characteristics capable of supporting Black Tern colonies. Given the absence of major watercourses on or within 120 m of the Project location, and therefore there are no suitable rocky areas and peninsulas that would provide gull and tern breeding colony locations. Finally, exposed earth embankments, rock faces, or other such similar features that would provide potential swallow colonial breeding locations were not found on or within 120 m of the Project location. As a result, colonial bird nesting sites are not identified on or within 120 m of the Project location.
- Waterfowl stopover and staging areas – Waterfowl traditionally congregate in larger wetlands or complexes of smaller wetlands, and relatively undisturbed shorelines with vegetation during spring and fall migration. Further, during the fall migration, waterfowl may commonly congregate in feeding or roosting ponds. No large wetlands or relatively undisturbed shorelines with vegetation were identified on or within 120 m of the Project location. Similarly, though there are two small wetlands identified within 120 m of the Project location that are part of a much larger wetland complex, the wetlands within 120 m of the Project location were determined to not provide sufficient open water to support large numbers of migrant waterfowl.
- Waterfowl nesting – Waterfowl nesting sites can consist of relatively large, undisturbed upland areas with abundant ponds and wetlands, while other species nest within tree cavities in swamps or on the shorelines of waterbodies. There are no upland areas present adjacent to the meadow marsh wetland community present within 120 m of the Project location. The wetland community within 120 m south of the Project location does meet the criteria for waterfowl nesting habitat, and wood ducks were observed within this feature. Therefore, waterfowl nesting is carried forward to the evaluation of significance.
- Shorebird migratory stopover areas – Shorebird migratory stopover areas are found along the shorelines of the Great Lakes and James Bay, as the Project location is located more than 120 m away from these areas, this habitat type cannot occur on the Project location.
- Landbird migratory stopover areas – Landbird stopover areas are found within 5 km of the shorelines of the Great Lakes and contain a variety of habitat types from open fields to large woodlands. As the Project location is located greater than 120 m away from these areas, this habitat type cannot occur on the Project location.
- Raptor winter feeding and roosting areas – This combined habitat type features suitable raptor roosting sites in proximity to winter feeding areas. Woodland and adjacent upland habitats are

present on and within 120 m of the Project location. As suitable habitat is found, these sites will be carried forward to the evaluation of significance.

- Wild turkey winter range – Similar to winter deer yards, wild turkey rely on coniferous forest stands for winter protection. As was previously discussed, though a coniferous component was noted within the woodland within 120 m south of the Project location, the woodland is predominantly deciduous and there would therefore be little canopy cover to support wild turkey winter range .
- Turkey vulture summer roosting areas – Turkey Vulture summer roosting areas traditionally consist of cliff ledges and large snags. No cliff ledges were noted during the site investigations, and there were few large dead or partially dead trees present within the area. Further, there was no evidence of white-washed trees on or within 120 m of the Project location, and Turkey Vultures were not recorded during the site investigation. As a result, this habitat type is not identified on or within 120 m of the Project location.
- Reptile hibernacula – Reptile hibernacula are commonly found in animal burrows and rock crevices. No animal burrows were recorded during the site investigation. Scattered rocks were recorded within the woodlands on the Project location, however as these rocks were not noted in any aggregations, no crevices capable of providing hibernacula functions were noted. A rock pile was noted within the woodland within 120 m south of the Project location, however the rock pile was determined to be too small to provide sufficient protection from winter frost. . Therefore, this habitat type is not identified on or within 120 m of the Project location
- Bat hibernacula – Bat hibernacula are found in caves, abandoned mines, areas with karst topography and deep rock crevices. These features were not identified during the site investigation. Further, there are no records of abandoned mines from on or within 120 m of the Project location. The Project location is at the edge of an area of potential karst habitat, but no confirmed areas of karst are know from the immediate area (Brunton and Dodge, 2008). Further, no evidence of karst features (exposed bedrock) was identified during the site investigation.
- Bullfrog concentration areas – Bullfrog concentration areas are predominantly found in areas of marsh habitat. Suitable marsh habitats contain deep pools that would indicate a potential for bullfrog concentration. The marshland community within 120 m of the northern extent of the Project location was found to contain open water during the wetland site investigation, however open water communities were uncommon and no deep water areas were identified. As a result, bullfrog concentration areas were not observed on or within 120 m of the Project location.
- Migratory butterfly stopover areas – These habitats are found within 5 km of the Great Lakes; as the Project area is located outside of this zone, such habitat features are not found.

Therefore, raptor winter feeding and roosting areas and waterfowl nesting habitat are candidate significant habitats of seasonal concentration of animals identified on or within 120 m of the Project location.

4.2.1.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

Rare vegetation communities include alvars, tall-grass prairies, savannahs, rare forest types, talus slopes, rock barrens, sand barrens and Great Lakes dunes. None of these vegetation communities

were identified during the site investigations. Vegetation communities that were observed during the site investigations have been previously described in Section 4.1; none of these communities are considered to be rare or uncommon within the local or provincial area. Butternuts were observed on the Project location and are discussed further in Section 4.3.

Specialized wildlife habitats include

- areas that support species that have highly specific habitat requirements
- areas with high species and community diversity
- areas that provide habitat that greatly enhances species survival.

There are many habitat types that may meet these definitions; those that were considered during the site investigations as they had the potential to be present in the area, and the discussion of their potential occurrence on the Project location, are addressed below:

- Habitat for area-sensitive species – Appendix C of the SWHTG lists area-sensitive species. Of these species, two, Ovenbird and American Redstart, were recorded during the site investigations. The Redstart was recorded within the woodland community on the Project location, though suitable habitat is present within the larger woodland community. The Ovenbird was observed calling from the woodland south of the Project location, though suitable habitat is also present within the woodlands on the Project location. As a result, habitat for these species is carried forward to the evaluation of significance. None of the other area-sensitive species identified from the Records Review were recorded during area searches of available habitats completed in association with the site investigations.
- Forests providing a high diversity of habitats – Characteristics of forest communities on and within 120 m of the Project location are discussed further below. Based on these characteristics, it is determined that the woodlands provides a high diversity of habitats given that it encompasses the watercourse, a variety of age classes were noted, and several tree species were recorded during the site investigation.
    - Woodland vegetation communities are described as deciduous forest communities. Dominant tree species included include ironwood, beech, maples, ash, and elm. Several shrub species in various portions of the woodland.
    - Woodlands on and within 120 m of the Project location were identified as young to mid-aged.
    - Given the age of the woodland, young to mid-aged, cavity trees were not recorded on or within 120 m of the Project location.
    - The woodland encompasses a watercourse and wetland communities.
    - Evidence of past and present forest management within the woodland was noted..
- Old-growth or mature forest stands – As discussed above, forest communities on and within 120 m of the Project location are described as young to mid-aged forest communities. Further to this point, no characteristics of old growth forests were recorded (i.e., very tall trees, uneven

canopy, abundant fallen logs). Therefore, these communities were not considered to be old-growth or mature forest stands.

