

GLACE BAY LINGAN WIND POWER LIMITED
10 MW WIND FARM
PROJECT ENVIRONMENTAL PROTECTION PLAN

1.0 Introduction

This Environmental Protection Plan (EPP) is a summary of environmental procedures and controls to be used by the Contractor to ensure that the construction of the wind farm and its associated infrastructure minimizes its potential adverse effects on the environment.

Given the similarity of many of the aspects of the proposed construction to those aspects associated with the construction of highways and structures in the Province of Nova Scotia, this EPP has been adapted from the *Nova Scotia Department of Transportation and Public Works Generic Environmental Protection Plan (EPP) for the Construction of 100 Series Highways (June, 2005)*.

External references to this document include:

- *Erosion and Sediment Control Handbook for Construction Sites* (NSDOE, 1988)
- Environmental Assessment Approval, 4MW Lingan Wind Power Project (NSEL, 2005)

This EPP has been developed to:

- Provide regulatory agencies with a generic description of the procedures and controls that GBLWP and its Contractors will follow during construction to provide environmental protection; and
- Provide GBLWP and its Contractors with concise guidance on the methods to be used to protect the environment during construction.

2.0 Environmental Protection Measures

2.1 Wildlife

In the planning of the project, all sensitive wildlife habitat has been avoided, however, the following general protection measures that apply during construction:

- a) GBLWP employees and Contractor employees and agents shall not interfere with wildlife.
- b) Should important wildlife species be encountered during construction, impacts shall be minimized by avoiding noisy, disruptive activities during sensitive wildlife periods (e.g., March to June for nesting birds).
- c) No one shall disturb, move or destroy migratory bird nests. If a nest or young birds are encountered, the Contractor shall cease work in the immediate area of the nest and contact DNR and the GBLWP.
- d) All refuse shall be disposed of at an approved landfill facility. Refuse stored on site prior to removal shall be stored in closed containers.

e) Report any nuisance wildlife to the GBLWP or directly to the local DNR office.

2.2 Land Use and Access

In order to minimize inconvenience to surrounding landowners and users, the Contractor shall:

- a) Control litter and construction waste on site including off-site office sites and camps. All waste shall be removed from the job site and disposed of in accordance with NSEL and municipal requirements.
- b) Not burn construction waste or refuse.
- c) Make every effort to carry out the work in a manner that causes minimum inconvenience to adjacent landowners.

2.3 Erosion and Sediment Control

The Contractor has the ultimate responsibility to install, maintain, and monitor ESC measures until the completion of the contract. The GBLWP and GBLWP inspectors will conduct daily inspections. The following general requirements shall be adhered to by the Contractor:

- a) Adhere to NSEL *Erosion and Sediment Control Handbook for Construction Sites*, including the on-site availability of all Approvals and Terms and Conditions.
- b) Educate all construction personnel about Project Approvals, Terms and Conditions, and the importance of ESC measures and this EPP.
- c) Travel shall be restricted as much as possible to previously disturbed areas such as existing access trails.
- d) Runoff shall be controlled and sediment will be prevented from leaving the site at all times. In addition, to ensure ESC measures are maintained during construction, the Contractor shall periodically inspect all installed ESC measures (especially before and after storm events) and protect exposed soil with either temporary or permanent covers as soon as areas are completed.
- e) Install drainage and siltation control devices prior to grubbing.
- f) Divert clean water from undisturbed areas around the site using berms or lined channels or carry the water across the site in lined channels or pipes.
- g) Maintain on site sufficient quantities of silt fence barrier, straw/hay mulch, compost, bark, Clear Stone, erosion control blanket and geotextile fabric to address ESC issues as the work progresses.
- h) Maintain sufficient personnel and equipment to manage erosion and sediment control during storm events and other emergency situations.
- i) Should a storm event be predicted, the Contractor shall inspect all installed ESC measures and implement additional controls as necessary to ensure runoff leaving the site meets the <25 mg/L TSS criterion. The Contractor shall also be prepared to implement a Contingency Plan to deal with emergencies.
- j) Excavations are to be dewatered to an appropriately sized settlement pond or adjacent vegetated areas.
- k) The length of time that soil is exposed shall be minimized. This will be achieved by minimizing grubbing to the extent necessary to meet engineering requirements, and avoiding working during wet periods.
- l) Surface runoff will be directed to vegetated areas where possible, or via stabilized ditch systems which follow similar routing to natural existing drainage patterns.

