



Environmental Protection Plan

for the
St. Lawrence 27 MW Wind Energy Project

Submitted to:

Government of Newfoundland and Labrador
Department of Environment and Conservation
Environmental Assessment Division

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Table of Contents

Section 1	Introduction.....	1
1.1	Purpose of the EPP.....	1
1.2	Objectives.....	1
1.3	Organization	2
1.4	Project Description.....	2
1.4.1	Access.....	2
1.4.2	Laydown and Marshalling Areas	2
1.4.3	Soil Storage.....	3
1.4.4	Wind Turbine Generators	3
1.4.5	Transmission Line and Interconnection.....	3
1.4.6	Project Substation	3
1.4.7	Accommodations	3
1.5	Turnkey Contractor Responsibilities.....	6
1.6	Environmental Orientation.....	7
Section 2	Environmental Concerns	8
2.1	Construction	8
2.2	Operations.....	8
2.3	Decommissioning.....	8
Section 3	General Environmental Protection Measures.....	9
3.1	Surveying	10
3.2	Vegetation Clearing and Disposal	11
3.3	Grubbing, Stripping and Materials Excavation	13
3.4	Disposal of Excavated Material	15
3.5	Stream Crossing.....	16
3.6	Linear Developments	19
3.7	Ditching	21
3.8	Infilling and Grading	22
3.9	Dewatering	23
3.10	Construction Equipment Use and Maintenance	24
3.11	Heavy Equipment Movement On Site	25
3.12	Dust Control	26
3.13	Sewage and Solid Waste Disposal	27
3.14	Storage, Handling and Transfer of Fuels and Other Hazardous Materials	28
3.15	Light and Noise Levels.....	31
3.16	Vehicle Traffic.....	32
3.17	Blasting.....	33
3.18	Quarrying and Aggregate Removal.....	35
3.19	Concrete Production/Placement.....	37
3.20	Marshalling and Storage Areas	38

3.21	Avoidance of Migratory Birds and Wildlife	39
3.22	Pumps and Generators	41
Section 4	Environmental Monitoring	42
4.1	Construction	42
4.2	Operation	43
4.3	Contingency Plans	44
4.4	Fuel and Hazardous Material Spill	45
4.5	Wildlife Encounters	48
4.6	Discovery of Historic Resources	49
4.7	Fire	51
Section 5	Permits, Approvals and Authorization	52
Section 6	Cited References	54
Section 7	Contacts List	55



Section 1 Introduction

1.1 PURPOSE OF THE EPP

Environmental protection planning is an important component of overall project planning and implementation on construction sites. Environmental Protection Plans (EPPs) provide a practical way in which a developer can ensure adherence to environmental regulations, practices and procedures required to minimize or eliminate potential environmental impacts as a result of a project.

The NeWind Group Inc. (Owner) through the St. Lawrence 27 MW Wind Energy Project (Project) has committed in the St. Lawrence Wind Project Environmental Impact Statement to the development and implementation of a comprehensive EPP to ensure a high level of environmental protection throughout the Project at the Town of St. Lawrence in Newfoundland's Burin Peninsula. An EPP is a working document for use in the field for Project personnel as well as at the corporate level for ensuring commitments made in policy statements are implemented and monitored. This EPP provides a quick reference for Project personnel and regulators to monitor compliance and to make suggestions for improvements.

1.2 OBJECTIVES

The objectives of the EPP are to:

- ensure that commitments to minimize environmental impacts will be met;
- provide a reference to applicable legislative requirements;
- document environmental concerns and appropriate protection measures;
- provide concise and clear instructions to Project personnel regarding procedures for protecting the environment and minimizing environmental impacts
- communicate changes in the program through the revision process.

In meeting these objectives, the Owner intends to ensure 'due diligence' with regard to environmental protection. Also, this document will serve to designate responsibility for environmental protection.

The information presented in the EPP was developed based on information collected by the Owner during the development stage of the Project as well as by fieldwork undertaken by Jacques Whitford Limited, who also served as a reviewer of this document. The Project was



released from the environmental assessment process in 2002 by the Government of Newfoundland and Labrador Minister of Environment and Conservation.

1.3 ORGANIZATION

The activities related to the construction of the Project can be divided into three categories: civil works, electrical works and wind turbine generator erection. Civil works includes the construction of access roads, wind turbine foundations and a control building. The electrical work consists of a new substation, above and below ground electrical collector lines and the connection to the nearby Laurentian Substation. The wind turbine generator construction involves the transportation, assembly, erection and commissioning of the wind turbine generators.

1.4 PROJECT DESCRIPTION

The Project is located about 3 kilometres north of the Town of St. Lawrence in the southern portion of the Burin Peninsula on the Island of Newfoundland. The Project will consist of nine Vestas V-90 3.0 MW wind turbine generators for a total generating capacity of 27 MW. A preliminary site plan showing the major Project components is provided in Figure 1. Civil works construction shall begin in spring 2007, turbine erection in summer 2008 and project commissioning in fall 2008.

1.4.1 Access

An access road made of excavated fill material shall be constructed that will lead to each of the wind turbine generator foundations. Efforts shall be used to recuperate fill material from the site construction as much as is possible. A turnoff from the nearby Highway 220 to the Project site shall be made. The access road will be approximately 10 meters in width and about 6 kilometres in length designed to support the weight loads of the Project construction equipment. At the time of the preparation of this EPP the location of the access road is such that there will not be any stream crossings. A section outlining stream crossings is included in this report in the event that stream crossings are required.

1.4.2 Laydown and Marshalling Areas

A Project laydown and marshalling area will also be built near the location of the Project substation. This area is to serve as a vehicle staging and command area for the construction activities. The laydown area shall be composed of the same fill material as the access road and will be about 100 meters by 100 meters in size.



1.4.3 Soil Storage

The Project construction shall have the potential to temporarily displace soil. Any soil displaced shall be stored on site, and all efforts shall be used to incorporate it into the construction of the access roads and laydown area. Any excess material shall be saved for site remediation activities following construction. Soil shall be placed away from any watercourses or sensitive areas.

1.4.4 Wind Turbine Generators

A total of nine (9) Vestas V-90 3.0 MW wind turbine generators shall be erected at the Project site. Each wind turbine generator will be composed of: one tubular tower, one nacelle, one hub and three blades. The towers will be fabricated of steel and delivered to the site in four sections each 20 meters in length. The nacelle will be at height of 80 meters a.g.l. and shall be equipped with aircraft obstruction lighting as well as wind turbine control sensors. The hub serves as the connection point for the three blades and the nacelle. The wind turbine blades are each 45 meters in length. When in operation, the wind turbine generator blade tips at the point of their upper-most rotation will be 125 meters a.g.l.

1.4.5 Transmission Line and Interconnection

Two overhead transmission line systems will be constructed for the Project; one at a voltage of 25 kV and a second at 66 kV. The 25 kV transmission line will start at the base of each wind turbine generator and travel underground for 350 meters where each line emerges aboveground to an overhead collector system. The transmission line support poles will be of in a "T" shape and made of wood. The 25 kV system connects to the Project substation where the voltage is increased to 66 kV and transferred using the second transmission system again by overhead lines to the existing Newfoundland Power Laurentian substation. The poles will be in an "H" shape and made of wood.

1.4.6 Project Substation

A Project substation will be constructed for the Project. The foundation will be a monolithic concrete structure. The surface will be covered with crushed gravel. The Project substation equipment shall be a transformer, equipment and line support structures, windfarm SCADA control system and a heated control station. The whole Project substation shall be secured with chain link fence and locked at all times. All electrical equipment is to be installed and operated according to the applicable provincial and national safety standards.

1.4.7 Accommodations

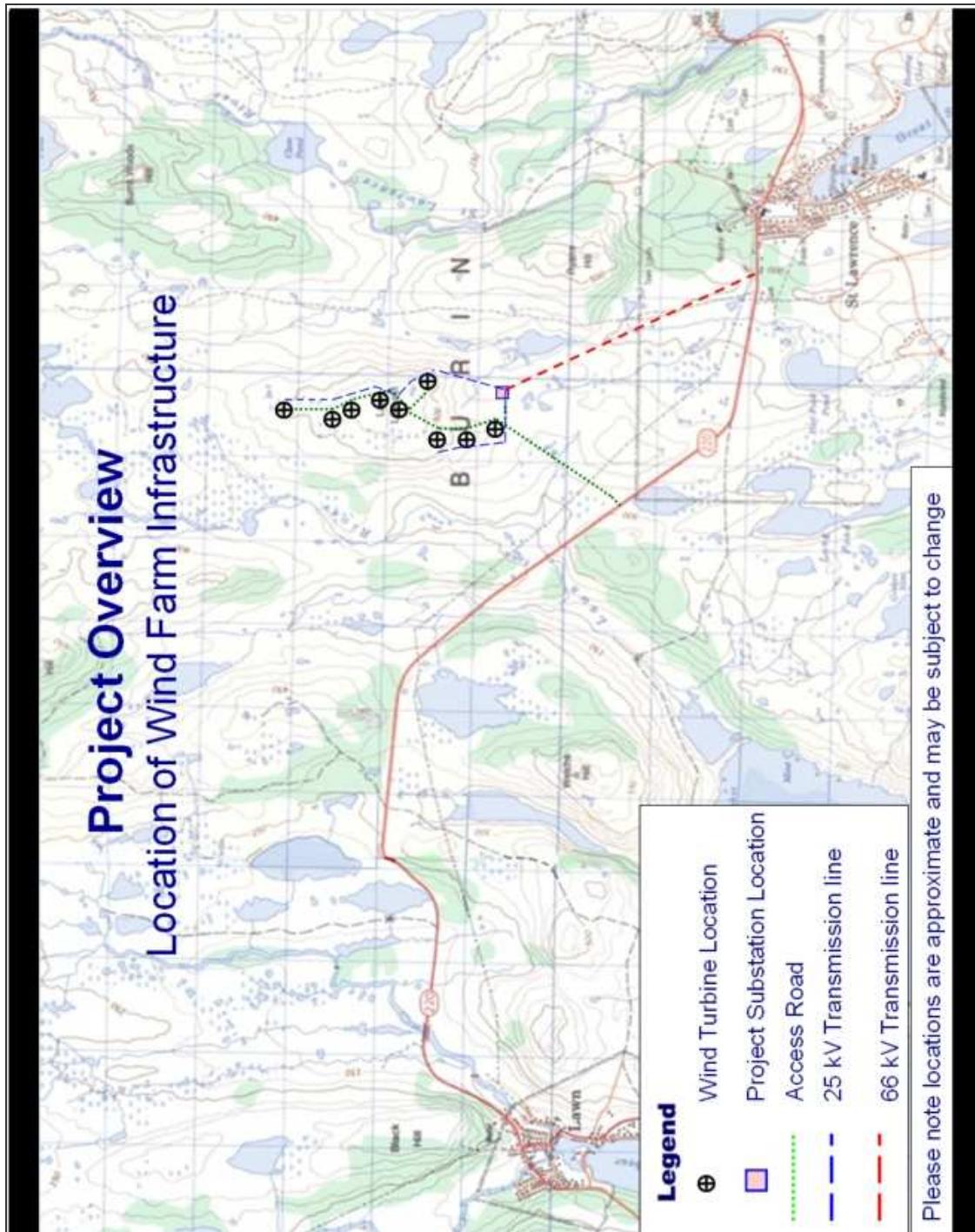
During construction living accommodations may be required for construction workers for the