- Foraging areas with abundant mast – This habitat type is found within Ecoregion 6E only in relation to foraging areas with abundant mast present on the Bruce Peninsula (EcoDistrict 6E-14). As the Project location is more than 120 m from this area, within EcoDistrict 6E-11 (MNR, 2009). As a result, this habitat type is not found on the Project location.
- Woodlands supporting amphibian breeding ponds – As previously discussed, wetland communities were identified within 120 m of the Project location. In addition, several pools of water were observed within the woodlands on the Project location. At the time of the MNR site investigation in June 2011, numerous tadpoles were observed within these features. Therefore, this habitat type is determined to be a candidate significant wildlife habitat present on and within 120 m of the Project location.
- Turtle nesting habitat – Turtle nesting sites are associated with areas of meadow marsh, shallow marsh, shallow water areas, bogs and fens (MNR, 2009). Such habitats were identified on the Project location, however none of these communities contained either large amounts of open water that would indicate potential for occupancy by turtles, or are connected to a watercourse that would indicate a potential for seasonal occurrences. Further, no soft substrates, such as sand or fine gravel which are preferred nesting surfaces, were identified. As a result, it is determined that turtle nesting habitat was not identified on or within 120 m of the Project location during the site investigation.
- Specialized raptor nesting habitat – A Red-tailed Hawk was observed during the site investigations; however, its behaviour did not indicate the presence of a nearby nest (i.e., no alarm behaviour). Given the absence of mature forest communities on or within 120 m of the Project location, suitable nesting opportunities for raptor species are limited, and nesting locations (stick nests or white-washed trees were observed that would indicate the presence of a raptor nest) were not identified during the site investigations. As a result, this habitat is not identified on or within 120 m of the Project location.
- Mink, otter, marten, and fisher denning sites – Denning sites for these members of the weasel family are not considered to be significant wildlife habitat within Ecoregion 6E, which overlaps the Project location (MNR, 2009).
- Moose calving areas/aquatic feeding areas/mineral licks – Persistent moose populations are not found in this portion of the province, and therefore such habitat features cannot occur.
- Highly diverse areas – The habitats present on and within 120 m of the Project location were considered in respect of diversity. Characteristics of the areas are described further below in relation to highly diverse areas. Based on the presence of rare species, and diversity noted within the woodlands and wetlands, these features are considered to be candidate highly divers areas.
    - Natural community diversity – Woodlands, wetlands, hedgerows and agricultural fields were recorded on and within 120 m of the Project location. As previously noted, the

woodlands were identified as containing high diversity, while marsh and swamp wetland communities were noted.

- Species diversity – Though a complete species inventory of the various communities was not completed, given that many of the communities extend several hundred meters beyond 120 m from the Project location, a relatively diverse list of species was noted within the communities on and within 120 m of the Project location. Table 4.1 provides the list of vegetation species observed, while several wildlife species were also documented during area searches of the Project location and lands within 120 m.
- Presence of rare species – Butternut, a species identified as Threatened within Ontario, was noted during the site investigations. In addition, two species of conservation concern were identified within the woodlands.
- Size of site – The Project location consists of a 45-ha parcel of land, with characteristics typical of those found within the surrounding regional area.

- Cliffs and caves – These features were not identified on or within 120 m of the Project location during the site investigations.
- Seeps and springs – No seeps or springs were identified in the vicinity of the Project location during the site investigations (see Hatch Ltd., 2010b).

Therefore, rare vegetation communities were not identified on or within 120 m of the Project location. However, several specialized habitats for wildlife were identified on and within 120 m of the Project location:

- woodlands supporting amphibian breeding ponds
- forest providing a high diversity of habitats
- highly diverse areas
- American Redstart habitat
- Ovenbird habitat.

4.2.1.3 Habitat of Species of Conservation Concern

Species of conservation concern that were considered during the site investigations include the following:

- American Kestrel/Black-billed Cuckoo/Belted Kingfisher/Eastern Kingbird/Brown Thrasher/Eastern Towhee/Field Sparrow/Vesper Sparrow/Savannah Sparrow/Eastern Meadowlark/Baltimore Oriole – Though suitable habitat exists within 120 m of the Project location, none of these species were observed visually or heard calling/singing during the site investigations. As surveys were conducted during suitable periods for detection, these species are determined to not be present.
- Eastern Wood-Pewee – Eastern Wood-pewee were recorded along the edge of the woodland community near the middle of the Project location. As a result, habitat for this species will be considered during the evaluation of significance.