2.4 Grubbing

Grubbing is the removal of all organic material and unsuitable soil above the underlying subsoil. It also consists of the removal and disposal of all stumps, roots, downed timber, embedded logs, humus, root mat and topsoil from areas of excavations and embankments or other areas as directed by GBLWP.

The follow protection measures shall be implemented during construction:

- a) The area to be grubbed shall not extend beyond the areas necessary for the construction of the project.
- b) The areas where debris from the grubbing operation will be stored shall be selected to minimize any potential impact on watercourses and waterbodies (minimum distance of 100 m).
- c) Grubbing debris shall have appropriate ESC measures applied.
- d) Areas used for the disposal of material removed in the grubbing operation shall not obstruct drainage patterns nor shall runoff from the disposal areas contaminate or cause siltation of waterbodies.
- e) The grubbing debris areas shall be seeded and dressed to establish vegetation as soon as possible.

2.5 Sediment Barriers

Sediment barriers are used as a temporary perimeter control to intercept sediment-laden runoff as it leaves the construction area. The barrier will slow flow and allow sediment to settle out. Sediment barriers are to be used to intercept sheet runoff only. Sediment Barriers can come in several forms:

- Straw/hay bale barriers;
- Silt fence barrier;
- Berm barriers; and
- Sandbag barriers.

2.5.1 Locations

Sediment barriers are to be located in a continuous fashion, perpendicular to the flow. They shall be installed in the following areas:

- to delineate the construction site;
- toe of fill slopes;
- the downhill side of large cut slopes; and
- along watercourses and drainage swales.

During the course of construction, it may be necessary to install sediment barriers at other locations to contain sediment from excavations, embankments or temporary stockpiles of grubbings, topsoil, and root mat.

2.5.2 Construction

- a) Sediment barriers are to be installed (see NSEL's Erosion and Sediment Control Handbook for typical details) prior to any grubbing work commencing on the construction site.

- b) As construction proceeds, the site contours may change, and the barrier location and extent shall be re-evaluated by the Contractor to ensure its effectiveness; and

2.5.3 Maintenance

- a) The barrier shall be inspected after each rainfall and at least daily during prolonged rainfall.
- b) Silt fences installed near watercourses must be inspected daily. Any deterioration or damage is to be repaired immediately, or operations ceased until repairs are complete.
- c) All barriers or parts of barriers that have been damaged shall be repaired immediately.
- d) If barriers are removed or opened to allow equipment to pass, the barrier must be replaced immediately.
- e) If significant volumes of silt (one half the height of the barrier or a depth of 300 mm immediately upstream of the control device) have accumulated against the barrier fence at any location, the silt shall be removed from the barrier or a second line of barrier installed.
- f) Fine colloidal clays may pass through sediment barriers. If this condition is encountered, special ESC techniques may be necessary, *e.g.* settlement ponds treated with flocculants to promote settling.
- g) The barriers shall be removed to the satisfaction of GBLWP when areas upstream of the measure have been stabilized or, in the GBLWP's opinion, they are no longer required.
- h) The area of the removed fence and any exposed sediment removed from the fence shall be dressed, seeded and mulched in accordance with this EPP.

2.6 Straw/Hay Bales

2.6.1 Location

Straw/hay bales are temporary measures used to filter sheet flow and low-flow rill runoff. They may be used on an as-required basis along the toe of fill slopes and as surface protection (*i.e.*, when dispersed on the ground surface).

