

Natural Heritage Assessment

Evaluation of Significance Report

Belleville TS Demorestville Solar Energy Project

prepared for
AxioPower Canada Inc.

DRAFT



ECOLOGICAL SERVICES

Report Author Signature

Dale Krute

Date

July 7, 2011 (rev.)

Table of Contents

1.0 INTRODUCTION.....	1
1.1 Project Description.....	1
1.2 Renewable Energy Approval Legislative Requirements.....	1
1.2.1 Natural Heritage Assessment Evaluation of Significance Report (EOS).....	2
2.0 EVALUATION OF CANDIDATE SIGNIFICANT NATURAL FEATURES.....	3
2.1 Candidate Significant Woodlands.....	3
2.2 Candidate Significant Wildlife Habitat.....	6
2.2.1 Seasonal Concentration Areas.....	6
2.2.1.1 Songbird migratory stopover areas.....	6
2.2.2 Habitat of Species of Conservation Concern.....	7
2.2.2.1 Open Country Bird Breeding Habitat (forest).....	7
2.2.2.2 Shrub/successional bird breeding habitat.....	8
3.0 SUMMARY OF EVALUATION.....	10
4.0 NEXT STEPS.....	12
5.0 DATE OF BEGINNING AND COMPLETION OF EVALUATION.....	14
6.0 NAMES AND QUALIFICATIONS OF PERSONS CONDUCTING THE EVALUATION OF SIGNIFICANCE.....	15
7.0 LIST OF REFERENCES.....	17

LIST OF TABLES AND FIGURES

Table 2.3 Evaluation criteria for candidate significant open country bird breeding habitat identified in the SI.....	8
Table 2.4 Evaluation criteria for candidate significant shrub/successional bird breeding habitat identified in the SI.....	9
Table 3.1. Summary of corrections required to the site investigation report for the Demorestville Project Location.....	11
Figure 3.1 Significant Natural Features of Axio Demorestville Solar Energy Project Location.....	12

Appendices

Appendix A. Local forest cover in relation to Project Location.....	18
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1.0 INTRODUCTION

1.1 Project Description

Axio Power Canada Inc. (Axio Power) is proposing to develop a 10 megawatt solar photovoltaic project titled Belleville TS Demorestville Solar Energy Project. The Project Location¹ is a 36 hectare (ha) parcel situated on Part of Lots 51 and 52, Concession 1, Sophiasburgh Township, within the County of Prince Edward (single tier municipality) and within Picton Ecodistrict 6E-15. The longitude and latitude are 44° 04' 30.86" and 77° 16' 15.71".

1.2 Renewable Energy Approval Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, made under the *Environmental Protection Act* identifies the Renewable Energy Approval (REA) requirements for renewable energy projects in Ontario. Ground-mounted solar facilities with a nameplate capacity greater than 10 kilowatts (kW) are classified as Class 3 solar facilities and require a REA in accordance with Section 4 of O. Reg. 359/09. Subsection 24 (1) of O. Reg. 359/09 requires proponents of Class 3 solar projects to undertake a natural heritage assessment consisting of a records review report, site investigation report and an evaluation of significance report for each natural feature identified during the natural heritage records review and site investigation.

Natural features are defined in subsection 1 (1) of O. Reg. 359/09 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.

The *Natural Heritage Assessment Records Review Report (NHARR)* Hatch Ltd., 2011a) and *Natural Heritage Assessment Site Investigation Report (SI)* (Ecological Services, 2011) did not identify any ANSI's, wetlands or valleylands on or within 120 m of the Project Location. However, there were confirmed significant woodlands (Hatch Ltd., 2011a) and candidate significant wildlife habitat (Ecological Services, 2011) on and within 120 m of the Project Location that will need to be evaluated to determine significance.

¹ "Project Location means, when used in relation to a renewable energy project, a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposed to engage in the project" (O. Reg. 359/09, s. 1 (1)).

1.2.1 Natural Heritage Assessment Evaluation of Significance Report (EOS)

Section 27 of the REA Regulation requires proponents of Class 3 solar projects to prepare a *Natural Heritage Assessment Evaluation of Significance Report (EOS)* for natural features identified in the *NHARR* (Hatch, 2011a) and *SI* (Ecological Services, 2011) that sets out:

- a determination of whether the natural feature is:
 - provincially significant or not provincially significant (i.e. wetlands and ANSI's)
 - significant or not significant (i.e. woodland, valleyland or wildlife habitat)
- summary of the evaluation criteria or procedures used to make the determination
- the name and qualifications of any person who applied to evaluation criteria or procedures.

This report has been prepared to meet these requirements. A map showing the boundaries of the significant natural features identified in this report (Figure 3.1) has also been prepared. As mentioned in Section 1.2, there are no wetlands or ANSI's on or within 120 m of the Project Location. Therefore, an evaluation to determine if these features are provincially or non-provincially significant is not required. However, there are confirmed significant woodlands and candidate significant wildlife identified on and within 120 m of the Project Location that will be evaluated to determine significance. Although the municipality has confirmed the presence of significant woodlands on and within 120 m of the Project Location, these woodlands will be evaluated to reflect the information obtained during the site investigation (Ecological Services, 2011).

