PROJECT DESCRIPTION REPORT (PDR)

[The numbers in brackets refer to sub-sections of Technical Guide to Renewable Energy Approvals (2011)]

13 August 2010
Last Revised – 9 December, 2013

Section 1 – General Project Information and Contacts

Project Name [3.1]	**Penn Energy–Van Dorp**
Project Description [3.3]	10,000 kW Solar PV Renewable Energy Generation Facility (the "REGF")
Project Location [3.2]	Southwest corner of Highway 401 and Wesleyville/Morrish Church Road in the Municipality of Port Hope in the County of Northumberland, Province of Ontario
OPA FIT Application No.	FIT-FLTV77L
Applicant [3.1]	Penn Energy Renewables, Ltd. 1 Yonge Street, Suite 1801, Toronto, ON M5E 1W7
Project Contact [3.4]	Max Frable Max@PennEnergyRenewables.com Penn Energy Renewables, Ltd. 620 Righters Ferry Road, Bala Cynwyd, PA, USA 19004 Office: 610-668-0300 x1007 Fax: 610-668-0365

Section 2 – Are Any Related Authorizations Required?

Conservation Authority (CA) [3.5]	None, Ganaraska Region Conservation Authority consulted with no permit required as the project has been sited to be outside of regulated areas. *See Section 4 for more details.*
Ministry of Natural Resources (MNR) [3.5]	NHA confirmation required and received from MNR. *See Section 4 for more details.*
Ministry of Tourism & Culture (MTC) [3.5]	Concurrence required and received from MTC. *See Section 4 for more details.*
Ministry of Transportation (MTO) [3.5]	Possibly; the property is within an MTO Permit Control Area because it is adjacent to an MTO-jurisdiction roadway (Hwy. 401). Initial conversations with MTO suggests that their primary concerns are related to coordinating the location(s) of vehicular access to our site and ensuring stormwater drainage does not negatively impact their property. We will continue our coordination efforts with the MTO throughout the design and engineering process.
Federal Involvement: [3.6]	
Canadian Environmental Assessment Agency (CEAA)	No federal authority is the proponent of the project or providing financial assistance to the proponent; no federal lands are being sold, leased or otherwise disposed; no requirement for a federal permit, license or other approval is

	anticipated at this point in time.
Pending or Decided Federal Environmental Assessments (EA)	It does not appear as if there are any pending or decided Federal Environmental Assessments pertaining to this site.
Fisheries & Oceans Canada (DFO) *Fish and Fish Habitat impacts requiring review beyond local CA; Fisheries Act authorization; or under jurisdiction of Canadian Environmental Assessment Act (CEAA), or Species at Risk Act (SARA)*	A small stream crosses the far NW corner of the site and this is the only portion of the site that lies within the Ganaraska Region Conservation Authority's Regulated Area. Because no work is proposed within these limits, the GRCA has informed Penn that no permits are necessary.
Environment Canada *Migratory Birds and/or Habitat*	No negative impact to migratory birds and/or their habitat is anticipated. *See Section 4 for more details.*
Parks Canada *Federal Lands owned by Parks Canada*	The REGF does not occur on or over federal land owned by Parks Canada. It does not appear that there are any National Historic Sites nearby. Further, it does not appear that there any other national parks, reserves, historic sites, historic canals or national marine conservation areas nearby that will be affected by the REGF.
Natural Resources Canada (NRCan) *Funding assistance*	No funding is being sought from NRCan for this project.

