Penn Energy- Van Dorp
SOLAR ENERGY FACILITY

in the Municipality of Port Hope
Northumberland County
FIT Application No. FIT-FLTV77L
FIT Contract No. F-001573- SPV-130-505

Natural Heritage Assessment
Environmental Impact Study

Prepared for: Penn Energy Renewables Ltd.
620 Righters Ferry Road, Bala Cynwyd, PA 19004

Submitted by: Niblett Environmental Associates Inc.
PN 10-066

October 2012

Niblett Environmental Associates Inc.
Biological Consultants

October 26, 2012 PN 10-066

Penn Energy Trust
620 Righters Ferry Road
Bala Cynwyd, PA 19004

Attention : Mr. Glen Tomkinson

RE: **Penn Energy- Van Dorp**
SOLAR ENERGY FACILITY
in the Municipality of Port Hope, Northumberland County
FIT Application No. FIT-FLTV77L
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Natural Heritage Assessment
Environmental Impact Study

Dear Mr. Tomkinson:

We are pleased to submit the Environmental Impact Study Report for the proposed Van Dorp solar energy facility as part of the Natural Heritage Assessment for this project.

The report follows the outline provided in the MNR Natural Heritage Assessment Manual.

If there are any comments or questions on the content please contact us.

Yours very truly,

Chris Ellingwood
President and Sr. Terrestrial and Wetland Biologist

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1.0 Introduction

Part V, Section 38 of the REA regulation requires that an Environmental Impact Study (EIS) be completed to identify the potential negative environmental effects that may result from the proposed solar facility and outline mitigation and monitoring required to minimize any impacts. An EIS report is done when the proposed REGF project location is within 120 meters of a natural feature that has been evaluated as significant or is being treated as significant.

The NHA process on the Van Dorp Solar Energy Facility has identified two features that have been treated as significant, generalized significant wildlife habitat and wetland WE-01 .

1.1 Overview

The proposed Penn Energy-Van Dorp facility is located west of the Town of Port Hope. This property is bounded on the north by Highway 401, on the east by Wesleyville Road, on the south by Mail Road, and on the west side by private property (Figure 1). The subject property encompasses 124 acres (56.1 ha). The study area extends 120 m beyond the boundary of the project area to account for wildlife habitat components.

The proposed solar energy facility will consist of approximately 55, 000 PV modules and 10-15 modular collection houses. Modules are grouped in arrays (8-24 each) which are aligned in rows; these rows are separated by access aisles approximately 5-6 meters in width. The site plan for the Van Dorp site can be seen in Appendix F. The entire project area will be enclosed with a security/safety fence and laneways will be located within the project area to provide access to the collection houses, modules, and perimeter fence. The access lanes would consist of a typical farm lane configuration. Electrical collection and distribution lines will consist of underground and/or overhead lines and will connect to the power grid at a nearby distribution line. The solar modules are mounted above the ground and as such allow for low growing herbaceous vegetation to be planted underneath. Such vegetation will minimize erosion and permit infiltration of precipitation into the surface soils of the site. Penn anticipates that the foundation system for the arrays would be completed by pile driving or core drilling pipes into the ground. The exact methods will be decided following appropriate geotechnical investigations. The Site Plan for the Van Dorp site can be seen in Appendix F.

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STUDY AREA

PROJECT LOCATION

RUNNALLS ROAD
JONES ROAD
4TH LINE
PIT ROAD
MORRISH CHURCH ROAD
KELLOGG ROAD
COUNTY ROAD 10
COUNTY ROAD 2
GUIDEBOARD ROAD
ROSEBERRY HILL ROAD
COUNTY ROAD 65
ZION ROAD
SYMONS ROAD
DEER PARK ROAD
HIGHWAY 401
BRAND ROAD
CLARKE ROAD
MARSH ROAD
MCCULLOUGH ROAD
BESTS ROAD
WOOLACOTT LANE
DICKINSON ROAD
HASKILL ROAD
MAIL ROAD
SERVICE CENTRE RAMP
WILLOW BEACH ROAD
LAKESHORE ROAD
WALLACE WOOD ROAD
WESLEYVILLE ROAD
PORT BRITAIN ROAD
CONCESSION ROAD 1
MARYDALE PARK ROAD
STACEY ROAD
EAST TOWNLINE ROAD
NICHOLLS ROAD