2.0 EVALUATION OF CANDIDATE SIGNIFICANT NATURAL FEATURES

2.1 Candidate Significant Woodlands

The *NHARR* (Hatch Ltd., 2011a) identified *woodland* to the east overlapping 120 m adjacent lands of the Project Location and *treed hedgerows* occurring within the Project Location envelope. The following evaluation will determine if these features meet the criteria for significance as per Section 7 of the *Natural Heritage Reference Manual* (MNR, 2010).

Woodlands are defined in subsection 1 (1) of the REA Regulation as:

- a) land that is south and east of the Canadian Shield
- b) land that has per hectare, at least
 - 1. 1000 trees of any size
 - 2. 750 trees measuring over 5 cm in diameter
 - 3. 500 trees measuring over 12 cm in diameter
 - 4. 250 trees measuring over 20 cm in diameter
- c) land that does not include a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees.

The boundaries of the woodland identified in Figure 3.1 were delineated based on observations made during the site investigations and air photo interpretation and follow the REA criteria for woodland. The LIO woodland mapping shown in the *NHARR* (Hatch Ltd., 2011a) is considered accurate.

The criteria for establishing woodland significance are identified in Section 7 of the *Natural Heritage Reference Manual* (*NHRM*) (Ontario Ministry of Natural Resources (MNR), 2010a) and in the *Natural Heritage Assessment Guidelines for Renewable Energy Projects* (MNR, 2010b). The criteria for establishing significance and how the woodlands were evaluated against the criteria are discussed for the woodland identified on and within 120 m of the Project Location. Woodland that meets a suggested minimum standard set out in the *NHRM* (MNR, 2010) for any one of the criterion is considered significant.

Woodland

- **Woodland size** – The significance of woodland based on size is related to the amount of woodland coverage within a region. The Project Location is within Picton Ecodistrict 6E-15, which has approximately 37% natural area coverage (Henson and Brodribb, 2005). According to the *NHRM* (MNR, 2010), where woodlands represent 30–60% of the land cover, woodlands 50 ha in size or greater should be considered significant. The 5 ha woodland overlapping the 120 m adjacent lands east of the Project Location are part of a 121 ha local woodland that extends north and east. This *Woodland* therefore meets the size requirements for significance for this region.
- **Ecological function**
 - *Woodland interior* – Where woodlands represent 30–60% of the land cover, 8 ha or more of interior habitat is considered significant (MNR, 2010). Woodland interior habitat is typically defined as habitat more than 100 m from a defined edge. Applying this criterion to the larger 121 ha woodland north and east of the Project Location results in 63 ha of

potential interior woodland habitat (Appendix A). However, no interior woodland habitat is presumed to be present within those portions used as cattle pasture as there are large gaps in the canopy and regular disturbance from grazing. The woodland interior criterion has therefore not been met.

- *Proximity to other woodlands or other habitats* – Woodlands within 30 m of a significant natural feature receiving ecological benefit from the woodland and are 0.5 – 20 ha in size are considered significant (MNR, 2010). As the identified woodland provide significant wildlife habitat (*shrub/early successional bird breeding habitat*, see section 2.2.3.1), this criterion has been met.
- *Linkages* – Woodlands providing a connecting link between two other significant features (i.e. within 120 m) are considered significant (MNR, 2010). The identified woodland provides linkages for significant wildlife habitat. Therefore, this criterion has been met.
- *Water protection* – Woodlands within 50 m of a water feature (e.g. groundwater discharge / recharge area, headwater area, watercourse) are considered significant (MNR, 2010). The identified woodland is not within 50 m of Demorestville Creek, a seasonal watercourse located to the north of the Project Location. This criterion has therefore not been met.
- *Woodland diversity* – A woodland is considered significant if it has: a naturally occurring composition of native forest species that have declined significantly south and east of the Canadian Shield and meet minimum area thresholds (e.g.: 1–20 ha, depending on circumstance), a high native diversity through a combination of composition and terrain (e.g., a woodland extending from hilltop to valley bottom or to opposite slopes) and meets minimum area thresholds (e.g.: 2–20 ha, depending on circumstance) (MNR, 2010). As the identified woodland not does include a native mixed stands with species representation that meets this criterion. Therefore, this criterion has not been met.
- *Uncommon characteristics* – Woodlands that include provincially rare plant species or vegetation communities (i.e. S-rank: S1 to S3) and/or old-growth trees (i.e., 10 or more trees / ha greater than 100 years old) are considered significant (MNR, 2010). No provincially rare species or communities were encountered during the *SI*. This criterion has not been met.
- *Economic and social functional values* – Woodlands with high economic or social values (e.g. air-quality improvement, recreation, education, cultural and historical value) are considered significant (MNR, 2010). As large portions of this woodland are used as cattle pasture by a landowner, it is not considered to provide significant economic or social function values. Therefore, this criterion has not been met.