- Northern Flicker – Northern Flicker were recorded along the edge of the woodland community near County Road 44. As a result, habitat for this species will be considered during the evaluation of significance.
- Bank Swallow – Suitable nesting habitat (banks along shorelines and in artificial sites such as sand and gravel pits) were not observed on or within 120 m of the Project location.
- Canada Warbler – Suitable habitat for Canada Warbler (wet, mixedwood forest with a well-developed shrub layer, predominantly occurring on the Canadian Shield in eastern Ontario) were not recorded during the site investigation. Further, Canada Warblers were not recorded calling during the site investigations conducted in suitable times of year for detection. As a result, suitable candidate significant wildlife habitat is not found on or within 120 m of the Project location.
- Common Nighthawk – Suitable habitat (logged, burnt over areas or forest clearings), or areas of exposed soils are not common on or within 120 m of the Project location. Where such habitats were found, these areas were transacted by the observed. No Common Nighthawk were recorded. Further, no Common Nighthawk were noted during the crepuscular survey completed for the Project. As a result, suitable habitat for Common Nighthawk is not found on or within 120 m of the Project location
- Five-lined Skink – Suitable habitat (rocky outcrops in association with early successional forest) was not found on or within 120 m of the Project location, and Five-lined Skink were not recorded during the site investigations. Therefore, this species is determined to not be present on or within 120 m of the Project location.
- Milksnake – As Milksnake are habitat generalists, suitable habitat is present on and within 120 m of the Project location. Though not recorded during the site investigations, it is assumed that they are present.
- Eastern Ribbonsnake — Suitable habitat for Eastern Ribbonsnake is found within the wetlands present within 120 m of the Project location. Wetland communities were extensively searched during site investigations. Eastern Ribbonsnake were considered during these site investigations, though none were observed within suitable habitats. As a result, it is determined that they are not likely to be present on or within 120 m of the Project location.
- Northern Map/Spotted/Snapping Turtle – As was previously discussed in Section 4.2.1.2 in relation to turtle nesting habitat, wetland communities within 120 m of the Project location were not conducive to occupancy by turtles. Further, despite extensive searching of the wetland communities, no turtles were noted. Therefore, habitat for turtle species is not found on or within 120 m of the Project location.
- Western Chorus Frogs were not observed during the site investigation but have been identified as having potential for occurrence within the wetland community within 120 m north of the Project location. As a result, habitat for Western Chorus Frog is found within 120 m north of the Project location.

Therefore, candidate significant wildlife habitat for Milksnake, Western Chorus Frog, Northern Flicker, and Eastern Wood-pewee is determined to be present on or within 120 m of the Project location.

4.2.1.4 Animal Movement Corridors

The SWHTG (MNR, 2000) defines animal movement corridors as "elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another". Animal movement corridors were considered during the site investigation. Such features were found to be present within the woodlands and hedgerows on and within 120 m of the Project location.

These features will be further assessed in the evaluation of significance report.

5. Conclusions

Based on the results of the site investigation identified above, there are corrections required to the Records Review Report as areas of wetland that were previously unidentified were recorded on site (see Figure 1.1).

The following natural features are present on and within the vicinity of the Project location and will require an evaluation of significance in order to determine whether an environmental impact study is required:

- wildlife habitat of the Project area, specifically
  - woodlands supporting amphibian breeding ponds on the Project location
  - American Redstart habitat
  - Ovenbird habitat
  - Forest providing a high diversity of habitats
  - Highly diverse areas
  - Raptor winter feeding and roosting areas.
  - habitat for species of conservation concern (Milksnake, Northern Flicker, Eastern Wood-pewee, and Western Chorus Frog) on and within 120 m of the Project location
  - woodlands on and within 120 m of the Project location as animal movement corridors
- woodlands on and surrounding the Project location
- wetland communities on the Project location.

6. References

Hatch Ltd. 2010a. Glendale Solar Project – Natural Heritage Records Review. Prepared for Northland Power Inc. on behalf of Northland Power Solar Glendale L.P. August 2010.

Hatch Ltd. 2010b. Glendale Solar Project – Water Body Site Investigation Report. Prepared for Northland Power Inc. on behalf of Northland Power Solar Glendale L.P. August 2010.

Appendix A

Site Investigation Field Notes

No
Date

Project: (Northland) Glendale

Location: Boundary Rd / Hwy 44 South Glengarry
Date: Sept. 24, 2010
Time: 1000 - 1830
% C.C: 30
Temp:
Wind: 3

- Butternut Health Assessment
  - see forms.

- gray treefrog
- garter snake
- blue jay
- white-throated sparrow
- blackbirds (starlings?)
- Canadian geese
- chipmunk

No
Date

Project: (Northland) Glendale
Location: Boundary Rd / Hwy 44 South Glengarry
Date: Sept 25, 2010
Time: 0900 -
% C.C: 100
Temp:
Wind: 4

- Butternut Health Assessment
  - see forms.

Incidental sightings
- green tree frog
- crow
- blue jay
- chickadee
- Canadian geese
- chipmunk

Butternut Adjacent to Property:
BN-A01 18T 522161 4994474

Project: Glendale
Date: Sept. 26, 2010
Time: 0900
% C.C.: 100
Temp:
Wind: 0

ΔΔ1 + ΔΔ2 - possible drainage features
↳ marks the high water mark of 2 sides
\# 7532 to 7534

Incidental wildlife obs
- Gr. blue heron
- Blue jay
- chickadee
- white throated sparrow
- N. flicker
- Can. Geese

young forest

ELC 1-01 -
1st point - prism sweep
photo# 7543 to 45

American Beech were greater than 50dbh
① 54 dbh

Sugar maple also large - 59 1/2 + 55

- All beech + S. maple > 50 dbh (except for 1)

Adjacent to ELC-01
- Bitternut hickory
Sugar maple
butternut
American Beech
White Ash
Poplar
Basswood

No
Date

thicket or cultural woodland

ELC 2 →

	1	2	3	4
Butternut				
Grey Dogwood			A	
Hawthorn sp.		A		
Sugar Maple			O	
Bristly Black Currant				
Agrimony				
Ash sp				
Bur Oak			R	
Prickly Ash			A	
fern sp.				
Baneberry				
Maple sp.				
Virginia Creeper				
Riverbank grape				
White Ash			A	
gooseberry sp.				
Strawberry sp				
Heal-All				
Buckthorn			O	
Common Apple	O	O		
Aster sp				
Basswood				
Elm				
Lg leaved Agrimony				
goldenrod				

No
Date

common apple
hawthorn
prickly ash
} Dominant

white ash also present
dogwood also abundant

Tag BN-049 - "Prism" survey

Butternut	II
Hawthorn	I
Elm	I
Basswood	III
White Ash	I

	1	2	3	4
red osier dogwood				
rose sp				
Black Ash	R		R	
Raspberry				
goldenrod				
honeysuckle sp				

No Project : Glendale ptwy 4/4
Date Location : Boundary Rd Page 1

Date : June 21, 2010
Time : 1930 - 2000
% C.C : 30%
Beaufort Wind Scale : 1
Temp : 18°C
Bobolink
American Robin
Red-tailed hawk (pair)