704000 704500 705000 705500 706000 706500 707000 707500 708000 708500 709000 709500 710000 710500 711000 711500 712000 712500 713000 713500 714000 714500 715000 715500

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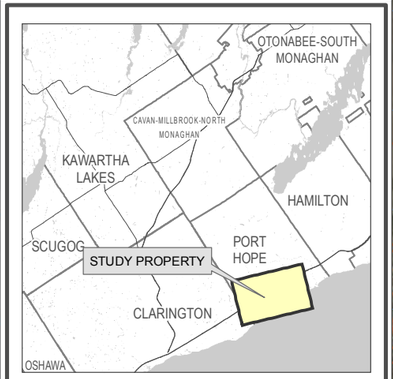

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FIGURE 1: LOCATION OF PROJECT & STUDY AREA

17N 709253 4869455
Revision 1
10-066
HOPE TOWNSHIP
PETERBOROUGH DISTRICT

1 centimeter = 300 meters

Meters
0 412.5 825 1,650

LEGEND

Project Specific
- Project Location
- Study Area

Municipal
- Lot Parcel

Natural Features within 120m of Project Location

Wetland Wetland Area WE01- 82m

Woodlot Due to the amount of features, please refer to the report. Not all distances can be shown on map.

Corridor Potentially within project location and 120m project zone.

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1.2 Construction

The construction activities of the proposed solar energy facility will include laneway construction, installation of panels, racking, foundations and collection houses and electrical work. The construction and installation will be completed in one phase and will take approximately 6 months. Construction is expected to commence in spring or summer.

To facilitate the installation of racking, modules, and other REGF components, minor grading of the site may be necessary. The majority of the project area is currently comprised of agricultural lands, and as such, major site preparation such as clearing and grading will be greatly reduced in scope. A summary of anticipated construction activities appears in Table 1.

No solid, liquid or gaseous wastes will be generated and there is no anticipated change to the water flow on site. No toxic or hazardous materials will be used or generated and thus no disposal procedures are required. The REA regulation requires the preparation of a construction plan report, which Penn anticipates will be submitted as part of its REA application.

1.3 Operation

Once construction and installation is complete, regular light maintenance is required which will consist of site visits to inspect electrical and non-electrical components and conduct minor site maintenance. Since maintenance is on an as-needed basis, no permanent on-site personnel are required for daily operations. Such maintenance would also include regular mowing, as frequently as weekly, within the facility and the landscaped areas outside the perimeter fence along the southern boundary. An area that is a maximum of 5 m wide on the outside of the perimeter fence on the western, northern and eastern boundaries will also be mowed regularly to ensure that no woody vegetation would become established where it could cause damage to the fence or shade the solar modules. Additional visits will occur as necessary to maintain the solar components. Table 1 summarizes the operation activities. It is anticipated that the solar facility will generate electricity year round during the daylight hours.

1.4 Decommissioning

The installed components have almost no long-term or permanent impact on the site. Panels, racking, cabling, collection houses, and other equipment can be removed after they have fulfilled their life expectancy of 20-30 years. Following decommissioning the Facility site will be restored, to the extent possible, to pre-Facility conditions in accordance with local land use laws or regulations and pursuant to the landowner's desires. It is not anticipated that construction, operation or decommissioning of the Facility will have any negative or permanent effects on natural features within the study area.

Table 1: Summary of construction, operation and decommissioning activities

Phase	Activity	Description of Activity	Anticipated Duration and Timing
Construction	Access road construction	• Clearing and grubbing of upland areas within project location boundary. • Stripping and removing topsoil • Minor Grading, if required • Compaction of soil and re-vegetation • Placement of gravel	• 120 days, Spring- Summer 2013
Construction	Installation of panels, collection houses and fence.	• Project fence meeting Ontario Energy Board safety requirements is installed around the project perimeter • Foundation of the system installed with: framing elements being driven, screwed or cored and grouted into the ground (depending on soil conditions) • Wiring is installed • Panels are installed on racking system • Connection houses and project substation installed on concrete/gravel/metal foundations	• 120 days (significant overlap with site preparation above) Spring-Summer 2013
Operation	General maintenance	• Washing/clearing of solar panels. • Inspection of electrical and non-electrical components. • Replacing panels, wiring or other components as required. • General landscape maintenance.	• Scheduled cleaning dueing the operational phase can occur approximately twice a year Spring-Fall with a work time of about two weeks per cleaning
Decommissioning	Removal of installed components	• Removal of materials and disposal off-site at an appropriate location. • Recycling or refurbishing materials wherever possible. • Site is re-vegetated or left to regenerate back to existing conditions or a condition deemed appropriate at the time.	• 120 days, work schedule Timing pursuant to Ministry of the Environment decommissioning requirements.