Tree Hedgerows

- **Woodland size** – The area of woodland encompassed by the treed hedgerows that cross the Project Location is <1 ha. This criterion has not been met.
- **Ecological function**

- *Woodland interior* – No interior habitat is found within *the treed hedgerows*. The woodland interior criterion has therefore not been met.
- *Proximity to other woodlands or other habitats* – The treed hedgerows discontinuous features that are not within 30 m of wildlife habitat or significant woodlands. They are below the minimum size criterion of 10 ha for significance. Accordingly, this criterion has not been met.
- *Linkages* – The treed hedgerows are discontinuous features that do not provide linkages for significant wildlife habitat including habitat for area sensitive species of conservation concern, as they are below the minimum size criterion of 10 ha for significance. Accordingly, this criterion has not been met.
- *Water protection* – Some portions of treed hedgerows on the Project Location are associated with seasonal watercourses (farm drains) that have been constructed to manage seasonal water flow. However, these drains do not contain fish or wildlife habitat and are maintained as grass swales for most of their length. As the tree and shrub cover associated with these features are not considered to provide any ecological function in terms of habitat protection or provision and they are below the minimum size criterion of 4 ha for this region, this criterion is not considered to have been met.
- *Woodland diversity* – The treed hedgerows do not meet the criterion for woodland diversity and they are below the size criterion of 4 ha for this region.
- *Uncommon characteristics* – No provincially rare species or communities or old growth features are found within the treed hedgerows and they are below the size criterion of 10 ha. This criterion is not considered to have been met.
- *Economic and social functional values* – The treed hedgerows do not provide significant economic or social function values and they are below the minimum size criterion of 4 ha. This criterion has not been met.

Evaluation – To be considered significant woodland, at least one of the above criteria must be met. For the identified features associated with the Project Location and 120 m adjacent lands, only woodland overlapping the 120 m adjacent lands east of the Project Location meets at least one of these criteria. Accordingly, this feature has been evaluated as significant and will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report* as the proposed development is within 120 m of this natural feature.

2.2 Candidate Significant Wildlife Habitat

Wildlife habitat assessment guidelines indicated in the *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules (MNR, 2009b)* for Site Region 6E identifies the main types of wildlife habitat that can be classified as significant: seasonal concentrations areas, rare vegetation communities, specialized habitats for wildlife, habitats of species of conservation concern and animal movement corridors. Within each of these types of wildlife habitat are specific habitat types to reflect the life history requirements of an individual or group of species.

The criteria that were considered during this evaluation and how they were assessed are discussed for each of the candidate significant habitat types for the candidate significant wildlife habitat features (*seasonal concentration areas* and *habitat of species of conservation concern*) identified in the *SI* (Ecological Services, 2011).

2.2.1 Seasonal Concentration Areas

Specific criteria used to evaluate *seasonal concentration areas* are identified in Tables Q-1 (and Q-2), Appendix Q in the *SWHTG (MNR, 2000)*. The *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules (MNR, 2009b)* was also used to supplement information obtained in the *SWHTG (MNR, 2000)*. The criteria that were considered during this evaluation and how they were assessed are discussed for the candidate significant habitat type of *specialized habitats for wildlife* identified in the *SI* (Ecological Services, 2011).

2.2.1.1 Songbird migratory stopover areas

For Site Region 6E, *songbird migratory stopover areas* are defined as woodlands located on peninsulas or points or oriented in north to south direction along the shore and located within 5km of Lake Ontario, and according to the *SWHTG (MNR 2000)* stopover areas must include a variety of habitat types of >10 ha that provide adequate food and shelter for a minimum of 35 migratory species. Important stopover areas are well known for this area (e.g., Amherst Island, Presqu'île, and Prince Edward Point) and are surveyed regularly by local naturalist groups (Weir, 2008). These locations are all islands or peninsular woodlots that extend into Lake Ontario. OBBA survey data show >35 migrant bird species for the survey square that include the Project Location (*NHARR – Hatch Ltd., 2011a*). The Project Location is within 5 km of the Lake Ontario shoreline and is within the Napanee Plains Important Bird Area. During the breeding bird point count in 2010, 28 migratory songbird species were reported within the Project Location and 120m adjacent lands.

There are no woodlands on the Project Location and the open woodlands located to the east within 120 m are used as cattle pasture.

Evaluation –The woodland within 120 m of the Project Location does not occur on an island or peninsula as is the case for the identified significant migrant songbird stopover habitats in this region. The open red cedar woodland is in poor condition as it is used as cattle pasture and it is not a habitat type typically supportive of high diversity of songbirds. Although this woodland possesses qualities generally supportive of nesting Loggerhead Shrike (i.e., patchy red cedar, grazed understory), there are no local nesting records for this species as indicated in the *SI* (Ecological Services, 2011). Most of the songbirds reported are relatively common species within agricultural landscapes and successional woodlands that

dominate this region. Accordingly, although woodlands within 120 m of the Project Location provide limited habitat for migrant species, *significant songbird migratory stopover area habitat* is not considered to be present. This wildlife habitat feature will not be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report* to assess potential negative environmental effects.