Section 3 – Specific Project Information

Facility Class [3.3]	**Class 3 Solar PV** (Ground-mounted, >10 kW)
Nameplate Capacity [4.1]	**10,000 kW** (AC)
Energy/Fuel Sources [3.3]	The Sun. (No fuel or raw material is required; no by-products, waste or pollution are generated during the process.)
Electricity Generation Components [4.1] *Since supplier contracts remain to be finalized, this information is subject to change. We anticipate components will not substantially differ from those listed herein.* [1 mW (AC) = approx. 5,500 panels]	A single photovoltaic (PV) *module* is approximately 3 ft. x 5 ft. and consists of numerous crystalline-silicon *cells* arranged in a grid and laminated between electrodes and enclosed within a glass and aluminum frame. Modules are grouped into *arrays* (8-24 each) which are aligned in long rows; the rows are separated by access aisles, approximately 12 ft. in width. The *array field* ("project area") for this site will consist of approximately 55,000 PV modules and will include 6-10 modular *collection houses* that contain inverters and transformers. Power generated by PV modules is low-voltage, direct current (DC) and will be collected and converted into alternating current (AC) by *inverters* located inside small modular structures throughout the array field. The AC power flows through a *transformer* to increase its voltage to match the local electricity distribution system (typically 44 kV or 27.6 kV). Metering and safety equipment is required and allows the distribution/transmission operators to remotely control the power grid interconnection to ensure safe and reliable operation – especially during power outages and disruptions.
Associated Facilities/Equipment [4.1]	The entire project area will be enclosed with a security/safety fence; a perimeter driveway will be located adjacent to (inside) the fence; additional driveways will pass through the array field and provide access to the collection houses. Collection and distribution lines (i.e. "transmission") will consist of underground and/or overhead lines and will connect to the power grid at a nearby distribution line. No office buildings are proposed; neither natural gas, nor water nor sanitary sewer service are required and no water crossings anticipated.
Project Activities: [4.2]	
Describe any regulated activities (construction, installation, use,	The solar module arrays will be mounted on a series of metal framing elements

operation, changing and retiring)	that are sloped (facing south) to maximize exposure to the sun (maximum height is approximately 4 meters above the ground). The foundation system consists of similar framing elements that are pile-driven, screwed, or cored-and-grouted into the ground (depending upon existing soil conditions). As mentioned above, a network of driveways surrounds the project area and provides access throughout the array field and to all the collection houses. (Only minor re-grading and is anticipated.) Indigenous grasses/groundcover will grow beneath and between the rows of solar arrays, which will minimize erosion and enhance infiltration of precipitation into the soil. Because there are gaps between the modules and between the arrays, rain and snow-melt passes through – instead of being collected across a very large plane and concentrated at the low-spot (like on a building's roof). Therefore little, if any, impact to the existing natural storm-water drainage is anticipated. Besides construction of driveways, installation of panels, framing, foundations and the collection houses, the remaining work is mostly electrical (collection lines, inverters, transformers, etc.). Once construction & installation is complete (including testing and commercial operation initiation), very little maintenance is required. The site will normally be uninhabited. Occasional site visits will be conducted for minor site maintenance and inspection of electrical and non-electrical components. Additional visits will occur as necessary (e.g. to replace panels, wiring or other components). One extremely beneficial characteristic of this project is the installed components have almost no long-term or permanent impact on the site. In fact, they can all be removed after the solar panels have fulfilled their life-expectancy (20-30 years) and the site can virtually be returned to its natural state – very much as it exists today. This means the site could again be utilized for agricultural purposes or any other use deemed appropriate at that time. (Very little evidence, if any, that a solar farm ever existed would remain.)
Describe facility phases and timing / scheduling of each phase (e.g. time of year, frequency and duration)	The REGF will ideally be constructed & installed in one phase; anticipated duration is approximately 6 months and will likely commence in Spring or Summer.
Identify the nature of any solid, liquid or gaseous wastes, air and noise emissions likely to be generated; describe plans to manage any wastes	No solid, liquid or gaseous wastes, nor air emissions will be generated by the REGF. Minimal noise will be emitted from electrical conversion equipment (inverters and transformers), and an acoustic assessment will be conducted according to REA requirements in O.Reg. 359/09.
Describe disposal procedures for any toxic or hazardous materials to be used or byproducts to be generated	No toxic or hazardous materials will be used or generated, so disposal procedures are unnecessary.
Describe sewage and stormwater management	No sewage will be generated. Rain and snow-melt will be absorbed into topsoil at or near location it reaches the ground – very similarly to existing, undeveloped conditions; the exception is along interior driveways that should be constructed with pervious materials (e.g. gravel, aggregate, dirt) but will require minimal compaction for occasional vehicular traffic.
Describe any water-taking activity	Penn will utilize an existing well onsite for water necessary during construction activity and equipment cleaning. Use is not expected to exceed 30,240 litres per day at a seldom reached peak usage level. According to a Hydrogeological Impact Statement prepared by Levac Robichaud Leclerc Associates Ltd, dated February 2012, "the proposed water taking operation described above is expected to have no significant impacts on the local hydrogeological regime, including interference with neighbouring wells (dug or drilled), and land uses as well as any local surface water features.".