Date : June 22, 2010
Time : 0830 - 1930 (11.0 hrs)
% CC : 50%
Beaufort Wind Scale : 1
Temp : 22°C

deer tracks
deer carcass (legs only)

No
Date
Page

low Area in Hay-field

- large boulders, cobbles & stones, bedrock exposed at surface
- low lying area with some tree saplings & wet meadow vegetation, sedges, grasses.
- small rodent observed

red clover
white clover
cow vetch
bird's foot trefoil
black medick
common St. John's wort
meadow horse-tail
grasses
- canada goldenrod
ox-eye daisy

No ....
Date .... Page..........

blue butterfly

small-fruited bulrush
soft-stemmed bulrush
wild parsnip
fragrant bedstraw
awl-fruited sedge
wire sedge
Fox sedge
spikerush
daisy fleabane
goldenrod sp
willow sp.
green sedge
trembling aspen saplings
narrow-leaved meadowsweet
broad-leaved cattail
balsam poplar saplings

No ....
Date .... Page..........

East Woodland

edge - tall buttercup
ox-eye daisy
prickly-ash (A)
raspberry sp
common strawberry
Red or green ash
black ash ?
bur oak
virginia creeper
goldenrod sp. (A)
aster sp
Rock elm
riverbank grape
ironwood
hawthorn (D) shrub
white elm - dead
wild geranium
common elderberry
prickly gooseberry
bittersweet nightshade
fragrant bedstraw
black medick
sedges
rough-fruited cinquefoil
foxglove beardtongue

No
Date Page

moist soil

common chickweed
bur. wood
Staghorn sumac (o)
common milkweed (open area)
Purple flowering raspberry
dogwood sp.

Butternut 18 0522482
4993982

Sugar maple
black cob
white lettuce

No
Date Page

open area
- same meadow sp as everywhere else
- common mullein
- rocky soil

Eastern white boundary
Red elm
Bog wood
Red or green ash
Bur Oak
[illegible]
Hop? American elder Chokecherry
Rock elm
Bur oak
Butternut in hedgerow ~7?

No ...
Date ... Page...

Rock elm
Red maple
dogwood
Comm Apple

Forest

large Rock outcrop
Butternut (O)
Trembling Aspen
American Beech
Sugar Maple
Red maple
Ironwood
Shagbark hickory
Bitternut hickory
Red/Green Ash
Basswood
blue cohosh (A)
White baneberry?
bloodroot

No ...
Date ... Page...

canada violet
Rose twisted stalk
Sharp lobed hepatica
False solomon's seal
Wild sarsaparilla
Helleborine
large-leaved aster
fragrant bedstraw
canada mayflower
white lettuce
christmas fern
silvery glade fern?
Trillium sp. (A)
Mayapple

No ....
Date .... Page..........

Scrub Area

Scrub Area	leopard frog / coyote scat
Basswood	riverbank grape
Sugar Maple	Goldenrod sp. (A)
Ash	grasses
staghorn sumac	ox-eye daisy
Butternut	purple flowering rasp
White Ash?	prickly gooseberry
Bur oak	virginia creeper
Trembling Aspen (D)	black-eye susan
White birch	prickly ash (A)
common apple (A)	nettle
oak (Bur) (A)	
american elm	
shrubby cinquefoil	
common buckthorn	

No ....
Date .... Page..........

Low-lying area

willow sp.
sedges
narrow-leaved meadowsweet
sensitive fern
red osier dogwood
small-flowered bittercress [illegible]
aster sp.
Ash sp. (Green)
small bedstraw (G. trifidum)
silver maple
swamp milkweed

[illegible]

[illegible]
narrow-leaved cattail
sensitive fern
common cattail (Abundant)
balsam poplar

Submergent vegetation
[illegible] sedge
softstem bulrush
hop sedge

No
Date Page

No
Date Page

Back with area

Spruce (R)
Black ash (A)

grasses (reed, canary grass) (D)
Swamp milkweed
willow
red osier

- open water area observed
- Evidence of beaver activity
green frog

Appendix B

Natural Resource Solutions Inc.
Wetlands Site Investigation

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Memo

Project No. 1145

To: **Sean Male**

From: **David Stephenson**

Date: **July 7, 2011**

Re: **Glendale Solar Project Wetland Evaluation**

The wetlands in the vicinity of the proposed Glendale Solar Project lands are unevaluated at this time. The new Natural Heritage Assessment Guide (NHAG) for Renewable Energy Projects (OMNR 2010) allows for the evaluation of these wetlands using Appendix C.

Our assessment of the unevaluated wetland complex, within the catchment area provided on the attached Catchment Area map in accordance with the appropriate sections of the Ontario Wetland Evaluation System for Southern Ontario (MNR 2002), is attached as Table 1. It is our understanding that this table will be used by Hatch to identify potential negative environmental effects and mitigations as required for preparation of an EIS as per the NHAG.

The field study approach taken by NRSI during the August 12, 2010 site visit included:

- Collection and review of background information on wetland-related natural features in the vicinity of the project location.
- Identification of all wetlands, evaluated and non-evaluated, within approximately 750m of the subject wetlands to assess the extent of wetland mapping that would be required to address whether wetlands in the vicinity of the project location would be complexed with other wetlands (i.e. to identify whether a 'string' of unevaluated wetlands occur between the subject wetlands and the nearest evaluated wetland).
- Conducted field surveys of subject wetlands on the project location as well as on neighbouring lands. This included mapping of wetland vegetation communities based on Ontario Wetland Evaluation System (OWES) Northern Manual as well as Ecological Land Classification (ELC), and recording all species of flora and fauna within the wetlands.

The field work focused on the wetlands within the project area. Most of the scores within Table 1 are drawn from the field work completed from the communities within the project area.

As part of Appendix C of the NHAG, we have completed an interspersion map covering the wetlands in the catchment area, and have attached the interspersion map with this memo.

It is assumed that this wetland complex would be provincially significant if a formal wetland evaluation was completed. The complex contains many individual wetlands that are part of a larger habitat network and corridor of natural communities. It is highly likely that significant species are found in this area because of its size and diversity of habitats.