2.2.3 Habitat of Species of Conservation Concern

Criteria used to evaluate *habitat of species of conservation concern* are identified in Table Q-3 of Appendix Q in the *SWHTG* (MNR, 2000). The *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules* (MNR, 2009b) was also used to supplement information obtained in the *SWHTG* (MNR, 2000). The criteria considered and how they were applied in the evaluation of each of the candidate significant habitats of species of conservation concern identified in *SI* (Ecological Services 2011) are discussed below.

2.2.3.1 Open country bird breeding habitat

Candidate significant breeding habitat for bird species that prefer open vegetation communities was identified in the *SI* within the 36 ha Project Location, which in 2010 was represented by fallow fields and hay crops.

Table 2.3 below presents the evaluation of *shrub/early successional breeding habitat* found on and within 120 m of the Project Location based upon criteria presented in the *Ecoregion Criteria Schedules* (MNR 2009b). Several species known to prefer this habitat type were encountered during the breeding bird survey in 2010 including Killdeer, Kingbird, Bobolink, Eastern Meadowlark, Grasshopper Sparrow and Savannah Sparrow. In 2011, most of these fallowed fields had been ploughed in preparation for cash crops (wheat) and no open country indicator species were encountered.

Table 2.3 Evaluation criteria for candidate significant open country bird breeding habitat identified in the SI.

Criterion	Requirements from SWHTG Ecoregion Criteria Schedules (MNR 2009b)	Description of Open Country Bird Breeding Habitat	Criterion Met
Presence of indicator species and species of conservation concern	<ul style="list-style-type: none"> • Presence of nesting or breeding of 2 or more indicator (Bobolink, Grasshopper Sparrow, Vesper Sparrow, Upland Sandpiper) or special concern species and at least 1 of the common species (Eastern Kingbird, Eastern Meadowlark, Northern Harrier, American Kestrel) . • <u>Note:</u> a field with breeding Short-eared Owl is to be considered a Significant Wildlife Habitat. 	<ul style="list-style-type: none"> • Two indicator species (Bobolink, Grasshopper Sparrow) observed on Project Location. • 2 common species observed (Eastern Kingbird, Eastern Meadowlark) • Numbers of individuals one to several 	√
Overall area	<ul style="list-style-type: none"> • Open land meadow >30 ha 	<ul style="list-style-type: none"> • In 2010, most of 36 ha Project Location and adjacent lands to the west in fallow condition or hayfield 	√
Land Use History	<ul style="list-style-type: none"> • sites considered significant should have a history of longevity (i.e., not actively farmed in last 5 years). 	<ul style="list-style-type: none"> • Project Location has been continually managed in rotation between fallow field/hayfield and cash crop requiring ploughing 	
Site Disturbance	<ul style="list-style-type: none"> • Should be free from human disturbance and not in close proximity to residential areas or transportation corridors 	<ul style="list-style-type: none"> • Site is ploughed on a regular basis to support crop production 	

Evaluation – Although the Project Location provided habitat for open country breeding birds in 2010 when it was a fallow field, the site was ploughed in 2011 and rotated back into cash crop production. This form of disturbance creates a habitat type that is temporary in nature and therefore cannot be considered as significant. Accordingly, this feature will not be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

2.2.3.2 Shrub/early successional bird breeding habitat

Candidate significant breeding habitat for bird species that prefer shrub/early successional vegetation communities was identified in the *SI* on and within 120 m of the Project Location. Patches of red cedar dominated cultural thicket occur within the open woodlands to the east of the Project Location, and extends for several hundred hectares across the local region. In 2010, the farmland associated with the Project Location was maintained as a fallow field or hay crop that also provided open land habitat for some of these habitat generalist species.

Table 2.3 below presents the evaluation of *shrub/early successional breeding habitat* found on and within 120 m of the Project Location based upon criteria presented in the *Ecoregion Criteria Schedules* (MNR 2009b).

Table 2.4 Evaluation criteria for candidate significant shrub/successional bird breeding habitat identified in the SI.