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Project. Those workers shall be housed in existing lodging found in St. Lawrence and in the southern Burin area with no temporary structures for that purpose being constructed at the Project site.

Figure 1 Preliminary Site Plan St. Lawrence 27 MW Wind Energy Project





1.5 TURNKEY CONTRACTOR RESPONSIBILITIES

The Owner is committed to protect the environment in the areas where Work is conducted as well as related off-site areas, that is, down gradient and downwind. To ensure protection of the environment, the Work at all times shall be subject to inspection by the Owner and municipal, provincial and federal government agencies with jurisdiction.

For the construction of the Project, the Owner will be using a Turnkey Contractor to coordinate and undertake the construction activities, whereas the operation of the Project shall be the responsibility of the Owner. This EPP delegates responsibility to either the Owner or Turnkey Contractor, however it is ultimately the responsibility of the Owner that all practices are followed and respected.

Owner's and Turnkey Contractor's Responsibilities

- a) The Turnkey Contractor shall ensure that its employees and those of its subcontractors and sub-subcontractor and agents and vendors comply with all of the requirements of the Turnkey Contract and with all applicable environmental laws, regulations, permits and requirements of federal, provincial and municipal authorities.
- b) The Owner and the Turnkey Contractor shall obtain all the required permits (approvals, and authorizations) for the construction of the Project. Copies of all certificates and approvals acquired by the Turnkey Contractor shall be provided to the Owner in a timely manner, and copies are to be available and/or posted on-site as appropriate or required.
- c) The Turnkey Contractor shall identify and obtain required permits to establish and/or use a Waste Disposal Area for garbage disposal. If the Turnkey Contractor establishes a Waste Disposal Area for use during construction, the Turnkey Contractor shall decommission and close the Waste Disposal Area in accordance with the Schedule A of the *Environmental Control Water and Sewage Regulations, 2003* under the *Water Resources Act* prior to Final Completion of the Work.

Environmental Effects Monitoring programs have been committed to in the St. Lawrence Wind Project Environmental Impact Statement (EIS) and shall be implemented by the Owner in consultation with the appropriate regulatory authorities. Monitoring programs as conditions of permits, approvals or authorizations issued to the Turnkey Contractor shall be implemented by the Turnkey Contractor.

Owner's and Turnkey Contractor's Personnel

- d) All government laws, regulations and rules pertaining to fish and wildlife (e.g., feeding and harassment of wildlife), fires, travel, smoking and littering shall be complied with by the Turnkey Contractor and its employees, its Subcontractors and Sub-



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subcontractors, vendors and agents. There shall be no hunting, trapping or shooting on the Project Site.

- e) The Turnkey Contractor and its employees, its Subcontractors and Sub-subcontractors, vendors and agents shall not have firearms on the Project Site, other than a sealed unit under the supervision of the Turnkey Contractor's On-Site Supervisor, for use in the control of nuisance animals.
- f) Any contravention of laws and environmental requirements by the Turnkey Contractor and its employees, Subcontractors, Sub-subcontractors, vendors or agents, accidental or otherwise, resulting in environmental damage shall be reported to the Owner immediately and/or the appropriate agency with jurisdiction in the matter within the time period as stipulated in this EPP. The Turnkey Contractor shall report any incident to the appropriate authorities. The Turnkey Contractor shall be responsible for clean-up, reclamation or other restorative measures as may be directed by the Owner, or provincial or federal government agencies.
- g) All construction work shall be conducted in compliance with the Occupational Health and Safety Act and its regulations. All mobile equipment shall be fitted with roll-over protective structures according to the Occupational Health and Safety Regulations.
- h) All workers shall utilize Personal Protective Equipment (PPE) appropriate to the duties being performed.
- i) All workers working at an elevation greater than 3.05 metres above grade or floor level shall wear a fall prevention system that is in accordance with the current standards of the Canadian Standards Association (C.S.A.) Code.

1.6 ENVIRONMENTAL ORIENTATION

The Owner is committed to an active environmental orientation and ongoing environmental awareness program throughout the construction and operation of the Project. The Turnkey Contractors shall provide all workers with an environmental orientation prior to initiating work on the Project. These orientation sessions are to keep all those involved in the Project aware of the Project environmental requirements.



Section 2 Environmental Concerns

2.1 CONSTRUCTION

Construction is scheduled to begin in spring 2007 and be completed by late fall of 2008. The site development includes a variety of construction procedures such as clearing, vegetation removal and disposal, excavation and Site restoration. Environmental interactions related to the Site development are outlined in this section, followed by environmental protection procedures designed to reduce the potential impacts of each activity.

Construction activities can often result in a physical loss of habitat as well as negatively impact surrounding terrestrial and aquatic environments. Proper planning and implementation of measures which takes into account the environmental considerations and constraints within a given area in relation to a proposed project and its ancillary facilities are an important feature in protecting the natural environment.

This approach towards environmental management for the construction and operation of the Project by the Owner provides a framework for planners and developers to identify and proactively implement mitigative measures to guard against those activities which may negatively impact upon the surrounding environment. These environmental protection measures have been developed and shall be implemented by the Turnkey Contractor in order to limit the level of impact that this Project may have on the St. Lawrence area.

2.2 OPERATIONS

Operations are scheduled to begin in late 2008. While most of the environmental protection measures outlined under construction will also apply to operations the EPP will be updated prior to operations to ensure that appropriate issues are included and addressed as current with environmental and other regulations.

2.3 DECOMMISSIONING

The life of the Project is anticipated to be 20-25 years at which time the Owner may commit to extending the Project, decommissioning the Project, or transferring the Project to others. Decommissioning and site reclamation plans will be developed prior to the decommissioning of the Project.



Section 3 General Environmental Protection Measures

Section 3.0 provides general environmental protection procedures for activities associated with construction and operation of the Project.

All activities associated with the construction and operation of this Project are subject to the Schedule A of the *Environmental Control Water and Sewage Regulations, 2003* under the *Water Resources Act*.

- 3.1 Surveying
- 3.2 Vegetation Clearing and Disposal
- 3.3 Grubbing, Stripping and Materials Excavation
- 3.4 Disposal of Excavated Material
- 3.5 Stream Crossing
- 3.6 Linear Developments
- 3.7 Ditching
- 3.8 Infilling and Grading
- 3.9 Dewatering
- 3.10 Construction Equipment Use and Maintenance
- 3.11 Heavy Equipment Movement On Site
- 3.12 Dust Control
- 3.13 Sewage and Solid Waste Disposal
- 3.14 Storage, Handling and Transfer of Fuels and Other Hazardous materials
- 3.15 Light and Noise Levels
- 3.16 Vehicle Traffic
- 3.17 Blasting
- 3.18 Quarrying and Aggregate Removal
- 3.19 Concrete Production/Placement
- 3.20 Marshalling and Storage Areas
- 3.21 Avoidance of Migratory Birds
- 3.22 Pumps and Generators



3.1 SURVEYING

Environmental Concerns

Surveying activities may disturb wildlife species, vegetation and historic resources.

Site surveying activities will be conducted primarily on undisturbed land. The surveying activities that may be required include:

- vegetation removal
- traversing
- establishing permanent benchmarks

Environmental Protection Procedures

- a) No attempt to harass or disturb wildlife shall be made by any person.
- b) Vehicles shall yield the right-of-way to wildlife.
- c) ATV use will comply with the Motorized Snow Mobile and All-Terrain Vehicle Regulations, 1996 under the *Motorized Snow Mobile and All-Terrain Vehicle Act* and the Environmental Guidelines for Stream Crossings by All-Terrain Vehicles issued by the Department of Environment and Conservation. No ATVs are to operate in bog.
- d) Any archaeological sites and features that are encountered shall not be disturbed. Any discovered sites shall be reported to the Historic Resources Division and to the Owner (see Section 4.6).
- e) Walking in sensitive areas shall be restricted to established walking paths, if available.
- f) Permanent benchmarks should be configured (with a "T" or cap) and embedded sufficiently so as to pose no hazard to persons or animals.