I trust that this information is adequate. If any further information or clarification is needed please contact me.

Yours Sincerely,
Natural Resource Solutions Inc.

David Stephenson, M.Sc.,
Senior Biologist

Work Cited:

Ontario Ministry of Natural Resources. 2010. Natural Heritage Assessment Guide for Renewable Energy Projects. Ontario Ministry of Natural Resources.

Ontario Ministry of Natural Resources. 2002. Ontario Wetland Evaluation System: Southern Manual. Third Edition, revised December 2002.

Appendix C
Natural Heritage Assessment Guide
Completed Analysis

Table 1. Wetland Characteristics and Ecological Functions Assessment for Renewable Energy Projects

Characteristic/ Ecological Function	Evaluation Results	Scoring
Actual Wetland Size (ha)	**Wetland 1:** = 8.48ha Marsh, tall shrub swamp (M1, tsS1) **Wetland 2:** = 9.98ha Coniferous swamp (cS11) **Wetland 3:** = 1.77ha Marsh (M2) **Wetland 4:** = 13.75ha Coniferous swamp (cS12) **Wetland 5:** = 80.79ha Marsh, tall shrub swamp, coniferous swamp (M3, M26, M4, M5, M6, M9, M10, tsS2, tsS3, tsS4, tsS5, cS13) **Wetland 6:** = 3.28ha Deciduous swamp (hS26) **Wetland 7:** = 1.12ha Tall shrub swamp (tsS6) **Wetland 8:** = 0.37ha Marsh (M26) **Wetland 9:** = 23.91ha Marsh, deciduous swamp (M7, hS27) **Wetland 10:** = 1.47ha Marsh (M8) **Wetland 11:** = 4.26ha Coniferous swamp (cS14) **Wetland 12:** = 0.1ha Deciduous swamp (hS28) **Wetland 13:** = 1.26ha Deciduous swamp (hS29) **Wetland 14:** = 0.23ha Deciduous swamp (hS30)	

	Wetland 15: = 1.8ha Deciduous swamp (hS31) **Wetland 16:** = 0.64ha Deciduous swamp (hS32) **Wetland 17:** = 1.01ha Deciduous swamp (hS33) **Wetland 18:** = 3.04ha Coniferous swamp (cS15) **Wetland 19:** = 3.0ha Deciduous swamp (hS34) **Wetland 20:** = 0.83ha Marsh (M13) **Wetland 21:** = 0.34ha Marsh (M11) **Wetland 22:** = 0.3ha Marsh (M12) **Wetland 23:** = 42.85ha Marsh, coniferous swamp, deciduous swamp (M14, cS16, cS17, hS35, hS36, hS37) **Wetland 24:** = 22.85ha Marsh, coniferous swamp, deciduous swamp (M15, M16, cS18, hS38) **Wetland 25:** = 61.12ha Marsh, tall shrub swamp, coniferous swamp, deciduous swamp (M17, M19, M20, tsS8, cS19, cS20, cS21, cS22, cS23, hS39, hS40, hS42) **Wetland 26:** = 2.21ha Marsh (M18) **Wetland 27:** = 3.49ha Tall shrub swamp (tsS7) **Wetland 28:** = 14.67ha Tall shrub swamp, deciduous swamp (tsS9, hS41) **Wetland 29:** = 10.31ha Marsh, coniferous swamp, deciduous swamp (M21, M23, cS25, hS43)	

	Wetland 30: = 3.63 Deciduous swamp (hS44) **Wetland 31:** = 0.92ha Deciduous swamp (hS45) **Wetland 32:** = 2.28ha Deciduous swamp (hS46) **Wetland 33:** = 0.73ha Marsh (M22) **Wetland 34:** = 1.51ha Deciduous swamp (hS47) **Wetland 35:** = 8ha Marsh, deciduous swamp (M24, hS48, hS49) **Wetland 36:** = 6.9ha Marsh, tall shrub swamp, coniferous swamp (M25, tsS10, cS24, cS25) **Wetland 37:** = 7.05ha Deciduous swamp (hS50) **Wetland 38:** =3.1ha Deciduous swamp (hS51) **Total : 353.35ha**	
Wetland Type	Calculations are provided below. **Fractional Area of Wetland Types:** **Swamp:** *Swamp (ha)* Total ha = 286.81 FA=286.81/353.35 =0.81 **Marsh:** *Marsh (ha)* Total ha = 66.53 FA =66.53/353.35 =0.19	9.33
Site Type	Palustrine: 1.0*2 =2	2
Vegetation Communities	Number of communities with 1-3 forms: 38 = 21.5 pts	22

Proximity to other Wetlands	Hydrologically connected by surface water to other wetlands (same dominant wetland type), within 0.5 km	8
Interspersion	See Appended Interspersion Map. Total vertical: 36 Total horizontal: 46 Total = 82	15
Open Water Types	Open water occupies 5-25% of the wetland area, occurring in ponds of various sizes; vegetation occurs in dense patches or diffuse open stands. (Type 3).	14
Flood Attenuation (total)	Details of Flood Attenuation calculations are provided below.	100
Water Quality Improvement (Total)	Details of water quality improvement calculations are provided below.	2.37
Shoreline Erosion Control	Wetland is entirely palustrine.	0
Groundwater Recharge (Total)	Details of Groundwater Recharge calculations are provided below.	2
Species Rarity(Total)	No rare species noted during 2010 surveys within the wetland. **Section** **4.1.2.1 Breeding Habitat for Endangered or Threatened Species** = none **4.1.2.2** T**raditional Migration or Feeding Areas for an Endangered or Threatened Species** = none **4.1.2.3** and **4.1.2.4 Provincially Significant Plant and Animal Species** = none **4.1.2.5 Regionally Significant Species** = none **4.1.2.6 Locally Significant Species** = none **4.1.2.7 Species of Special Status** = none	0
Significant Features and Habitats (Total)	**Section:** **4.2.1 Colonial Waterbirds** = none **4.2.2 Winter Cover for Wildlife** = none **4.2.3 Waterfowl Staging and/or Molting Area** = none **4.2.4 Waterfowl Breeding** = none	0
Fish Habitat (Total)	An unnamed tributary of the Glen Falloch Drain runs from the wetland at the northern end of the Project location. The Glen Falloch Drain itself also runs through a portion of the wetland complex, west of the Project location. The tributary of the Glen Falloch Drain is identified by the Raisin Region Conservation Authority (RRCA) as a Class C Drain under the Fisheries and Oceans Drain Classification System. Class C drains are permanent, warm water drains with no sensitive species or communities present. RRCA noted that this drain may provide baitfish habitat.	