2.0 Identification of Potential Negative Environmental Effects and Mitigation Measures

2.1 Existing Environmental Conditions

Farm properties and undeveloped grasslands surround the property. A corridor spanning the north-west corner of the property comprised of a watercourse surrounded by wooded and wetland area. Habitat within the study area is primarily corn fields with crops changing from year to year. Communications with the current landowner (who currently farms the property) determined a section of the parcel will be planted in soy bean in 2012. Hedgerows were present bisecting the property north-south; however, the current landowner recently cleared the hedgerows in order to increase the acreage of farmable land available at the property. Residential properties and additional cropland are located to the east and west. Hwy 401 and lands owned by Ministry of Transportation are to the north, with Hwy 410 essentially forming the northern boundary of the property. Hydro One owns the property that directly abuts the subject property to the east. The adjacent lands (within 120m) contain old field meadows with some milkweed present. An ANSI exists south-west of the property; however, it is over 120 meters from the property. The site in general is fairly flat. In the northwest corner, the site begins to slope steeply down towards the watercourse.

2.2 Natural Features

A number of natural features were identified through the records review and site investigation (Figure 2 & 3). These included an unevaluated wetland and woodlands. No valleylands or ANSIs are within 120 m (or within 50 m of an ANSI-Earth Science) of the project location. Likewise, no provincial parks, conservation reserves or federal lands are located within 120 m of the project area.

As determined in the EOS, two significant natural features were identified in or within 120m of the project location. Generalized candidate significant habitat was identified within 120m of the project location and is being treated as significant. In addition, one wetland is being treated as significant, which is also located within 120meters of the project location.

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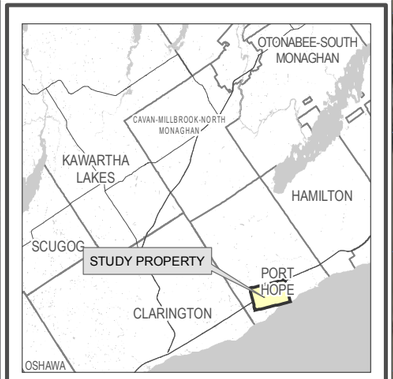

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FIGURE 2: PROJECT LOCATION & NATURAL FEATURES

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10-066

HOPE TOWNSHIP

PETERBOROUGH DISTRICT

1 centimeter = 150 meters

Meters

0 210 420 840

LEGEND

Road Classes
- Local
- Arterial
- Collector
- Expressway / Highway
- Freeway

Municipal
- Lot Parcel
- Owner Parcel

Community Types
- Wooded Area
- Wetland Pocket
- Wetland, PSW
- Wetland, Other
- ANSI
- ESA
- Possible Wildlife Corridor

Project Specific
- Project Location
- 120m Project Area
- Study Area

Natural Features within 120m of Project Location

Wetland Wetland Area WE01- 82m

Woodlot Due to the amount of features, please refer to the report. Not all distances can be shown on map.

Corridor Potentially within project location and 120m project zone.

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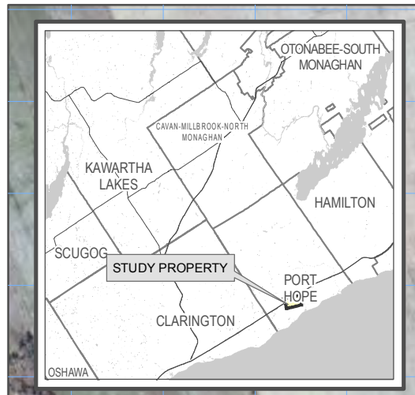