3.2 VEGETATION CLEARING AND DISPOSAL

Environmental Concern

The removal of vegetation from the Project Site could potentially alter or destroy existing or potential wildlife habitat. Vegetation removal may also create the potential for increased soil erosion at the Project Site.

Vegetation clearing activities include the removal and disposal of shrubs, tuckamoor, low-lying vegetation and woody debris at the Project Site. Vegetation clearing may be required prior to access road construction, lay down areas, erection pads, transmission line pole installation and wind turbine foundation excavation.

Environmental Protection Measures

The following procedures shall be used to minimize the potential environmental effects of vegetation clearing and disposal:

- a) A cutting permit will be obtained (if required) prior to the start of any site clearing. Clearing or removal of trees will be restricted to the minimum areas needed for access, site development and transmission line interconnection.
- b) The clearing of vegetation shall be restricted to the minimum areas needed for the Project work.
- c) If the nest of any migratory bird is encountered during vegetation clearing (Section 3.22);
 - a. The nest site and neighbouring vegetation will be left undisturbed until nesting is completed,
 - b. Construction activities be minimized in the immediate area until nesting is completed,
- d) All vegetation debris shall be piled for subsequent disposal. Disposal shall occur away from wetlands/watercourses or other environmentally sensitive areas.
- e) The use of mechanical clearing methods, such as a bulldozer, shall be acceptable except where the resulting terrain disturbance and erosion will result in the loss of topsoil or the sedimentation into watercourses and water bodies.
- f) Woody debris may be disposed on Site through open burning provided it is in compliance with the *Forest Fire Regulations*, 1996 Environmental Code Practice for Open Burning. The Turnkey Contractor shall obtain a certificate of approval to burn from



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the Newfoundland and Labrador Department of Forest Resources and all conditions of this permit shall be followed by the Turnkey Contractor.

- g) At no time shall a fire be left unattended. Tires shall not be used to start or maintain fires.
- h) All activities associated with the disposal of non-woody debris are subject to the requirements of the *Waste Management Regulations, 2003* under the *Environmental Protection Act*. The Turnkey Contractor shall be responsible for acquiring all associated permits and approvals and adhere to all requirements set forth in those permits and approvals. Copies of those documents shall be provided to the Owner in a timely manner.
- i) Revegetation of any disturbed ground surface that is not part of an access road, lay down area or erection pad shall be undertaken by the Turnkey Contractor in order to prevent soil erosion. Revegetation will use locally occurring natural vegetation when possible.
- j) Where appropriate, overburden and vegetation shall be recycled and used as a weighting berm and a break against erosion along the sides of access roads and erection pads.
- k) A minimum buffer zone of natural vegetation of 15 m from the high water mark of waterbodies will be maintained around work areas where available space poses a constraint.

3.3 GRUBBING, STRIPPING AND MATERIALS EXCAVATION

Environmental Concern

These activities increase the potential for erosion due to exposed soil and associated effects of runoff containing high sediment load on nearby water quality, ecosystems and environmentally sensitive areas.

Grubbing refers to the removal of the vegetation mat and other debris, while stripping refers to the removal of topsoil. Materials excavation refers to the excavation of all other soil materials.

Environmental Protection Procedures

The following procedures shall be used to minimize the potential environmental effects of grubbing, stripping and materials excavation:

- a) Grubbing and stripping shall only be conducted where absolutely necessary.
- b) Grubbing of the organic vegetation mat and/or the upper soil horizons shall be minimized, and the vegetation mat left in place where possible.
- c) The organic vegetation mat and upper soil horizon material, which has been grubbed, shall be spread in a manner which attempts to cover exposed areas. Any surplus of such material shall be stored or stockpiled for Site rehabilitation and revegetation purposes elsewhere on the Project Site. Any topsoil encountered shall be stockpiled separately from the other overburden. The location of the stockpiles shall be recorded and accessible for future rehabilitation purposes.
- d) Grubbing shall not be carried out for a distance not to exceed 1 km ahead of the grading operations
- e) Dewatering of excavated areas shall make use of measures to minimize and control the release of sediment laden water through the use of filtration through vegetation, erosion control devices, sediment collection ponds, check dams or other devices.
- f) Measures shall be implemented to minimize and control runoff of sediment-laden water during grubbing, and the re-spreading and stockpiling of grubbed materials. Where grubbed materials are re-spread or stockpiled, as many stumps and roots as possible shall be left on the ground surface to maintain soil cohesion, to dissipate the energy of runoff, and promote natural revegetation. Erosion control measures shall be implemented in areas prone to soil loss; these measures shall include one or more of: brush cover, stone rip rap, wire mesh, settling ponds, and drainage channels.



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- g) The length of time that grubbed areas are left exposed to the natural elements shall be minimized to prevent unnecessary erosion.
- h) Grubbing activities shall be avoided in areas of high slope(s) near watercourses.
- i) During grubbing, care shall be taken to ensure that grubbed material will not be pushed into areas which are to be left undisturbed.



3.4 DISPOSAL OF EXCAVATED MATERIAL

Environmental Concerns

These activities increase the potential for erosion due to exposed soils and the associated effects of runoff containing high sediment loads on nearby water quality, aquatic ecosystems and environmentally sensitive areas.

Waste materials are generated during excavations involved with Site development and access road construction activities.

Environmental Protection Procedures

The following procedures shall be used to help minimize the potential environmental effect of the activities associated with the disposal of excavated waste materials:

- a) Where appropriate, efforts shall be made to use excavated waste for the construction of the access roads, laydown area or Project substation.
- b) Excavated waste material that is to remain in one disposal location for extended periods of time will be appropriately protected by stabilization of the material and/or perimeter sediment control.
- c) Excavated waste material shall not be disposed of in an environmentally sensitive area or near a watercourse/wetland, unless otherwise approved by the Newfoundland and Labrador Department of Environment and Conservation. The Turnkey Contractor shall obtain such approval prior to any such disposal, and shall provide a copy to the Owner in a timely manner.

3.5 STREAM CROSSING

Environmental Concerns

The environmental concerns associated with stream crossing, fording and culvert installations include direct disturbances to or mortality of fish, the loss of fish habitat resulting from sedimentation and removal of habitat and stream bank vegetation. All water bodies shall be examined on a site specific basis in order to evaluate the habitat type and species present at each stream crossing including upstream and construction.

Environmental Protection Procedures

If required, stream crossings shall be constructed in compliance with the required Culvert Approval and the Approval for Works and Undertakings Affecting Fish Habitat from NDOEC and DFO, respectively.

The following work shall be performed in such a way as to ensure that deleterious substances including, but not limited to, materials such as sediment, fresh concrete, fuel and oil do not enter watercourses and water bodies.

- a) Work shall be performed in such a way as to ensure that deleterious substances including, but not limited to, materials such as sediment, fuel and oil do not enter watercourses and water bodies.
- b) A minimum buffer of undisturbed natural vegetation (20 m from the high water mark) shall be left between the access road and the bank of any watercourse which it parallels.
- c) In those locations where culverts are required, application shall be made to NDOEC and DFO. The culverts used shall be sized to handle the 1 in 25 year return period flood and shall be constructed in accordance with the Environmental Guidelines for Culverts from the NDOEC, Water Resources Division, 1992. The following measures shall also be implemented:
 - i. Culvert(s) shall be installed in accordance with good engineering and environmental practices;
 - ii. Unless otherwise indicated, all Work shall take place in dry conditions, either by the use of cofferdams or by diverting the stream;
 - iii. Installation of cylindrical culverts shall be counter sunk only where necessary to protect fish habitat such that the culvert bottom is 1/3 the diameter below the streambed in the case of culverts less than 750 mm outside the diameter; for culverts greater than 750 mm outside diameter, the culvert bottom shall be installed a minimum of 300 mm below the streambed;



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- iv. If needed, in multiple (gang) culvert installations, one culvert shall be installed at an elevation lower than the others;
- v. Turnkey Contractor shall ensure that the natural low flow regime of the watercourse is not altered;
- vi. A culvert shall not be installed before site specific information such as localized stream gradient, fish habitat type and species present have been evaluated;
- vii. Outlets and inlets shall be riprapped to prevent erosion of fill slopes;
- viii. Culverts shall be used of sufficient length to extend a short distance beyond the toe of the fill material;
- ix. Backfilling material shall be used which is of a texture that shall support the culvert and limit seepage and subsequent washing out;
- x. Culverts shall be aligned such that the original direction of stream flow is not significantly altered;
- xi. Fill and construction debris shall be removed from the culvert area to a location above the peak flow level to prevent its entry into the stream;
- xii. Construction activity shall be confined to the immediate area of the culvert;
- xiii. Fill material shall not be removed from streambeds or banks when installing a culvert; except when removal of material is necessary to ensure a flat foundation;
- xiv. The use of heavy equipment in and near watercourses shall be restricted and minimized; where possible, an excavator shall be used from shore rather than a bulldozer in the watercourse. Where it is absolutely necessary to do so, instream work shall be performed by rubber tired vehicles only, and shall only be done in compliance with approvals from NDOEC and DFO, respectively;
- xv. As required, cofferdams of non-erodible material shall be used or the cofferdams should be suitably riprapped to separate work areas from the watercourse when excavating for culverts and footings; and

- d) When fording any watercourse, the Environmental Guidelines for Fording from the Newfoundland and Labrador Department of Environment and Conservation, Water Resources Division 1992 and the guidelines outlined in DFO fact sheet NO. 4 and Gosse et al. (1998) shall be applied in conjunction with the following:
- e) Crossings shall be restricted to a single location and crossings made at right angles to the watercourse;
- f) Equipment activity within the watercourse shall be minimized by limiting the number of crossings;
- g) Turnkey Contractor shall ensure that all equipment is mechanically sound to avoid leaks of oil, gasoline and hydraulic fluids