Criterion	Requirements from SWHTG Ecoregion Criteria Schedules (MNR 2009b)	Description of Open Country Bird Breeding Habitat	Criterion Met
Presence of indicator species and species of conservation concern	<ul style="list-style-type: none"> presence of nesting or breeding of 2 or more indicator (Brown Thrasher, Clay-coloured Sparrow) or special concern species (Yellow-breasted Chat, Golden-winged Warbler) and at least 1 of the common species (Field Sparrow, Black-billed Cuckoo, Eastern Towhee, Willow Flycatcher, or Blue-winged Warbler). A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. 	<ul style="list-style-type: none"> 2 shrubland indicator species (Brown Thrasher, Clay-coloured Sparrow) observed. Two common species (Field Sparrow, Eastern Towhee) observed Numbers of individuals low 	√
Overall area	<ul style="list-style-type: none"> Shrubland or successional areas >30 ha 	<ul style="list-style-type: none"> Patches of shrub thicket occur across local regional woodlands for several hundred ha, including within 120 m of Project Location 	√
Land Use History	<ul style="list-style-type: none"> sites considered significant should have a history of longevity (i.e., not actively farmed in last 5 years). 	<ul style="list-style-type: none"> Shrub thicket communities present for >5 years although used traditionally as cattle pasture 	√
Site Disturbance	<ul style="list-style-type: none"> Should be free from human disturbance and not in close proximity to residential areas or transportation corridors 	<ul style="list-style-type: none"> Cattle pasture disturbance hinders regeneration of woodland, but maintains open shrubland patches Not in close proximity to residential or transportation areas 	√

Evaluation –patches of shrub thicket occur throughout the local woodland communities to the east and north of the Project Location and provide habitat for a number of shrub/early successional breeding birds. Shrub patches do not occur on the Project Location but do occur within 120 m. Accordingly, this feature will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report*.

3.0 SUMMARY OF EVALUATION

Based on the findings in this report, the following natural features have been evaluated as significant:

- **Significant Woodlands** –Woodlands within 120 m of the Project Location to the east have been evaluated as significant.
- **Significant Wildlife Habitat** – The following wildlife habitat type has been evaluated as significant:
 - **Habitats of species of conservation concern** – *shrub/early successional bird breeding habitat*

Therefore, the significant natural features identified above will be carried forward to the *Natural Heritage Assessment Environmental Impact Study Report* to assess the potential negative environmental effects on these features. A map showing the locations of these habitat types is provided on Figure 3.1. Table 3.1 is a summary of natural features identified in the *SI* and *EOS* reports for the Demorestville Project Location.

Table 3.1. Summary of corrections required to natural features identified by the records review (Hatch Ltd., 2011a).

SITE INVESTIGATION					EVALUATION OF SIGNIFICANCE		
Type	Functions and Attributes	Composition	Distance from Project Location (PL)	Corrections to Records Review?	Evaluation Criteria/ Procedures Used	Significant Natural Feature Confirmed?	Defining Criteria
Candidate Significant Woodland	Woodland - Size: 5 ha of 121 ha local woodland - Proximity to significant woodlands - Linkage - Wildlife habitat	- <i>Red Cedar Cutural Woodland (CUWI-1)</i>	- 8 m from west edge of woodland	No	<i>NHRM</i> (MNR 2010) significant woodland evaluation criteria	Yes	- Size - woodland - Proximity to significant woodlands - Linkage - Wildlife habitat
Candidate Significant Woodland	Treed Hedgerow - Linkage - Water Protection	- <i>Mixed deciduous and coniferous trees and shrubs</i>	- within PL	No	See above	No	None present
Habitats of Species of Conservation Concern	<i>Open country bird breeding habitat</i>	- open meadow habitat available in 2010 - Indicator species present	- encompassed by Project and 120 m adjacent lands	No	See above	No	- open meadow habitat not available in 2011 (normal crop rotation)
	<i>Shrub/early successional bird breeding habitat</i>	- shrub thicket areas within 120 m adjacent lands - Indicator species noted	- on and within 120 m of PL	No	See above	Yes	- shrub thicket within 120 m and on adjacent lands - Indicator species noted