	A visual aquatic habitat survey of the tributaries was conducted on June 22, 2010.The portion of the tributary running from the wetland does not appear capable of providing direct fish habitat since there was no defined channel, although there was evidence of annual surface flow due to the presence of meadow marsh vegetation within a shallow swale-like area leading from the wetland. Based on aerial photograph review, further downstream portions of the tributary channel do appear more well-defined and, therefore, may support baitfish communities. The portion of the tributary leading directly from the wetland would indirectly support downstream fish communities by buffering surface runoff, regulating hydrology and water quality and providing allochthonous inputs (organic matter).	

Wetland Type Calculations:

1.1.2 WETLAND TYPE (Fractional Area = area of wetland type/total wetland area)

	Fractional Area			Score
Bog		x	3	0.00
Fen		x	6	0.00
Swamp	0.81	x	8	6.48
Marsh	0.19	x	15	2.85

Wetland type score (maximum 15 points) 9.33

Flood Attenuation Calculations:

3.1 FLOOD ATTENUATION

If the wetland is a complex including isolated wetlands, apportion the l00 points according to area. For example if 10 ha of a l00 ha complex is isolated, the isolated portion receives the maximum proportional score of 10. The remainder of the wetland is then evaluated out of 90.

Step 1: Determination of Maximum Score

	Wetland is located on one of the defined 5 large lakes or 5 major rivers (Go to Step 4)
	Wetland is entirely isolated (i.e. not part of a complex) (Go to Step 4)
x	All other wetland types (Go through Steps 2,3 and 4B)

Step 2: Determination of Upstream Detention Factor (DF)

(a)	Wetland area (ha)		353.35
(b)	Total area (ha) of upstream detention areas (include the wetland itself)		353.35
(c)	Ratio of (a):(b)		1.00
(d)	Upstream detention factor: (c) x 2 = (maximum allowable factor = 1)	2.00	1.00

Step 3:		Determination of Wetland Attenuation Factor (AF)		
	(a)	Wetland area (ha)		353.35
	(b)	Size of catchment basin (ha) upstream of wetland (include wetland itself in catchment area)		2898.54
	(c)	Ratio of (a):(b)		0.12
	(d)	Wetland attenuation factor: (c) x 10 = (maximum allowable factor = 1)	1.2	1.00
Step 4:		Calculation of final score		
	(a)	Wetlands on large lakes or major rivers		0
	(b)	Wetland entirely isolated		0
	(b)	All other wetlands --calculate as follows:		
	(c	* Complex Formula - Isolated portion	0.0	1
		Initial Score		100 *
		Upstream detention factor (DF) (Step 2)		1.00
		Wetland attenuation factor (AF) (Step 3)		1.00
		Final score: [(DF + AF)/2] x Initial score =		100.00
	(c	* Final score:=	100.0	
		*Unless wetland is a complex with isolated portions (see above).		
		Flood Attenuation Score (maximum l00 points)		100

Water Quality Improvement Calculations:

3.2 WATER QUALITY IMPROVEMENT

3.2.1 SHORT TERM WATER QUALITY IMPROVEMENT

Step 1: **Determination of maximum initial score**

	Wetland on one of the 5 defined large lakes or 5 major rivers (Go to Step 5a)
x	All other wetlands (Go through Steps 2, 3, 4, and 5b)

Step 2: **Determination of watershed improvement factor (WIF)**

Calculation of WIF is based on the fractional area (FA) of each site type
that makes up the total area of the wetland.

(FA= area of site type/total area of wetland)	Fractional Area				
FA of isolated wetland		x	0.5	=	0.000
FA of riverine wetland		x	1	=	0.000
FA of palustrine wetland with no inflow	1.000	x	0.7	=	0.700
FA of palustrine wetland with inflows		x	1	=	0.000
FA of lacustrine on lake shoreline		x	0.2	=	0.000
FA of lacustrine at lake inflow or outflow		x	1	=	0.000
			Sub Total:		0.700
			Sum (WIF cannot exceed 1.0)		0.70

Step 3: Determination of catchment land use factor (LUF)
(Choose the first category that fits upstream landuse in the catchment.)

1)		Over 50% agricultural and/or urban	1.0
2)	x	Between 30 and 50% agricultural and/or urban	0.8
3)		Over 50% forested or other natural vegetation	0.6

LUF (maximum 1.0) 0.80

Step 4: Determination of pollutant uptake factor (PUT)

Calculation of PUT is based on the fractional area (FA) of each vegetation type that makes up the total area of the wetland. Base assessment on the dominant vegetation form for each community except where dead trees or shrubs dominate. In that case base assessment on the dominant live vegetation. (FA = area of vegetation type/total area of wetland)

	Fractional Area				
FA of wetland with live trees, shrubs, herbs or mosses (c,h,ts,ls,gc,m)	0.52	x	0.75	=	0.39
FA of wetland with emergent, submergent or floating vegetation (re,be,ne,su,f,ff)	0.48	x	1	=	0.48
FA of wetland with little or no vegetation (u)		x	0.5	=	0.00
Sum (PUT cannot exceed 1.0)					0.87

Ground Water Discharge Calculations:

3.2.3 GROUNDWATER DISCHARGE

(Circle the characteristics that best describe the wetland being evaluated and then sum the scores. If the sum exceeds 30 points assign the maximum score of 30.)