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- h) Turnkey Contractor shall ensure that no servicing or washing of heavy equipment occurs adjacent to watercourses; temporary fuelling, servicing or washing of equipment in areas other than the main fuel storage site shall not be allowed within 30 m of a watercourse except within a refuelling site approved by the Newfoundland and Labrador Department of Government Services , where conditions allow for containment of accidentally spilled fuels; remove from the work area and properly dispose of all waste oil, filters, containers or other such debris in an approved waste disposal site;
- i) Turnkey Contractor shall stabilize the entire fording area using vegetation mats, corduroy roads or coarse material (125 mm diameter or greater) when such material is available from a reasonably close location within the right-of-way, and the ford area is not natural bedrock, or is easily disturbed by fording; when the substrate of the ford area is not subject to easy disturbance by fording, or coarse material is not easily available within the right-of-way, fording under existing substrate conditions may occur under the direction of the Contractor's On-Site Supervisor;
- j) Turnkey Contractor shall ensure that fording activities shall not decrease the depth of the watercourses to less than 20 cm; where the existing depth is less than 20 cm, that depth shall be maintained;
- k) Turnkey Contractor shall ensure that fording activities are halted during high flow periods;
- l) All bank sections which contain loose or erodible materials shall be stabilized; if banks must be sloped for stabilization, no material shall be deposited within the watercourse; sloping shall be accomplished by back-blading and the material removed shall be deposited above the high water mark of the watercourse;
- m) All fording activities shall comply with the required approvals from the NDOEC and DFO;
- n) The flow of water shall be diverted around the work area during the installation of a culvert to ensure dry conditions are prevalent for construction activities; and
- o) Culverts shall be marked to indicate their position under the snow.



3.6 LINEAR DEVELOPMENTS

Environmental Concerns

The construction of access roads and aerial electric power lines can cause local disturbance of both terrestrial and aquatic habitat as well as causing local soil erosion.

Linear developments encompass a diverse range of construction related activities which are standard operations for most project types such as access road construction, ditching, right-of-way clearing and grubbing, and aerial electric power line construction.

Environmental Protection Procedures

Access Road Construction/Maintenance

- a) Aggregate (fill) materials for road construction shall not be removed from any stream.
- b) Siltation control measures such as sediment traps and check dams shall be installed where required. Solids which accumulate in a settling pond or behind a sediment trap shall be removed on a regular basis to ensure such devices remain effective. The sediments recovered shall be stored in a confined area where it will not be able to erode and enter a water body.
- c) Work shall not be undertaken on easily erodible materials, during or immediately following heavy rainfalls.
- d) The Turnkey Contractor shall obtain Environmental Approval to Alter a Body of Water for site drainage, watercourse crossings, fording as well as any work within 15 metres of the high water mark of any body of water including but not limited to, landscaping, clearing or cutting of vegetation.
- e) The Project Site is located between, but relatively far away from, two public water supply areas. The Turnkey Contractor shall not interfere with or conduct any work within those areas. Should any problem arise in relation to those areas during the construction of the Project, the Water Resources Division must be notified immediately.



Aerial Electric Power Line Development

- f) Where possible, to minimize ground disturbance from vehicular movement, transmission line construction shall take place during the winter months when the ground is frozen.
- g) ATV use will comply with the Motorized Snow Mobile and All-Terrain Vehicle Regulations, 1996 under the *Motorized Snow Mobile and All-Terrain Vehicle Act*.
- h) Vehicles required for construction are not to travel through waterbodies. Vehicles are to travel in a straight line and single file as much as possible and only travel through areas as required. Existing paths are to be used as much as possible.
- i) No transmission line poles shall be placed directly in a waterbody. Wetlands will be avoided when possible.
- j) Transmission line pole support cribs shall be filled with material excavated on site. Such material shall be cleaned of excess soil and debris prior to being placed in the support cribs.
- k) Revegetation of the paths created by vehicles during the construction of the transmission lines shall take place where appropriate following construction.

Drainage

- a) Access roads shall be adequately ditched where necessary to allow good drainage: roadside ditches shall discharge onto vegetated areas, never flow directly into a watercourse.
- b) Wherever possible, ditches shall be kept at the same gradient as the road.
- c) If they are required, the location of all culverts shall be marked with a post so they can be located during snow removal operations or if they fill in from debris accumulation.
- d) Should any development or water related problem arise in relation to the local municipal water supplies during the construction of the Project, the Water Resources Division must be informed immediately (709-729-2535).

3.7 DITCHING

Environmental Concern

These activities increase the potential for erosion due to exposed soils and the associated effects of runoff containing high sediment loads on nearby water quality, aquatic ecosystems and environmentally sensitive areas.

Ditching consists of excavation and grading to construct a new ditch or to re-establish an existing, deteriorated ditch. Ditching is undertaken to affect drainage within the road system and to correct deficiencies such as erosion, non-conformity in grade and restrictive vegetative growth that may impede drainage.

Environmental Protection Measures

The following procedures shall be used to minimize the potential environmental effects associated with ditching:

- a) Ditching shall proceed in the upslope direction and wherever possible, ditches shall be kept at the same gradient as the road.
- b) Trapezoidal ditches result in less erosion of the ditch bottom and should be installed where space requirements allow. Where this is not possible, a V-bottom design may be used.
- c) Natural drainage shall be maintained whenever practical.
- d) Ditches shall not empty into any natural wetland or watercourse.
- e) Rip-rap or an erosion control blanket designed for high flows shall be used to line the bottom of ditches that have steep gradients and/or excessive erosion.
- f) Siltation control measures such as sediment traps shall be installed where appropriate. Solids which accumulate in a settling pond or behind a sediment trap shall be removed on a regular basis to ensure such devices remain effective.
- g) Work shall not be undertaken on easily erodible materials, or during or immediately following heavy rainfalls.
- h) Any petroleum, septic waste or otherwise contaminated material encountered in a ditch shall be immediately reported to the Newfoundland Department of Environment and Conservation and to the Owner.



3.8 INFILLING AND GRADING

Environmental Concerns

These activities increase the potential for soil erosion and the associated effects of runoff containing high sediment loads on nearby water quality, aquatic ecosystems and environmentally sensitive areas.

Infilling consists of placing soil and/or rock for Site development and construction purposes. This includes preparation and construction of access roads, wind turbine foundations, laydown area and Project substation. Placing material in depressions to level them off helps to minimize ponding. Grading consists of shaping the unpaved road or site surface and shall be used to stabilize surface drainage and to provide for runoff in a controlled manner.

Environmental Protection Procedures

The following procedures shall be used to minimize the potential environmental effects associated with the infilling and grading activities:

- a) Grading and infilling shall only be conducted where absolutely necessary.
- b) Areas where little or no vegetation exists may be graded after a light rain when the surface is in an optimum state for compaction, but not after heavy rains which promotes runoff conditions.
- c) The elevation of the infilled or graded area shall be maintained higher than the ditch into which it is draining.



3.9 DEWATERING

Environmental Concerns

The major concern associated with the dewatering of construction sites is siltation and its associated effects on water quality, aquatic ecosystems and environmentally sensitive areas. Some work areas during Site development may require dewatering.

Environmental Protection Procedures

The following procedures shall be used to minimize the potential environmental effects associated with the dewatering activities:

- a) Filtration or other suitable measures, such as settling ponds, silt fences and dykes, shall be provided to remove silt and reduce the turbidity of water pumped from work areas before discharging.
- b) Where possible, clean water shall be discharged to vegetated work areas to further reduce any potential impacts on watercourses.
- c) The area of settling ponds shall be gauged to accommodate the anticipated volume of discharged water.
- d) Discharged water shall be encouraged to follow natural surface drainage patterns, after proper settling in siltation ponds.
- e) Water pumped from excavations or work areas, or any runoff or effluent directed out of the Site shall have silt and turbidity removed by settling ponds, filtration or other suitable treatment before discharging to a body of water. Effluent discharge shall comply with all appropriate federal, provincial and municipal regulations, including Schedule A of the *Environmental Control Water and Sewage Regulations, 2003* under the *Water Resources Act*.



3.10 CONSTRUCTION EQUIPMENT USE AND MAINTENANCE

Environmental Concerns

Environmental concerns associated with the operation and use of construction equipment includes accidental spills and chronic leaks of fuels and lubricating oils which may contaminate local waterbodies and water supplies. A variety of equipment such as bulldozers, shovels, graders, water pumps, hoses and generators are frequently used in construction work as well as in their accompanying support and supply facilities.

Environmental Protection Procedure

The following procedures shall be used to minimize the potential environmental effects associated with the equipment use and maintenance activities:

- a) Fuel shall not be stored near generators or located adjacent to water bodies.
- b) Drip pans shall be placed underneath all pumps and generators located near waterbodies.
- c) Hoses and connections on equipment located near water bodies shall be inspected routinely for leaks and drips.
- d) All leaks shall be repaired and reported immediately to the Turnkey Contractor's On-Site Supervisor and to the Owner.
- e) Equipment maintenance and fuelling activities shall only be performed at a designated site located away from any water body or wetland.
- f) All equipment is to be kept clean and in proper operating condition.
- g) Spill kits will be maintained on site as described in Section 3.14 – Storage, Handling and Transfer of Fuel and Other Hazardous Material.



3.11 HEAVY EQUIPMENT MOVEMENT ON SITE

Environmental Concerns

Heavy equipment movement at the Project Site has the potential to impact aquatic ecosystems and water quality, as well as environmentally sensitive areas. A variety of equipment is required for the various stages of project construction. This equipment includes bulldozers, backhoes, excavators, muskeg, large trucks, flatbed trailers, large cranes, graders and other equipment as required.