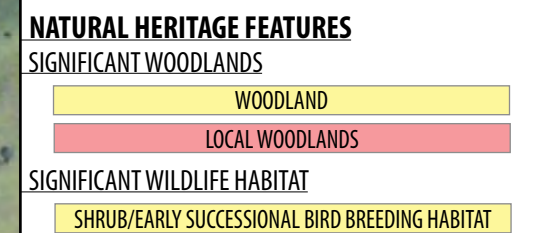
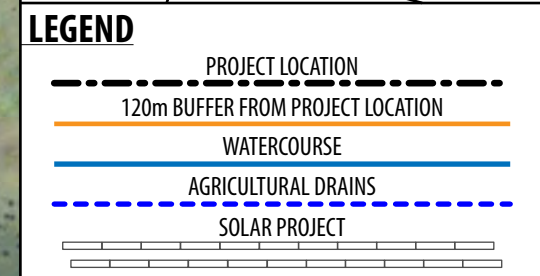
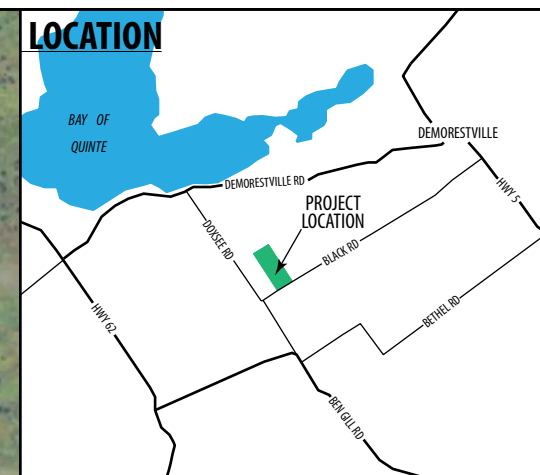
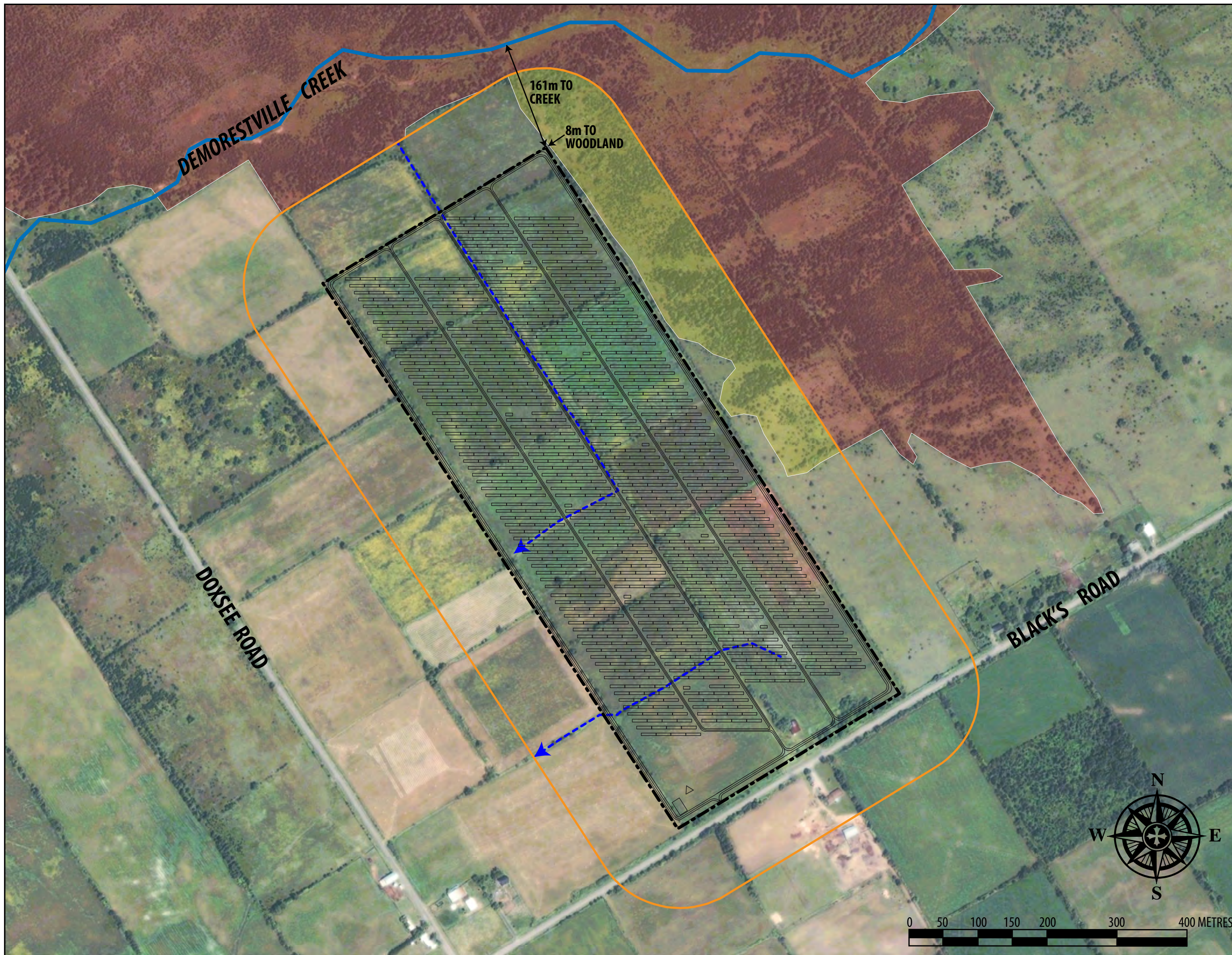


FIGURE 3.1

axiopower

Ecological Services

McINTOSH PERRY
Consulting Engineers Ltd.

TITLE BELLEVILLE TS DEMORESTVILLE NATURAL HERITAGE FEATURES		
DATE JULY 6, 2011	PROJECT No. KP-11-626	FIGURE

4.0 NEXT STEPS

- A *Natural Heritage Assessment Environmental Impact Study Report* conducted according to the requirements of Subsection 38 (2) of O. Reg. 359/09 will be required in order to assess the potential effects, and recommend mitigation and monitoring requirements for the construction, operating and decommissioning of Project components within 120 m of these significant natural features.