Wetland Characteristics	Potential for Discharge					
	None to Little		Some		High	
Wetland type	1) Bog = 0	0	2) Swamp/Marsh = 2	2	3) Fen = 5	
Topography	1) Flat/rolling = 0		2) Hilly = 2	0	3) Steep = 5	
Wetland Area:	Large (>50%) = 0	0	Moderate (5-50%) =	0	Small "5%) = 5	
Upslope		0	2	0		
Catchment Area		0				
Lagg Development	1) None found = 0	0	2) Minor = 2	0	3) Extensive = 5	
Seeps	1) None = 0	0	2) = or < 3 seeps = 2	0	3) > 3 seeps = 5	
Surface marl deposits	1) None = 0	0	2) = or < 3 sites = 2		3) > 3 sites = 5	
Iron precipitates	1) None = 0	0	2) = or < 3 sites = 2	0	3) > 3 sites = 5	
Located within 1 km	N/A = 0	0	N/A = 0	0	Yes = 10	
of a major aquifer				0		
Totals		0		2		0

(Scores are cumulative maximum score 30 points)

Groundwater Discharge Score (maximum 30 points) 2

Catchment Area Map

Glendale Solar Project

Catchment Area

Legend

- Project Site
- Wetland Vegetation Community
- Catchment Area
- Highway
- Primary Road
- Secondary Road
- Watercourse (Permanent)
- Watercourse (Intermittent)
- Provincially Significant Wetland
- Waterbody
- Wooded Area

N

0 250 500 750 Meters

NAD83 - UTM Zone 18 Scale: 1:20,000 (2x3')	Project: 1145 Date: June 24, 2011

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Path: X:\1145_GlendaleSolarProject\NRSI_1145_CatchmentArea_20K_2011_06_24_SWM.mxd

Glendale Solar Project

Interspersion Map

Legend

- Wetland Vegetation Community
- Grid (1058.12m x 1058.12m)
- Highway
- Primary Road
- Secondary Road
- Watercourse (Permanent)
- Watercourse (Intermittent)
- Provincially Significant Wetland
- Waterbody
- Wooded Area

0 250 500 750 Meters

NAD83 - UTM Zone 18 Scale: 1:20,000 (2x3')	Project: 1145 Date: June 23, 2011

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Path: X:\1145_GlendaleSolarProject\NRSI_1145_Interspersion_20K_2011_06_23_SWM.mxd

Project Team:

Member	Qualifications	Role
David Stephenson, MSc	Certified Wetland Evaluator Certified ELC Certified Arborist	• Project Management • Field Survey • Data Analysis, Evaluation, Reporting • Natural Heritage Assessment Guide Appendix C – for revised catchment area (air photo interpretation, interspersion mapping, and evaluation)
Kevin Dance, M.Sc.	Certified ELC	• Field Survey • Data Analysis • Evaluation
Matt Ross, B.Sc FWT	Field Biologist	• Field Survey
Cheryl-Anne Payette, B.Sc FWT	Field Biologist	• Data Analysis • Evaluation
Shawn MacDonald, BSc	GIS Mapping	• Mapping

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Wetland Vegetation Communities

Project Name: Glendale **Project #:** 1145

Observer(s): KSD, MR

Date: Aug 12, 2010 **Time (24h):** 8:38

Field #: 2C **Weather:** Precipitation: Ø Temp (°C): 18

Map Code: 9CM3 Wind Speed & Direction: Cloud %:

Wetland Type: M **Site Type:** P **Dominant Form:** gc

% Open Water: Ø **ELC Code:** MAMM2

Photos:

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	
c	
dc,dh,ds	
ts	
ls	willow sp → purple loosestrife
gc	golden rod sp, Queen anne's lace, grata angelica
ne	
be	
re	broad leaved cattail, hardstemed bulrush
ff	
f	
su	
m	

Rare Species (Local, Regional, Provincial):	Wildlife Notes:
none	none.

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

Natural Resource Solutions Inc.

Aquatic, Terrestrial and Wetland Biologists

Wetland Vegetation Communities

Project Name: Glendale **Project #:** 1145

Observer(s): KSD, MR

Date: Aug 12/10 **Time (24h):** 838

Field #: 5 **Weather:** Precipitation: Ø Temp (°C): 18

Map Code: reM3 Wind Speed & Direction: 3 Cloud %: 60

Wetland Type: M **Site Type:** P **Dominant Form:** re

% Open Water: 0 **ELC Code:** MASM1-2

Photos:

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	trembling Aspen, Silver maple, elm sp.
c	
dc,dh,ds	
ts	willow sp.
(ls)	red osier dogwood, narrow-leaved meadowsweet
gc	marsh bedstraw
(ne)	Sedge sp., purple loosestrife, Joe pye-weed, boneset, Spikerush sp.
be	narrow-leaved water plantain, water plantain, water hemlock
(re)	soft-stem bullrush, h?-leaved cattail, black bullrush
ff	
f	
su	
m	

Rare Species (Local, Regional, Provincial):	Wildlife Notes:
	Deer - tk Cherry faced meadowhawk wh-faced meadowhawk COYE CEDW EWPE

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

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Aquatic, Terrestrial and Wetland Biologists

Wetland Vegetation Communities

Project Name: Glendale **Project #:** 1145

Observer(s): KSD, MR

Date: Aug 12/10 **Time (24h):** 838

Field #: 8 **Weather:** Precipitation: Ø Temp (°C): 18

Map Code: Wind Speed & Direction: 3 Cloud %: 60

Wetland Type: N/A **Site Type:** P **Dominant Form:** h

% Open Water: N/A **ELC Code:**

Photos:

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	Green ash > Sugar Maple > T. Aspen & Bitternut Hickory
c	White Spruce, White Cedar & E. Hemlock
dc,dh,ds	
ts	
ls	Alternate Dogwood
gc	Virginia Creeper, Red Raspberry, False Solomon's Seal, Sens. Fern
ne	
be	
re	
ff	
f	
su	
m	

Rare Species (Local, Regional, Provincial):

Wildlife Notes:
wood Frog

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

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Wetland Vegetation Communities

Project Name: Glendale **Project #:** 1145

Observer(s): KSD, MR

Date: Aug 12/10 **Time (24h):** 838

Field #: 9 **Weather:** Precipitation: Ø Temp (°C): 18

Map Code: Wind Speed & Direction: 3 Cloud %: 60

Wetland Type: N/A **Site Type:** P **Dominant Form:** h

% Open Water: N/A **ELC Code:**

Photos:

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	Green Ash > Am. Basswood > Am. Elm > Sugar Maple
c	
dc,dh,ds	
ts	
ls	Choke Cherry, Staghorn Sumac, Alternate Dogwood
gc	Wild Strawberry, Stinging Nettle, white/bane berry, Prickly Gooseberry
ne	
be	
re	
ff	
f	
su	
m	

Rare Species (Local, Regional, Provincial):
Butternut

Wildlife Notes:

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

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Wetland Vegetation Communities

Project Name: Glendale **Project #:** 1145

Observer(s): KSD, MR

Date: Aug. 12/10 **Time (24h):** 838

Field #: 1 **Weather:** Precipitation: ∅ Temp (°C): 18

Map Code: ~~ac~~ Wind Speed & Direction: 3 Cloud %: 60

Wetland Type: M **Site Type:** P **Dominant Form:** gc

% Open Water: none **ELC Code:** MAMM2-5

Photos:

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	Trembling Aspen, Green Ash
c	
dc,dh,ds	trembling Aspen
ts	Willow sp.
ls	red-osier dogwood
gc	purple loosestrife, canada goldenrod
ne	sedge sp.
be	
re	
ff	
f	
su	
m	

Rare Species (Local, Regional, Provincial):

Wildlife Notes:

AMGO

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

Natural Resource Solutions Inc.

Aquatic, Terrestrial and Wetland Biologists

Wetland Vegetation Communities

Project Name: Glendale **Project #:** 1145

Observer(s): KSD, MR

Date: Aug. 12/10 **Time (24h):** 838

Field #: 2a **Weather:** Precipitation: ∅ Temp (°C): 18

Map Code: hS; Wind Speed & Direction: 3 Cloud %: 60

Wetland Type: S **Site Type:** P **Dominant Form:** h

% Open Water: ∅ **ELC Code:** SWDM4-5

Photos:

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	Trembling Aspen, green Ash, bitternut, butternut
c	
dc,dh,ds	elm sp.
ts	
ls	prickley ash, red-osier dogwood, chokecherry
gc	grass sp., wild parsley, purple loosestrife, boneset
ne	
be	
re	br.-leaved cattail, black bulrush
ff	
f	
su	
m	

Rare Species (Local, Regional, Provincial):

Butternut – 3 identified

EAPH
BCCH
AMRE
Cuckoo sp.
RTHU
AMGO

Wildlife Notes:

whitefaced meadowhawk
Cabbage white
white Admiral

Common Gartersnake
↳ 19" long

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

Natural Resource Solutions Inc.

Aquatic, Terrestrial and Wetland Biologists

Wetland Vegetation Communities

Project Name: Glendale **Project #:** 1145

Observer(s): KSD, MR

Date: Aug. 12/10 **Time (24h):** 838

Field #: 2b **Weather:** Precipitation: 0 Temp (°C): 18

Map Code: gcHe **Wind Speed & Direction:** 3 **Cloud %:** 60

Wetland Type: M **Site Type:** P **Dominant Form:** gc

% Open Water: none **ELC Code:** MAMM 2

Photos:

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	
c	
dc,dh,ds	
ts	
(ls)	willow sp.
(gc)	soldenrod sp, queen-anne's-lace, great angelica, prickly lettuce
ne	purple loosestrife
be	
(re)	broad-leaved Cattail, hardstemmed bulrush
ff	
f	
su	
m	

Rare Species (Local, Regional, Provincial):

none

BLJA
EAKI
COYE
COGR

Wildlife Notes:

Red admiral
Cabbage white
black swallowtail

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

Natural Resource Solutions Inc.

Aquatic, Terrestrial and Wetland Biologists

Wetland Vegetation Communities

Project Name: Glendale **Project #:** 1145

Observer(s): KSD, MR

Date: Aug. 12/10 **Time (24h):** 838

Field #: 3 **Weather:** Precipitation: 0 Temp (°C): 18

Map Code: rcHe **Wind Speed & Direction:** 3 **Cloud %:** 60

Wetland Type: M **Site Type:** P **Dominant Form:** re

% Open Water: none **ELC Code:** MAMM 1-2

Photos:

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	
c	
dc,dh,ds	
ts	
ls	
gc	
(ne)	spike rush sp.
be	narrow leaved plantain
(re)	broad-leaved cattail
ff	
f	
su	
m	

Rare Species (Local, Regional, Provincial):

none

Wildlife Notes:

Deer - tk
Raccoon - tk
leopard frog

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated

NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

Wetland Vegetation Communities

Project Name: Glendale **Project #:** 1145

Observer(s): KSD, MR

Date: Aug. 12/10 **Time (24h):** 838

Field #: 7 **Weather:** Precipitation: 0 Temp (°C): 18

Map Code: MAM4 Wind Speed & Direction: 3 Cloud %: 60

Wetland Type: M **Site Type:** P **Dominant Form:** ne

% Open Water: 10% **ELC Code:** MAMM1-3

Photos:

Forms % (Circle those ≥25%)	Species (dominant species, secondary species, present species)
h	green ash, black ash
c	
dc,dh,ds	
ts	alternate-leaved dogwood
ls	nanny berry
(gc)	joe-pye weed, spotted jewelweed, bonesset
(ne)	reed canary, purple loosestrife
be	~~broad-leaved cattail~~, giant burreed
(re)	broad-leaved cattail, hard stemmed bulrush, soft stemmed bulrush
ff	lesser duckweed (lemna minor)
f	
su	
m	

Rare Species (Local, Regional, Provincial):

Wildlife Notes:

Viceroy
Monarch
White faced Meadowhawk
fragile forktail
Green frog
Beaver - old trees cut down in open water area

SAR observations must also include a specific UTM location.

Forms: **h**=deciduous trees; **c**=coniferous trees; **dh, dc, ds**=dead trees/shrubs; **ts**=tall shrubs; **ls**=low shrubs; **gc**=ground cover; **ne**=narrow emergents; **be**=broad emergents; **f**=floating plants; **ff**=free-floating plants; **su**=submerged plants; **m**=mosses

Wetland Type: **S**=swamp; **M**=marsh; **B**=bog; **F**=fen

Site Type: **L**=lacustrine; **P**=palustrine; **R**=riverine; **IS**=isolated