Environmental Protection Procedure

The following procedures shall be used to minimize the potential environmental effects associated with heavy equipment movement activities:

- a) ATV use will comply with the Motorized Snow Mobile and All-Terrain Vehicle Regulations, 1996 under the *Motorized Snow Mobile and All-Terrain Vehicle Act*.
- b) Equipment and vehicles shall only operate on the access road, laydown area and cleared areas designated for construction activities except for those used in the clearing and transmission line construction.
- c) Vehicles required for the construction of the transmission lines are not to travel through waterbodies. Vehicles are to travel in a straight line and single file as much as is possible and only travel through areas as required. Existing paths are to be used as much as possible.
- d) Soil erosion control measures shall be monitored during construction activities by the Turnkey Contractor. If erosion occurs, it shall be repaired promptly by the Turnkey Contractor.



3.12 DUST CONTROL

Environmental Concerns

Environmental concerns associated with dust within the Project area include human health effects and potential impacts on aquatic ecosystems and vegetation.

Environmental Protection Procedure

- a) Dust from construction activities will be controlled using water. Waste oil shall not be used for dust control.



3.13 SEWAGE AND SOLID WASTE DISPOSAL

Environmental Concerns

The release of untreated sewage and solid waste is a concern to human health, drinking water quality, and aquatic ecosystems. Solid waste (domestic waste, paper, cardboard, wood), if not properly controlled and disposed of, will be unsightly and may cause human safety and health concerns.

Environmental Protection Procedures

Sewage:

- a) Portable toilets shall be placed temporarily on site during the Project construction. The disposal of sewage shall comply with the Department of Health guidelines and the Environmental Protection Act, and Department of Environment and Conservation Regulations. Sewage will be stored in holding tanks and disposed off site in an approved manner.
- b) Development of sewage facilities shall proceed in consultation with the relevant regulatory agencies for a temporary Sewage Collection System and a certificate of approval shall be obtained from the Government Service Centre of the Department of Municipal and Provincial Affairs and NDOEC. A copy of the certificate of approval shall be provided to Owner
- c) Chlorine shall not be used for sewage waste disinfection.

Solid Waste:

- d) Solid waste produced by site personnel and operations shall be collected and disposed of at an approved landfill site (St. Lawrence) with the permission of the operator of the site.
- e) Waste accumulated on Site prior to disposal shall be confined so that it does not pose an environmental or health hazard.
- f) No waste material shall be deposited in or within 30 m of a watercourse.
- g) All activities associated with the undertaking are subject to the Waste Management Regulations, 2003 under the *Environmental Protection Act*.
- h) Waste receptacles shall be installed at all active landing areas for use by workers. The Turnkey Contractor shall ensure that all lunch waste and empty oil containers are recovered and disposed of appropriately.



3.14 STORAGE, HANDLING AND TRANSFER OF FUELS AND OTHER HAZARDOUS MATERIALS

Environmental Concerns

The major concern regarding the use of fuels and other hazardous materials is their uncontrolled release to the environment through spillage and subsequent adverse effects on terrestrial and aquatic habitat and species, soil, groundwater quality and human health and safety. Hazardous materials include oils, greases, diesel, gasoline, hydraulic and transmission fluid and lubricants.

Environmental Protection Procedures

The following procedures shall apply to the use of fuel and other hazardous materials:

- a) Hazardous materials shall be used only by personnel who are trained and qualified in the handling of these materials and only in accordance with the manufacturer's instruction and government regulation.
- b) The Workplace Hazardous Materials Information System (WHMIS) Regulations, 1996 under the *Occupational Health and Safety Act* will apply to all handling and storage of hazardous materials, and thus all relevant Material Safety Data Sheets (MSDS) will be readily available and maintained current.
- c) A complete inventory of the hazardous materials on the job site shall be maintained according to the WHMIS. This inventory shall be made available to regulator agencies upon request.
- d) The transportation of hazardous materials shall be conducted in compliance with the *Federal Transportation of Dangerous Goods Act*.
- e) All necessary precautions shall be taken to prevent and minimize the spillage, misplacement or loss of fuels and other hazardous materials.
- f) Before installing fuel storage tanks, the necessary approvals in compliance with *The Storage and Handling of Gasoline and Associated Products, 2003* under the *Environmental Protection Act* shall be obtained from Government Service Centre of the Department of Municipal and Provincial Affairs. Copies of the storage tank approval shall be provided to the Owner.
- g) Storage tanks will be equipped with spill kits and additional spill kits will be available at a designated central storage location. All fuel transfer vehicles will be equipped with spill kits. All fuel handling personnel and other designated personnel will be trained in the use of spill kits and all training will be documented.



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h) Inventory of spill kits will be checked and verified to include at the minimum:

2 45 gallon polyethylene drums complete with covers and lever locks, printed
'SPILL KIT'
2 bags 44 litres each – *Oclansorb
100 Hi Point absorbent pads (3/8" x 17" x 19")
2 Spark resistant poly-shovels
10 4-mil yellow heavy duty disposal bags (30"x48")
10 4" x 4" Sorb Sox
10 4" x 8" Sorb Sox
2 Pairs chemical resistant gloves

- i) In the event of any spill on land regardless of size that may enter a waterbody frequented by fish must be reported immediately to the spill line (709) 772-2083 or (800) 563-9089 as required by the *Fisheries Act*. Spills of 70 litres or more are to be reported in accordance with provincial regulation.
- j) Fuels and other hazardous materials shall be handled only by persons who are trained and qualified in handling these materials in accordance with the manufacturer's instructions and government laws and regulations. Operators shall be in attendance for the duration of a refuelling operation. In the event of a fuel spill the Canadian Coast Guard shall be contacted immediately as well as the Newfoundland Department of Environment and Conservation. The Owner shall also be notified immediately.
- k) Oils, grease, gasoline, diesel or other fuels shall be stored at least 100 m from any surface water.
- l) Handling and fuelling procedures shall comply with *The Storage and Handling of Gasoline and Associated Products, 2003* under the *Environmental Protection Act* and any additional requirements put forth by the NDOEC in order to limit potential contamination of soil or water.
- m) Fuel storage areas and non-portable transfer lines shall be clearly marked or barricaded to ensure that they are not damaged by moving vehicles. The markers shall be visible under all weather conditions. Barriers shall be constructed in compliance with the *Storage and Handling of Gasoline and Associated Products, 2003* under the *Environmental Protection Act*. Fuel transfer lines shall be equipped with check valves to prevent spillage in the case of equipment failures.
- n) Waste oils, lubricants, and other used oil will be disposed of under contract with a licensed used oil collector in accordance with the *Used Oil Control Regulation, 2002* under the *Environmental Protection Act*. If required by the Minister, a certificate of approval for the collection, storage and transportation of used oil will be obtained.



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- o) All storage tank systems will be inspected on a regular basis as per *The Storage and Handling of Gasoline and Associated Products, 2003*. This involves, but is not limited to, gauging or dipping and the keeping of reconciliation records for the duration of the program.
- p) Contracted fuel suppliers will, before transporting or positioning fuel at the exploration site, have on file copy of their fuel and hazardous material spills contingency plan which is required under *The Storage and Handling of Gasoline and Associated Products, 2003* and which is acceptable. The fuel and hazardous material spills contingency plan for Anaconda is provided in Section 3.1.
- q) Smoking shall be prohibited within 10 m of a fuel storage area.
- r) Temporary fuelling or servicing of mobile equipment in areas other than the main fuel storage site shall not be allowed within 100 m of a watercourse and shall be carried out on a prepared impermeable surface with a collection system.
- s) The Contractor shall, within thirty (30) days of known decommissioning of a storage tank system, empty the system of all products, remove the tank and associated piping from the ground, remove any contaminated soil, clean the area and restore the site.
- t) Any soil contaminated by small leaks of oil or grease from equipment shall be disposed of in accordance with the *Waste Management Regulations, 2003* under the *Environmental Protection Act* and the Used Control Regulation, 1985.
- u) A copy of the Contingency Plan for Fuel and Hazardous Material Spills (Section 5.1) shall be present at storage facilities and during transfer of fuel. In the event of a spill, the outlined procedures shall be followed.
- v) Bulk fuel storage facilities shall be dipped on a weekly basis in order to accurately gauge fuel consumption. These consumption rates shall allow for visually undetectable sources of contamination to be identified and corrected.
- w) Drums of fuel, oil, hydraulic fluids, and other chemicals shall be tightly sealed against corrosion and rust and stored in a dry, water-tight building or shed having an impermeable floor. Waste oils and lubricants shall be retained in an appropriately labelled tank or closed container.

Refuelling and Maintenance

- a) Refuelling and maintenance activities shall be undertaken on level terrain, at least 100 m from any surface water, on a prepared impermeable surface with a collection system to ensure oil, gasoline and hydraulic fluids do not enter the environment.



3.15 LIGHT AND NOISE LEVELS

During construction and commissioning there will be an increase in noise levels due to increased vehicle traffic. The use of dynamite during the construction phase will also cause instantaneous noise emissions from the Site.

Environmental Concerns

A variety of noises associated with heavy construction activity can cause avoidance by wildlife resources and alter their distribution or movements. Noises associated with blasting and heavy equipment use are temporary in nature.

Cranes and erection equipment will be used at heights where they could pose safety concerns for air navigation.

There is the potential for visual impacts to local residents as well as for migratory avian populations.

Environmental Protection Procedures

Measures shall be implemented wherever possible to minimize potential impacts arising from a variety of noise sources.