Land Ownership [4.4]	THE REGF site is privately owned (no Crown or Federal lands involved)
Legal description [4.4]	PL LT 23-24 CON 2 HOPE PT 1-6, 9R2113; PORT HOPE

Section 4 – Potential (Negative) Environmental Effects

Cultural Heritage and Archeological Resources (MTC) [5.1]	None. A Stage 1-2 Archaeological Assessment has been performed by Northeastern Archaeological, Ltd. with the recommendation for complete clearance of the property. MTC has concurred with these recommendations in a letter dated August 29, 2011. A Cultural Heritage Screening has also been completed by Unterman McPhail Associates finding no Protected Properties abutting on the Project Location. These studies will be included in the complete REA application to the Ministry of the Environment.
Natural Heritage (MNR) [5.2] *Woodlots, valleylands, wildlife habitat, provincial parks, conservation areas & reserves, flora/fauna species of concern & habitat, protected natural areas (e.g. ANSI), and locally important or valued ecosystems or vegetation…within 300m of RE project*	The REGF is not located within 120m of a Provincial Park or Conservation Reserve. REGF is not within 50m of ANSI-earth science. Natural features found onsite by an NHA report and Environmental Impact Study completed by Niblett Environmental Associates, Inc. found no natural features within the project location and two significant natural features within 120m. These include generalized significant wildlife habitat along the north of the project location boundary and a wetland feature to the northwest. These findings have been confirmed by MNR. Mitigation measures to avoid impact to these features are details in the Environmental Impact Study, Construction Plan Report, Design and Operations Report and Decommissioning Report.
Water Bodies (CA, MNR) [5.3]	There are two water bodies on the site - a small stream that crosses the far NW corner of the property near Highway 401 and a drainage ditch at the northern boundary of the site also near 401. The REGF design was modified avoid these areas. Because this is the only portion of the site that lies within the Ganaraska Region Conservation Authority's Regulated Area and no work is proposed within the R.A. limits, the GRCA has informed Penn in a letter dated October 20, 2011 that no permits are necessary if the NW watercourse channel is not altered. A Water Bodies Report has been prepared and will be submitted to MOE for review.
Air, Odour, Dust [5.4]	No odors or dust emissions are produced from the solar power generation process.
Noise [5.5]	Minimal sound is emitted by the solar power generation process. The panels, racking and wiring – which comprise the majority of the REGF – produce virtually no sound. The inverter and transformer, however, do produce some noise – which will be studied in accordance with O.Reg. 359/09. It is anticipated that the prescribed noise limits will be adhered to via careful siting of the suspect equipment adequately distanced from any receptors.
Land Uses [5.6] (past & present; onsite & nearby)	The site is currently zoned Prestige Industrial/Commercial. Its current land use is categorized as Employment General. The site is currently used for agricultural purposes. The site is bordered on the north by Highway 401, to the east by Wesleyville/Morrish Church Road, to the south by Mail Road and to the west by predominately development land a portion of which is slated for potential development by Cameco. No negative effects on the current land use or resource availability are anticipated. The proposed REGF site is predominately undeveloped.
Provincial & Local Infrastructure [5.6]	No negative environmental effect is anticipated on provincial and local services and infrastructure. The REGF requires no water, sewer or gas services. While there will be a temporary increase of truck traffic on local roads during the few months of construction, there will be almost no traffic generated by this REGF

	once construction is complete.
Livestock Impacts [5.6]	Per Ontario Energy Board standards, the project perimeter will be fenced limiting potential for livestock to enter the facility
Public Health & Safety [5.8]	No negative environmental effect on public health and safety is anticipated. In fact, there are numerous benefits provided by generating solar power, which is why the provincial government is encouraging it. The facility will be surrounded by a fence for safety and security.
Provincial Plan Areas [5.9] *(Greenbelt, Oak Ridge Moraine, Niagara Escarpment, Lake Simcoe Watershed)*	Not Applicable, since it does not appear that the REGF project is within any known PPA.

Section 5 – Project Location Map