FIGURE 3: NATURAL FEATURES & COMMUNITIES

17N 709253 4869455
Revision 3

10-066
HOPE TOWNSHIP
PETERBOROUGH DISTRICT

1 centimeter = 65 meters

Meters
0 90 180 360

LEGEND

Road Classes
- Local
- Arterial
- Collector
- Expressway / Highway
- Freeway

Municipal
- Lot Parcel
- Owner Parcel

Community Types
- Wetland Community
- Wooded Community
- Significant Community

Project Specific
- Study Property
- 120m Project Area

Community Types Descriptions

WE01	(MAS2-1)	Cattail Mineral Shallow Marsh Type
	(MAS2-9)	Forb Mineral Shallow Marsh Type
WO01	(FOD5-1)	Dry-Fresh Sugar Maple Deciduous Forest Type
WO02	(FOM)	Mixed Forest
	(FOD8-1)	Fresh-Moist Deciduous Forest Type
	(FOC4-1)	Fresh-Moist Cedar Coniferous Forest Type
WO03	(FOM)	Mixed Forest
WO04	(FOC1)	Fry-Fresh Pine Coniferous Forest Ecosite
WO05	(FOC1)	Fry-Fresh Pine Coniferous Forest Ecosite
WO06	(FOC1)	Fry-Fresh Pine Coniferous Forest Ecosite
WO07	(FOC1)	Fry-Fresh Pine Coniferous Forest Ecosite
WO08	(FOM)	Mixed Forest
WO09	(FOM)	Mixed Forest

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2.3 Potential Negative Environmental Effects and Mitigation Measures

2.3.1 Generalized Candidate Significant Wildlife Habitat

Table 2 outlines the potential negative environmental effects the project activities may have on the generalize candidate significant wildlife habitat. Proposed mitigation measures and monitoring if required are outlined below.

2.3.2 Unevaluated Wetland (WE-01)

As WE-01 was treated as significant based on Appendix C in the NHAG, the potential negative environmental effects for each of the wetland characteristics and functions as well as the mitigation will be discussed in Table 3. Refer to Table 5 of the EOS (NEA, 2012) for complete analysis of wetland characteristics and functions for WE-01.

Table 2. Summary of potential negative effects and proposed mitigation measures for generalized candidate significant wildlife habitat

Component & Activities within 120m	Distance to Nearest Project Component	Potential Negative Effects to General Wildlife Habitat	Mitigation Measures	Performance Objectives, Monitoring, and Contingency Plan
-vegetation removal	<1m	-sedimentation and erosion -reduction in groundwater Recharge/changed hydrological flows	-use native species in re-stabilization seed mix -allow mowing outside of the project location boundary and outside of set-backs only every second year in the fall to minimize tree and shrub growth around the perimeter -Protect WO02 for its function of protecting the nearby wetland/water feature from project activities -retain trees where possible	No effects to habitat from construction
-noise/human activities	<1m	-disturbance/mortality of species	-minimize noise/activity by conducting construction activities in the daytime where possible and utilizing stock mufflers on construction equipment -implement dust suppression when necessary	No effects to habitat from noise and human activities

Component & Activities within 120m	Distance to Nearest Project Component	Potential Negative Effects to General Wildlife Habitat	Mitigation Measures	Performance Objectives, Monitoring, and Contingency plan
-grading	<1m	-reduced stability of landforms -increased soil compaction -changes in natural drainage	-minimize changes in land contours -maintain existing hydrological regime	No effects to habitat from grading
-roads	<1m	-increased input of nutrients and contaminants to wetlands	-construct roads of impervious surfaces which promote infiltration (e.g.., gravel)	No effects to habitat from the construction of roads

Table 3. Potential negative effects and mitigation measures required for each wetland characteristic and function

Wetland Characteristic and/or Function	Potential Negative Effect	Mitigation Measures to Protect Wetland Characteristics and Functions
Size (0.19 ha)	--high risk of contamination or sedimentation due to its small size	Install silt fencing at the project location boundary in the vicinity of the wetlands to protect the wetlands' features and functions
Wetland Type (marsh)	-high risk for invasive species entering due to its early successional stage (marsh)	-use only native species when re-vegetating project location
Site Type (isolated)	An isolated wetlands water quality is highly depended on its contributing water source (mainly tributary and groundwater). There is potential for the water quality to be affected	-protect water source by implementing a 30m buffer around the wetland and tributary (Figure 4)
Vegetation Communities	-loss of biodiversity	-Install silt fencing at the project location in the vicinity of the wetland to protect the biodiversity of the wetland -use only native species when re-vegetating project location
Proximity to other Wetlands	None; next nearest wetland is located 900m away and wildlife would likely not travel this far for such a small wetland with little value, no wildlife species were observed within the wetland including amphibians and turtles.	None
Interspersion	None; low interspersion, only one vegetation community exists therefore this wetland does not provide more than one habitat type	None