- a) Blasting plans shall be developed and wildlife surveillance undertaken prior to blasting, as required.
- b) All vehicles and generators shall have exhaust systems regularly inspected and mufflers shall be operating properly.
- c) Lighting and working hours are to be regulated by conditions of the municipal permit (if applicable) and the consultation with local authorities. Construction activities are anticipated to take place only during daylight hours.
- d) All vehicles shall follow a designated project route and shall be properly maintained to minimize noise.
- e) The Turnkey Contractor shall be responsible for ensuring all erection equipment shall be illuminated as per the requirements of the *Canadian Aviation Regulations 2005-2 Part VI General Operating and Flight Rules Standard 612.19 Standard Obstruction Markings (2005)*.
- f) The Turnkey Contractor shall be responsible for issuing notice to Transport Canada 30 days prior to the construction of the Project.



3.16 VEHICLE TRAFFIC

During any construction related operations, the level of activity involving equipment movement, types of equipment and supply, etc. require various infrastructure such as roads, to conduct the work efficiently and in an environmentally acceptable manner. Typically, resource road construction is supported by vehicles ranging in size from all terrain vehicles (ATVs) to heavy equipment, all of which can result in ground disturbance.

Environmental Concerns

Direct physical disturbances as a result of vehicular movements can adversely affect both terrestrial and aquatic environments.

Environmental Protection Procedures

- a) ATVs shall not be allowed on the Site except as required by Turnkey Contractor in the performance of the Work.
- b) ATV use will comply with the Motorized Snow Mobile and All-Terrain Vehicle Regulations, 1996 under the *Motorized Snow Mobile and All-Terrain Vehicle Act*.
- b) Where possible, the use of ATVs shall be restricted to designated trails and roadways, thus minimizing ground disturbance. ATV use shall comply with the appropriate legislation and the Environmental Guidelines for Stream Crossings by All-Terrain Vehicles.
- c) Vehicle movements shall be restricted to developed areas such as access roads except for the construction of the aerial 25 KV and 66 KV collector power lines.
- d) During winter when the ground is covered with snow, snow machines shall be used for equipment movement and supply. Where possible, snow machines shall use established pathways, minimizing disturbances to vegetation.
- e) The use of heavy equipment in and near watercourses shall be minimized and restricted; where possible an excavator shall be used from shore rather than a bulldozer in the watercourse. Where it is absolutely necessary to do so, instream work shall be performed by rubber tired vehicles only, and shall only be done in compliance with permits and approvals from NDOEC and DFO, respectively, as obtained by the Turnkey contractor. Copies of such permits and approvals shall be provided to Owner.

3.17 BLASTING

Given the nature of the terrain of the Site, blasting will be required for the construction of the wind turbine foundations and the access roads and erection pads. Blasting will be undertaken in association with quarry development, excavation, and foundation preparation.

Blasting near waterbodies will be avoided as much as possible.

Environmental Concerns

The principal environmental concerns include the following:

- a) destruction of vegetation outside Project Site limits;
- b) noise disturbances to wildlife; and
- c) disturbance of archaeological resources.

All blasting shall be done in compliance with the appropriate permits and approvals. All blasters shall have a Blasters Safety Certificate from the Newfoundland Department of Environment and Conservation. All temporary magazines for explosive storage shall have the appropriate approvals. All permits and approvals shall be obtained by the Turnkey Contractor. Copies of all permits and approvals associated with blasting and the storage of explosives shall be provided to Owner by the Turnkey Contractor.

Environmental Protection Procedures

The handling, transportation, storage and use of explosives and all other hazardous materials shall be conducted in compliance with all applicable laws, regulations, orders of the Newfoundland Department of Environment and Conservation, the Department of Mines and Energy, and the *Transportation of Dangerous Goods Act*. The following measures shall be implemented to minimize the impact of the use of explosives and blasting.

- a) Explosives will be used in a manner that will minimize scatter of blasted material beyond the limits of the activity. Damage to the organic mat outside of disturbed areas shall be restored as required and as directed by the Turnkey Contractor's Engineer.
- b) Blasting pattern and procedures shall be used which minimize shock or instantaneous peak noise levels.
- c) Blasting shall not occur in the vicinity of fuel storage facilities.
- d) The Blasters Safety Certificates (from the DOEC) and the Temporary Magazine License (from Energy, Mines and Resources Canada) will be obtained prior to drilling and blasting and copies of same shall be provided to Owner by the Turnkey Contractor.



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- e) Use of explosives shall be restricted to authorized personnel who have been trained in their use.
- f) Turnkey Contractor shall have separate magazines on Site, a magazine for explosives and a smaller cap magazine for dynamite blasting caps.
- g) If sensitive terrestrial species (e.g. moose and caribou) are observed then precautionary measures shall be taken. Any animal sightings shall be reported to the Contractor's On-Site Supervisor and the Owner.
- h) If blasting is necessary within the vicinity of an archaeological site, precautions shall be taken to ensure that blasted material and shock waves do not disturb any part of the site. If necessary, protective covering shall be applied to the site under the supervision of an archaeologist. Blasting shall not be undertaken in these areas without first notifying the Owner.
- i) Blasting shall not occur within a water body. However, if it is deemed absolutely necessary, it shall be undertaken in compliance with the required Water Resources Permits and Approvals for Works or Undertakings Affecting Fish and Fish Habitat by DFO. Ammonium Nitrate based explosives will not be utilized in or near water bodies because of the production of toxic by-products.
- j) Blasting activities shall be done in a manner which ensures that the magnitude of explosions is limited to that which is absolutely necessary. A blasting plan shall be reviewed with the local municipal officer in advance of work. The Contractor's On-Site Supervisor shall monitor the blast.
- k) Prior to any blasting near water bodies, a visual reconnaissance of the area shall be undertaken to ensure that there are no mammals, or concentrations of birds or waterfowl. Blasting shall be delayed in such circumstances until they have been allowed to leave the area of their own accord. Under no circumstances shall noise or other devices be used to harass or otherwise disturb these animals to encourage them to leave the area of the proposed blast.



3.18 QUARRYING AND AGGREGATE REMOVAL

Quarrying may be required to provide source material for the construction of access roads and erection pads.

Environmental Concerns

The principal concerns for quarry development and associated aggregate removal include the potential for sedimentation of freshwater systems and loss of terrestrial habitat and land use.

Environmental Protection Procedures

The following measures shall be implemented to minimize the potential impacts of quarrying activities and subsequent aggregate removal:

- a) Quarry activity shall adhere to all relevant Federal, Provincial and Municipal laws and regulations, and shall be undertaken in strict compliance with quarry requirements from the Department of Mines and Energy *Quarry Materials Act*.
- b) To the extent possible, sources of quarry materials located within the Project area will be allowed.
- c) Quarry permits are required for material taken outside of road right of way for purposes of road construction.
- d) Quarry areas shall be developed in a controlled manner so as to minimize potential environmental effects. The following protection procedures shall be implemented to minimize disturbance and facilitate rehabilitation:
 - i. The development area, stockpile area and limits of clearing shall be staked and/or flagged to prevent over-extension of the development, thereby minimizing the extent of the operation;
 - ii. The area to be excavated shall be cleared of all vegetation prior to any grubbing, excavation or removal of any material.
 - iii. All stumps, organic matter and topsoil shall be stripped from the area to be excavated and stockpiled at least 5 m from uncleared areas; stockpiled stripping shall be kept at least 10 m from the area of excavation; separate overburden piles shall be developed where this material is present; topsoil and the underlying overburden shall not be mixed;



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- iv. Upon completion of excavation of a quarry, no cliff faces or benches shall be left at a height of greater than 5 m. Available material, left over from quarrying and stockpiled overburden shall be used to minimize slopes and face heights; and
- v. Following sloping, the topsoil and any organic materials shall be spread over the disturbed area to promote natural revegetation by adjacent seed sources.
- e) A settling pond shall be established and, if required, cleaned on a regular basis as required to ensure that the retention capacity is maintained at all times.
- f) Dust from aggregate storage and handling shall be controlled with water as required.
- g) Aggregates containing sand sized and smaller fractions shall be stored in such a way as to prevent their erosion.
- h) The Turnkey Contractor shall be responsible for obtaining all permits and approvals required for carrying out any quarry operations. Copies of any such permits or approvals shall be provided to the Owner.



3.19 CONCRETE PRODUCTION/PLACEMENT

Environmental Concerns

Although cured concrete has little effect on water quality, fresh concrete and concrete products may raise the pH in receiving waters to potentially toxic levels (i.e., well above pH 9).

Environmental Protection Procedures

The following measures will be implemented to minimize the potential impacts from concrete production or placement.

- a) Mixing of cement to form concrete will take place at least 100 meters from any watercourse.
- b) Cement or fresh concrete shall not enter any watercourse or water body. Dumping of concrete or washing of tools and equipment in any body of water is prohibited.
- c) If a concrete batch plant is to be used at the site, the measures set forth in the "Environmental Code of Practice for Concrete Batch Plan and Rock Washing Operations" prepared by the Department of Environment and Lands, Industrial Environmental Engineering Division, April 16, 1992 will be followed



3.20 MARSHALLING AND STORAGE AREAS

Environmental Concerns

Areas will be required for storing and maintaining equipment and supplies through the operation phase of the Project. Erosion and run-off of sediment into nearby water bodies will be prevented.

Environmental Protection Procedures

- a) Any new marshalling, maintenance or storage areas required for the Project will be established within the Project property.
- b) Establishing any new marshalling or storage areas will follow the procedures for vegetation clearing (Section 3.2), grubbing and debris disposal (Section 3.3), and infilling and grading (Section 3.9).
- c) External storage areas will be placed on level terrain and kept free of ponding or run-off.
- d) Drainage from areas of exposed fill will be controlled by grade or ditching and directing run-off away from water bodies.