5.0 DATE OF BEGINNING AND COMPLETION OF EVALUATION

Start: 1st Draft: September 10, 2010; 2nd Draft: May 30, 2011

Completion: July 7, 2011.

6.0 NAMES AND QUALIFICATIONS OF PERSONS CONDUCTING THE EVALUATION OF SIGNIFICANCE

The EOS assessment and report were completed by:

Dale Kristensen: Consultant, Ecological Services

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Web Site: <http://ecologicalservices.webs.com/>

Ecological Services is a locally owned firm, specializing in the provision of services relating to ecological management and research. We have been in operation in eastern Ontario since 1985. Our core personnel combine education and experience to give us a strong focus on land use planning and management as they relate to natural resources. Our experience includes environmental impact assessments, management plans, wetland evaluations, and municipal land use planning. We have research experience in aquatic ecology and chemistry, forest fragmentation, avian ecology, and fisheries ecology.

We have worked with government at the federal, provincial, local and international levels. Other clients have included Crown corporations, planning and engineering firms, developers, and local groups. Our association with Queen's University provides us immediate access to current and broad-based research, and also provides us with a pool of expert associates. A work prospectus is available at our website at <http://ecologicalservices.webs.com>.

CURRICULUM VITAE OF DALE KRISTENSEN

Relevant Employment Experience

1988 - present: Environmental Consultant with Ecological Services

- Specializing in floral and faunal resource inventories, wetland evaluations, environmental impact assessments, habitat analyses, and habitat restoration.

1996 - present. Phytotron Manager (Plant Research Facility). Dept. of Biology, Queen's University.

- Manager of a controlled environment facility for plant and other research

2008 – present: Curator Queen's University Fowler Herbarium

1987- 2009: Adjunct Academic. Department of Biology at Queen's University.

Development and instruction of various courses at Queen's University, including:

- | | |
|--|---|
| - Wildlife Issues in a Changing World (ENSC 320) | - Restoration Ecology (BIOL 522) |
| - Biology of Sex (BIOL 210) | - Field Botany (BIOL 320) |
| - Field ecology module at Lake Opinicon (BIOL 344) | - International graduate-level course on biodiversity |

Education

M.Sc., 1996 (Ecology) Queen's University. Kingston, Ontario.

B.Sc., 1981 (Wildlife Biology), University of Guelph. Guelph, Ontario.

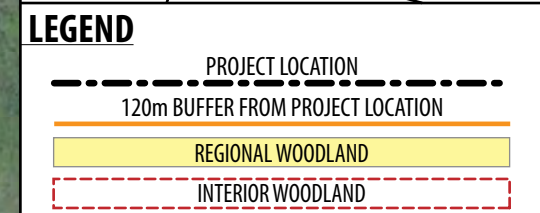
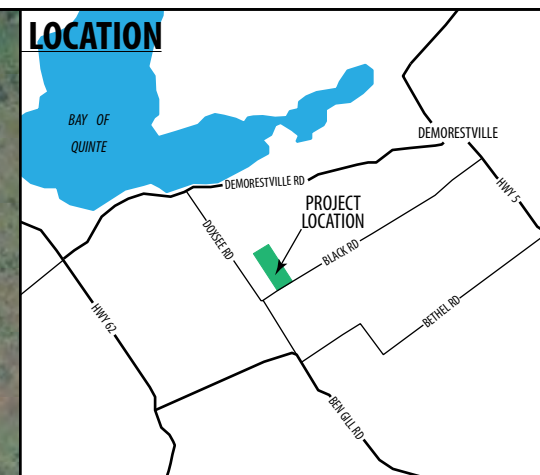
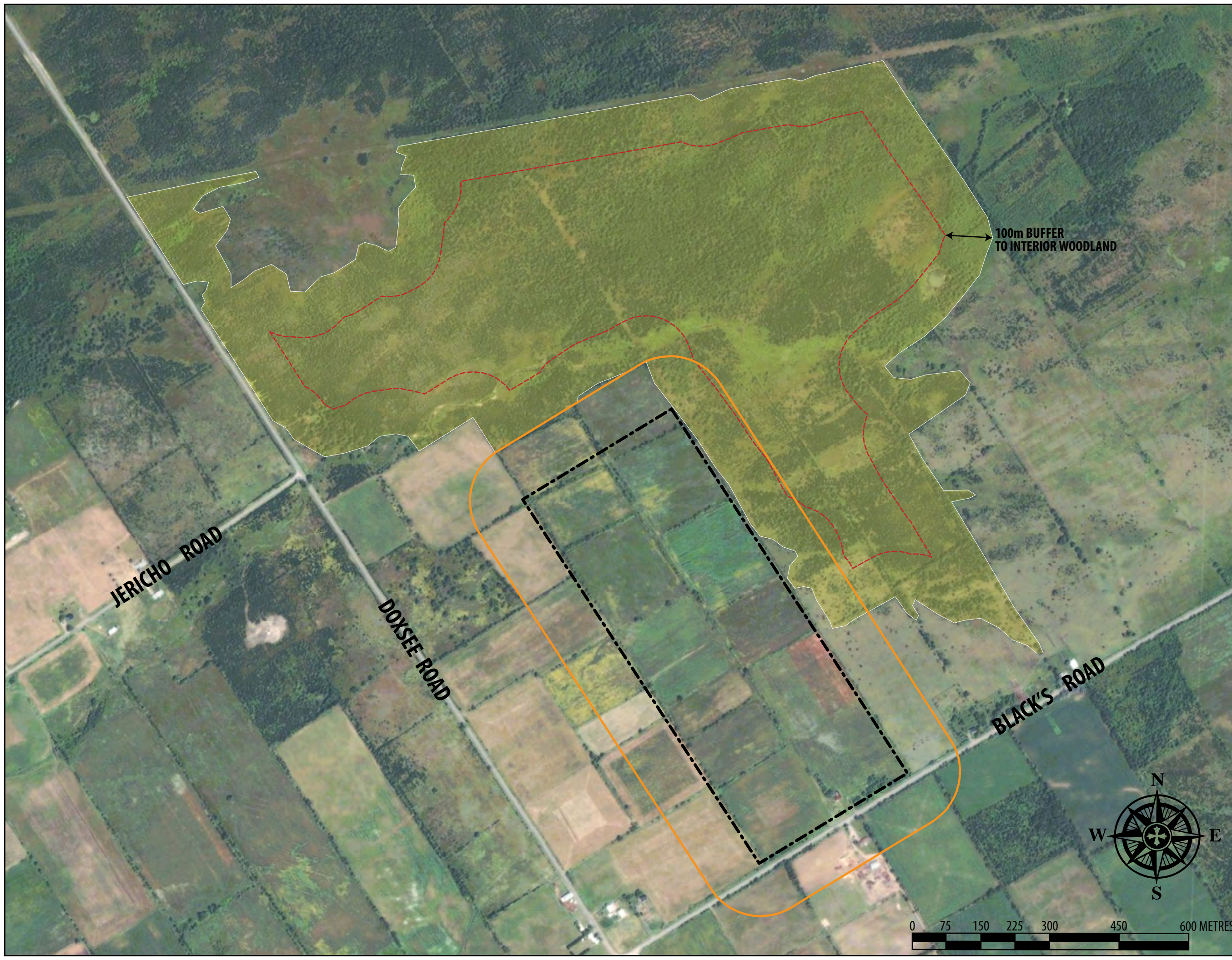
Affiliations