Wetland Characteristic and/or Function	Potential Negative Effect	Mitigation Measures to protect Wetland Characteristics and Functions
Open Water Types	None; no open water communities were a part of this wetland	None
Flood Attenuation	-potential to affect flood attenuation as isolated wetlands provide valuable flood attenuation	-Implement a 30m setback from WE-01 to protect its ability to provide flood attenuation within the area.
Water Quality Improvement	-WE-01 position in the landscape allows it to provide good water quality improvement, there is potential for this to be affected	-Implement a 30m setback from WE-01 to protect its ability to provide water quality improvements. Design to follow existing topography where possible to minimize changes in runoff rates
Shoreline Erosion Control	None; no shoreline is associated with this wetland	None
Groundwater Recharge	Potential for ground water recharge to be affected	Implement a 30m setback from WE-01 to protect its ability to provide water quality improvements.
Species Rarity	None; no rare species were found within the wetland or adjacent to it	None
Significant Features and Habitats	None; no significant features and/or habitats were found within the wetland or adjacent to it	None
Fish Habitat	None; no fish habitat was found within the wetland	None

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FIGURE 4: SITE FACILITIES & CONSTRAINTS

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Revision 4

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HOPE TOWNSHIP

PETERBOROUGH DISTRICT

1 centimeter = 65 meters

Meters

0 90 180 360

LEGEND

Plan
- Proposed Solar Array
- Proposed Road

Road Classes
- Local
- Arterial
- Collector
- Expressway / Highway
- Freeway

Municipal
- Lot Parcel
- Owner Parcel

Community Types
- Vegetation Community
- Significant Community

Project Specific
- Study Property
- 120m Project Area
- Drainage (NEA)
- 30m Buffer

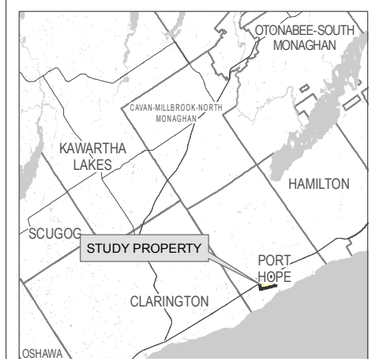

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Table 4: Summary of potential negative effects and proposed mitigation measures for significant features

Feature Type/ID	Project Phase & Activity within 120 m of the feature	Distance between Feature and all Project Components within 120 of it	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Generalized Candidate Significant Wildlife Habitat	Construction-fence and road	<1m (project location)	Loss of habitat	-Use native species in re-vegetative seed mix -Install silt fencing at the project location in the vicinity of the habitat to limit encroaching project activities on the field meadows -Allow no construction activities or staging areas within field meadow communities -Area between project location boundary and WO02 will be left to regenerate, mowing is permitted every second year in late fall to prevent shrubs and trees from encroaching. -Protect WO02 -Retain trees where possible -minimize noise/activity -implement dust suppression when necessary -minimize changes in land contours -maintain existing hydrological regime -construct roads of impervious surfaces which promote infiltration (e.g., gravel)	-to prevent encroachment of project activities into habitat -Increase potential habitat within the area

Feature Type/ID	Project Phase & Activity within 120 m of the feature	Distance between Feature and all Project Components within 120 of it	Potential Negative Effects to the Feature	Mitigation Measures	Performance Objectives, Monitoring and Contingency Plans
Wetland WE-01	Construction- fence and road	82m	-loss of biological diversity -increase or decrease in water quantities to wetland --high risk of contamination or sedimentation - risk for invasive species entering -potential for water quality to be affected - potential to affect flood attenuation - Potential for ground water recharge to be affected	-Install silt fencing at the project location in the vicinity of the wetland to limit encroaching project activities into the adjacent communities -Protect WO02 as it acts as a natural vegetative buffer to WE01 - Design to follow existing topography where possible to limit changes in runoff rates -Implement a 30 m buffer wetland WE-01	- prevent encroachment of project activities within buffers established for the wetland -minimize changes in runoff rates -Protect natural buffers adjacent WE01

3.0 Conclusion

The solar panel energy facility will not have a significant negative impact on the generalized candidate significant wildlife habitat or the wetland (WE-01) as long as the mitigation measures and recommended setbacks are implemented, as mentioned throughout the Environmental Impact Study. No specific monitoring measures or plan are required.

4.0 References

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