3.21 AVOIDANCE OF MIGRATORY BIRDS AND WILDLIFE

The following outlines the requirements for the avoidance of migratory birds and other wildlife during spring and fall migration and mitigation designed to minimize conflict between wildlife and activities associated with the construction phase of this Project.

Environmental Concerns

Birds may be impacted by sediment plumes, dust, noise and activities that could disturb nesting or feeding migratory birds. Construction activities that involve clearing vegetation and building structures may cause disturbance to migratory birds and their habitat. Wildlife encounters pose a risk for stress or injury of both wildlife and site personnel.

Environmental Protection Procedure

The following procedures are intended to minimize the potential effects of the Project construction on migratory birds and other wildlife:

- a) Under the *Migratory Birds Convention Act* and Regulations, no person shall deposit or permit to be deposited oil, oil wastes or any other substance harmful to migratory birds in any waters or any areas frequented by migratory birds.
- b) The nesting period in the area of the Project is from May to mid-July. The Turnkey Contractor should be aware that migratory birds, their eggs, nests and young are protected under the *Migratory Birds Convention Act*.
- c) If the nest of any migratory bird is encountered during vegetation clearing;
 - i. The nest site and neighbouring vegetation will be left undisturbed until nesting is completed,
 - ii. Construction activities be minimized in the immediate area until nesting is completed,
- d) No person shall disturb destroy or take a nest or egg of a migratory bird.
- e) Avoid disturbances to all birds in and near the project area.
- f) The Turnkey Contractor shall use public roads to access the Project area and to transport waste material to the provincially approved disposal site.
- g) Concentrations of seabirds, waterfowl, or shorebirds shall not be approached.



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- h) The Turnkey Contractor shall be aware of the importance of taking measures to ensure that contaminant spills and littering, regardless of the amount, do not occur at sea or along the shoreline.
- i) Site and working areas shall be kept clean of food scraps and garbage. Waste shall be collected for disposal at an approved landfill site.
- j) No attempts to chase, catch, divert, follow or otherwise harass wildlife by ATV, aircraft, vehicle or on foot shall be made by any person at the Project Site.
- k) Equipment and vehicles shall yield the right-of-way to wildlife.
- l) To avoid increased pressure on wildlife populations through hunting, trapping and angling, these activities shall be banned for the Turnkey Contractor's personnel and that of all of its Subcontractors and vendors. In addition, firearms shall be prohibited on-site with the exception of that authorized for the control of nuisance animals. Such a weapon shall be accompanied by the proper permit, be safely stored and used under the direction of the Turnkey Contractor's On-Site Supervisor, who must be qualified in the use of firearms.



3.22 PUMPS AND GENERATORS

Environmental Concerns

A variety of water pumps, hoses and generators may be in frequent use at the construction site. A back-up generator will be located at the Project substation during operation. Environmental concerns exist with regard to accidental spills or chronic leaks contaminating soil and waterbodies.

Environmental Protection Procedure

- a) Fuel must not be stored near generators or located adjacent to waterbodies.
- b) Drip pans should be placed underneath pumps and generators located near waterbodies.
- c) Hoses and connections on equipment located near waterbodies should be inspected routinely for leaks and drips.
- d) All leaks should be reported immediately to the Project Manager.
- e) In addition to spill kits located at fuel storage tanks additional spill kits will be located at designated central storage location(s). Personnel who deal with fuelling, fuel transfer and pumps and generators will be trained in the use of the kits.



Section 4 Environmental Monitoring

4.1 CONSTRUCTION

Environmental compliance inspections done on-site shall be the responsibility of the Turnkey Contractor. Inspection shall ensure implementation of the general and special environmental protection measures which are specified in this document and the other documents of the Turnkey Contract and this EPP shall be included in all applicable subcontracts and other relevant permits, approvals and authorizations.



4.2 OPERATION

Environmental monitoring programs shall take place during the operations phase of the Project. The inspections to determine the condition and stability of the access roads and other civil works shall be undertaken regularly.

Visual inspection shall be made to determine if any bird or other carcasses are found near or around the base of the wind turbines and associated structures.

Formal bird surveys shall take place for the first three years following the in-service date to determine if there is an impact on the local bird population. Baseline studies were undertaken in the spring and fall of 2002. The results shall be submitted to the CWS and DOEC on an annual basis.

All Project vehicles are to be operated on the Project access roads so as not to cause any soil disturbance. Overhead transmission lines shall be inspected during the winter months by snowmobile so as not to cause ground disturbance.



4.3 CONTINGENCY PLANS

In reaching decisions on containment and clean-up procedures, the objectives of these contingency plans are to minimize the following:

- danger to persons;
- pollution to watercourses;
- area affected by the spill or fire;
- degree of disturbance to the area and watercourses during clean-up; and
- degree of disturbance to wildlife.

Notwithstanding contingency plans, the Turnkey Contractor shall adopt a policy to implement preventative measures as its first line of defence against the possibility of accidents.

Contingency plans to deal with accidents and unplanned situations have been developed as contained herein, and will be modified as required throughout the Project.

5.1 Fuel and Hazardous Material Spills on Land

5.2 Wildlife Encounters

5.3 Discovery of Historic Resources

5.4 Fires



4.4 FUEL AND HAZARDOUS MATERIAL SPILL

Fuel and hazardous materials can be damaging to vegetation, soil, surface water, ground water, wildlife, aquatic organisms, historic resources and human health and safety.

Environmental Protection Procedures

In the event of a fuel or hazardous material spill, the following procedures shall apply.

- a) The WHMIS program shall be implemented throughout the job site in accordance with the *Newfoundland Occupational Health and Safety Act* and regulation governed by the *Workplace Health, Safety and Compensation Commission of Newfoundland*. All employees involved with hazardous materials shall be appropriately trained.
- b) Fuel storage on the work site shall be undertaken in compliance with applicable provincial and federal regulations, codes and guidelines.
- c) The individual who discovers the leak or spill shall make a reasonable attempt to immediately stop the leakage and contain the flow.
- d) Spill location, type of fuel or hazardous material, volume and terrain condition at the spill site shall be determined and reported immediately to the Contractor's On-Site Supervisor, who shall report it immediately to the Coast Guard.
- e) All spills of 70 litres or greater are required to be reported in accordance with provincial regulation. In the event of any spill on land regardless of size that may enter a waterbody frequented by fish must be reported immediately to the spill line (709) 772-2083 or (800) 563-9089 as required by the *Fisheries Act*. Required pertinent information includes:
 - i. name of reporter and phone number;
 - ii. time of spill or leak;
 - iii. time of detection of spill or leak;
 - iv. type of product spilled or leaked;
 - v. amount of product spilled or leaked;
 - vi. location of spill or leak;
 - vii. source of spill or leak;
 - viii. type of accident - collision, rupture, overflow, other;
 - ix. owner of product and phone number;
 - x. if the spill or leak is still occurring;
 - xi. if the spill or leaked product is contained, and if not, where it is flowing;



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- xii. wind velocity and direction;
- xiii. temperature;
- xiv. proximity to water bodies, water intakes, and facilities; and
- xv. snow cover and depth, terrain, and soil conditions.

f) The Turnkey Contractor's On-Site Supervisor shall act as the "On-Scene-Commander" for the purposes of cleaning up a fuel or hazardous materials spill. The Contractor's On-Site Supervisor shall be trained in spill clean-up procedures and how to mobilize the clean-up equipment. The Turnkey Contractor shall have overall responsibility of coordinating a clean-up and maintaining this contingency plan current and up-to-date. The Turnkey Contractor shall have full authority to take necessary and appropriate action without unnecessary delay.

g) The cleanup equipment present at the Site shall include spill kits as described in Section 3.15.

h) In reaching decisions on containment and clean-up procedures, the following criteria shall be applied:

- minimize danger to persons;
- protect water supplies;
- minimize pollution of watercourses;
- minimize area affected by spill; and
- minimize the degree of disturbance to the area and watercourses during clean-up.

i) The On-Scene-Commander shall act in consultation with the regulating authorities to:

j) assess site conditions and environmental impacts of various cleanup procedures;

k) assess potential for fuel recovery versus burning;

l) deploy on-site staff to mobilize pumps and empty 215 L drums or other appropriate storage containers to the spill site;

m) deploy on-site staff to build containment dykes and commence pumping contaminant into drums;

n) apply absorbent as necessary;

o) dispose of all contaminated debris, cleaning materials and absorbent by burning (to which a permit is required), if appropriate, or by placing it in an approved land-fill site with the permission of the Owner; and



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- p) take all necessary precautions to ensure that the incident does not recur.
- q) The Contractor's On-Site Supervisor shall be responsible for the preparation of a written report which shall be sent (as soon as possible and no later than 30 days after the spill) to the Owner ; and, from there to:

Government Service and Lands
Provincial Building
Grand Falls - Windsor
A2A 1W9

and

District Environmental Emergencies Coordinator
Environment Canada
6 Bruce Street
Mount Pearl , NL
A1N 5T3



4.5 WILDLIFE ENCOUNTERS

Environmental Concerns

Wildlife encounters including the attraction to site areas by scavengers pose a risk for stress or injury to both the wildlife and site personnel. Control measures and environmental protection procedures shall be put in place to minimize this risk to wildlife and humans.

Prevention

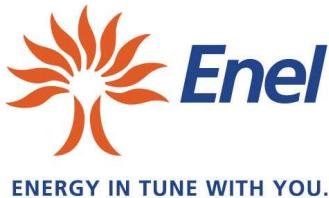
The Turnkey Contractor's On-Site Supervisor shall be responsible to see that the following procedures relating to food preparation, storage and waste disposal are implemented:

- a) Site and working areas shall be kept clean of food scraps and garbage.
- b) Waste shall be collected for disposal at an approved landfill site.