Ecological Restoration Society, North American Wildflower Society, Land Conservancy for Kingston, Frontenac, Lennox & Addington, Kingston Field Naturalists, COSEWIC Species Recovery Team – Deerberry (*Vaccinium stamineum*) and Cerulean Warbler (*Dendroica caerulea*) habitat modelling for St. Lawrence Islands National Park. Provincially Certified Butternut Health Assessor

7.0 LIST OF REFERENCES

- Ecological Services. 2011. Natural Heritage Assessment Site Investigation Report for Belleville TS Demorestville Proposed Solar Energy Project.
- Gleason, Henry A. and Arthur Cronquist. 1991. Manual of the Vascular Plants of Northeastern United States and Adjacent Canada, Second Edition. D. Van Nostrand, N.Y
- Hatch Limited. 2011. Belleville TS Demorestville Solar Energy Project Natural Heritage Assessment Natural Heritage Records Review Report. Axio Power Canada Inc. and Canadian Solar Solutions Inc.
- Henson, B.L. and K.E. Brodribb 2005. *Great Lakes Conservation Blueprint for Terrestrial Biodiversity, Volume 2: Ecodistrict Summaries*. Nature Conservancy of Canada.
- Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. Ecological Land Classification for Southern Ontario. Natural Heritage Information Centre, OMNR Peterborough.
- NAVTEQ 2010. Satellite imagery . Available at www.bing.com/maps
- Ontario Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. 151 pp. Fish and Wildlife Branch, Technical Section.
- Ontario Ministry of Natural Resources. 2009a. Approval and Permitting Requirements Document for Renewable Energy Projects
- Ontario Ministry of Natural Resources. 2009b. Significant Wildlife Habitat: Decision Support System
- Ontario Ministry of Natural Resources 2009c. Significant Wildlife Habitat Ecoregion Criteria Schedules. Addendum to Significant Wildlife Habitat Technical Guide. Working Draft January 2009
- Ontario Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, Draft Edition.

Appendix A. Local forest cover in relation to Project Location



WOODLAND NORTH OF BLACK'S ROAD
REGIONAL WOODLAND = 121.4ha
INTERIOR WOODLAND = 62.9ha

axiopower



Ecological
Services



**McINTOSH
PERRY**
Consulting Engineers Ltd.

TITLE BELLEVILLE TS DEMORESTVILLE PROJECT LOCATION & REGIONAL WOODLAND		
DATE JULY 6, 2011	PROJECT No. KP-11-626	FIGURE