Response Actions

All Turnkey Contractor personnel and those of its Subcontractors, sub-subcontractors, agents and vendors shall abide by the following rules in cases of wildlife encounters:

- c) No attempt to chase, catch, divert, follow or otherwise harass wildlife by ATV, aircraft, vehicle, or on foot shall be made by any person at the project site.
- d) Equipment and vehicles shall yield the right-of-way to wildlife.
- e) No personal pets, domestic or wild, shall be allowed on the Site.
- f) All personnel shall be aware of the potential for encounters with black bears although rare and shall be instructed to immediately report all sightings to the On-Site Supervisor. At his discretion, the Contractor's On-Site Supervisor may notify a representative of the Wildlife Division.
- g) When animals (e.g. moose, caribou) are identified in the area, the Contractor's On-Site Supervisor shall be responsible for all subsequent actions.
- h) To avoid increased pressure on fish and wildlife populations through hunting, trapping and angling, these activities shall be banned for site personnel. In addition, firearms shall be prohibited on-site with the exception of that authorized for the control of nuisance animals. Such a weapon shall be accompanied by the proper permit, be safely stored and used under the direction of the Turnkey Contractor's On-Site Supervisor, who must be qualified in the use of firearms.



4.6 DISCOVERY OF HISTORIC RESOURCES

Environmental Concerns

As appropriate, sites shall be examined prior to the commencement of activities to determine whether the location of such activities is in an area of high archaeological potential, and to identify any site-specific precautions which should be taken. Should any archeologically significant artefacts be found, notice shall be given to the Historic Resources Division by the Turnkey Contractor, including the following details on procedures to conduct a field survey:

- area defined;
- nature of survey, documentation;
- report to be produced; and
- people/agencies to be advised.

Environmental Protection Procedures

All personnel shall be informed by the Turnkey Contractor of their responsibility to report any unusual findings, and to leave such findings undisturbed. In the event of the discovery of a historic or prehistoric artefact or archaeological site the following procedures shall apply:

- a) Under the *Historic Resources Act*, all archaeological sites and artefacts are considered to be the property of the Crown, and shall not be disturbed. The Turnkey Contractor shall take all reasonable precautions to prevent employees or other persons from removing or damaging any such articles or sites and may be held liable for prosecution under Section 35.1 and 35.2 of the *Historic Resources Act* (1985) for all contraventions. Personnel working in the vicinity shall be advised of the find. The site area shall be flagged for protection and avoidance.
- b) Archaeological materials encountered shall be reported initially to the Contractor's On-Site Supervisor, the Owner and immediately thereafter to Ms. Martha Drake, Resource Archaeologist, Culture and Heritage Division, at (709) 729-2462, fax (709) 729-0870 by the Turnkey Contractor and supplied with the following information:
 - i. nature of activity;
 - ii. nature of the material discovered; and
 - iii. precise location of the find.
- c) All work shall cease in the immediate area of the discovery until the proper authorities are advised of the discovery and, in consultation with the Resource Archaeologist, authorize a resumption of the work. If required, a full assessment shall be conducted of the Site and immediate area prior to resumption of work.



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- d) Following an assessment of the significance and mitigation needs, a report shall be made to the St. Lawrence Wind Project and the Historic Resources Division. Any proposed mitigation shall first be approved by the Historic Resources Division.



4.7 FIRE

Environmental Concerns

Activities related to the construction of the Project could cause a fire which could spread to the surrounding area.

Environmental Protection Procedures

The fire prevention and fire-fighting procedures described below shall be followed.

The Turnkey Contractor shall take all precautions necessary to prevent fire hazards when working at the Site. These include but are not limited to:

- a) Proper disposal of all flammable waste on a regular basis.
- b) The Turnkey Contractor shall make available, in proper operating condition, sufficient fire fighting equipment to suit its labour force and fire hazards. Such equipment shall comply with, and be maintained to the manufacturer's standards.
- c) The Turnkey Contractor shall train its personnel in the use of such equipment.
- d) In the event of a brush fire, the Turnkey Contractor shall take immediate steps to contain or extinguish the fire.
- e) The Turnkey Contractor shall appoint a supervisory staff member as On-Scene-Commander for the purpose of fighting any forest fires. The Turnkey Contractor shall then notify the Owner.
- f) Fires shall be reported immediately to the Turnkey Contractor's On Site Supervisor, the nearest Forest Management Unit office and ultimately to the Forest Management Unit office in Clarenville (709-466-7439). The following information shall be provided:
 - i) name of the reporter and phone number;
 - ii) time of detection of the fire;
 - iii) size of the fire; and
 - iv) location of the fire.
- g) The RCMP and St.Lawrence Fire Department shall also be notified immediately (phone number: 911).



Section 5 Permits, Approvals and Authorization

The table below lists the permits, approvals and authorizations which may be required and will be obtained for the construction and operation of the Project. The Owner will be responsible for the permits in Table 6.1 and the Turnkey Contractor will be responsible for the permits in Table 6.2.

Table 5.1 Permits and Authorizations that may be Required of the Owner

Permit, Approval or Authorization	Issuing Agency
Provincial	
• Approval of the Undertaking (Release from Environmental Assessment)	Minister of DOEC
• Approval of Environmental Protection Plan (EPP)	DOEC – Lands Branch
• Permit to Occupy Crown Land	
Federal	
• Safety Lighting for Wind Turbine Operations	TC-NavCan
Municipal	
• Development Permit	Town of St. Lawrence
• Approval for Waste Disposal	
DOEC – Newfoundland and Labrador Department of Environment and Conservation GSC – Newfoundland and Labrador Department of Government Services – Government Services Centre DNR - Newfoundland and Labrador Department of Natural Resources DFO – Fisheries and Oceans TC – Transport Canada, NavCan	



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Table 5.2 Permits and Authorizations that may be Required of the Turnkey Contractor

Permit, Approval or Authorization	Issuing Agency
Provincial	
<ul style="list-style-type: none"> Environmental Approval to Alter a Body of Water Site Drainage Water Use Licence Environmental Permit for Culvert Installation Permit for all Watercourse Crossings 	NDOEC - Water Resources Management Division
Permit to Control Nuisance Animals	DOEC – Inland Fish and Wildlife Division
<ul style="list-style-type: none"> Operating Permit Permit to Burn 	DNR – Forest Resources
Quarry Permit	DNR – Mineral Development Division
<ul style="list-style-type: none"> Approval for Storing and Handling Gasoline and Associated Products Temporary Fuel Cache Transportation of Dangerous Goods Approval for Collection, Storage, and Transportation of Used Oil 	GSC
<ul style="list-style-type: none"> Blasters Safety Certificate Magazine Licence Fire, Life and Safety: Approval of Plans 	GSC – Occupational Health & Safety Division
Federal	
<ul style="list-style-type: none"> Safety Lighting for Erection Equipment and WTG during Installation and Commissioning 	Transport Canada NavCan
<ul style="list-style-type: none"> Temporary Magazine License Blasting Magazine License 	Energy Mines and Resources Canada, Explosives Division
DOEC – Newfoundland and Labrador Department of Environment and Conservation GSC – Newfoundland and Labrador Department of Government Services – Government Services Centre DNR - Newfoundland and Labrador Department of Natural Resources DFO – Fisheries and Oceans TC – Transport Canada NavCan	



Section 6 Cited References

Gosse, M.M., A.S. Power, D.E. Hyslop, and S.L. Pierce. 1998. Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador. Fisheries and Oceans, St. John's, NF. X + 105 pp., 2 appendices.



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Section 7 Contacts List

Environmental Coordinator, Owner

Michael Kehle
NeWind Group Inc, Enel North America Inc.
1255 University Street, Suite 1204
Montreal, QC.
H3B 3W9
Tel : 514-482-6856 ext.233
Fax : 514-397-0284
Email : michael.kehle@northamerica.enel.it

General Manager, Turnkey Contractor

Mr. Brad Cole
PENNECON LIMITED
1309 Topsail Road
P.O. Box 8274 Stn. A
St. John's, NL
A1B 3N4
Tel : (709) 782-3404
Fax : (709) 782-0129
Email : bcole@penncon.com

FOR FIRE / EMERGENCY:

Duty Officer	St. Lawrence Fire Department	(709) 873-2000
Duty Officer	RCMP Detachment (Clarenville)	(709) 466-3211
Forestry	24-Hour Forest Fire Emergency line	(886) 709-3473
US Memorial Hospital (St. Lawrence)		(709) 873-2220

FOR HAZARDOUS SPILLS:

Duty Officer	Canadian Coast Guard	Phone (800) 563-9089
		Fax (709) 772-5369

Graham Thomas	Environmental Emergencies Coordinator Environment Canada 6 Bruce Street	(709) 772-4285
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Mount Pearl, NL
A1N 5T3

FISH AND FISH HABITAT ISSUES:

John O'Rourke	Area Habitat Biologist (Eastern)	Phone (709) 772-7345
		Fax (709) 772-2659

Newfoundland Department of Tourism, Culture and Recreation – Historic Resources Division

Resource Archaeologist
Tel : (709) 729-2462
Fax : (709) 729-0870

Town of St. Lawrence – Clerk/Manager

Mr. Gregory Quirke
Town of St. Lawrence P.O. Box 128
St. Lawrence, NF.
A0E 2V0
Tel : (709) 873-2222
Fax : (709) 873-3352
Email : townofstlawrence@nf.aibn.com

Town of St. Lawrence Fire Department

Tel : 911

Royal Canadian Mounted Police – Clarenville Detachment

74 Trans Canada Highway,
Clarenville, NL
A5A 1Y3
Tel : (709) 466-3211
Emergency: 911