2.6.2 Construction

- a) Bales for sediment barriers shall be installed in accordance with the NSEL's Erosion and Sediment Control Handbook.
- b) Straw bales shall be installed perpendicular to the flow and keyed in (*i.e.*, placed in a trench measuring 750 mm wide by 150 mm deep).
- c) Bales shall be securely bound and anchored with steel pins or wooden stakes.
- d) The remaining trench space shall then be backfilled and compacted to existing grade.

2.6.3 Maintenance

- a) Sediment behind the bales shall be removed when sediment has accumulated up to one half of the height of the bale.

- b) Bales shall be removed and replaced if they have deteriorated to the point where they are no longer effectively filtering runoff; and
- c) Bales shall be maintained until the area upstream of the bales has been vegetated. On removal, bale strings shall be cut and disposed of, and the straw distributed on the ground.

2.7 Turbine Base Construction

Construction of the turbine bases, in particular, excavation of foundations for the bases may present environmental issues related to water control and erosion and sediment control.

General measures for turbine base construction include:

- a) Water pumped from an excavation shall not be discharged directly to the watercourse or wetland and must be filtered through vegetation or by the use of a filter bag on the end of the discharge hose (or temporarily stored in appropriate-sized settlement ponds). Water entering watercourses shall not have a TSS concentration exceeding 25 mg/L.
- b) Storage and handling of chemicals used in structure construction shall follow the procedures detailed in Section 2.10.

2.8 Stabilization

Stabilization includes those measures applied to areas as part of permanent erosion protection. These measures include: surface roughening; straw/hay, compost, bark mulch, and seeding. Stabilization shall be undertaken within 30 days of an area being completed.

2.8.1 Surface Preparation

Surface preparation shall include:

- a) Removal of all deleterious materials such as sticks, roots or large rocks.
- b) Loosening of the top 50 mm of soil.
- c) Scarification to minimize runoff velocities and to hold seed. Scarification shall be parallel to the contours of the slope.

2.8.2 Straw/Hay, Compost or Bark Mulch

Mulch shall be applied as surface protection on slopes and other exposed ground as directed by GBLWP to prevent erosion. It shall be used as a temporary protection measure for any area that is complete but a delay in seeding is anticipated.

- a) Mulch shall be compost, bark, hay or straw, free of noxious weeds and other undesirable material, and not so wet, decayed or compacted so as to inhibit even and uniform spreading.
- b) The Contractor shall be responsible for confirming that the straw is free of noxious or invasive weeds.
- c) Mulch applied between May 1st and September 1st may or may not require binder. It is recommended that all mulching after September 1st and before May

- 1st shall require binder. Binder (tackifier) shall be applied at the manufacturer's recommended application rate.
- d) All exposed areas prone to erosion and to be stabilized after September 1st shall utilize mulch and binder within 48 hours following the application of the seed mix.
 - e) Mulched areas shall be monitored frequently and additional mulch shall be applied to any bare areas observed.

2.8.3 Seeding

- a) The seed mix (percentage by mass) shall consist of:
 - 40% Creeping Red Fescue
 - 15% Timothy
 - 15% Tall Fescue
 - 10% Kentucky Blue Grass
 - 10% Alsike Clover
 - 5% Red Top
 - 5% Perennial Rye
- b) Seeding shall not be permitted on hardened or crusted soil. Seeding shall be carried out as soon as possible after the completion of the surface preparation.
- c) If seeding is to take place after October 1, 10% oats shall be added to the mix to provide a quick growing, stable root mass.
- d) Each species shall meet or exceed the Canadian Grade Standards for Common No. 1 Seed. The Contractor shall provide the GBLWP with seed certificates to confirm this requirement has been met.
- e) Fertilizer shall be 15-25-15 for seeding done May 1st to Sept. 1st, and 10-20-20 thereafter.
- f) Seeding shall be carried out as soon as possible after completion of the surface preparation.
- g) Application rates shall be as follows:
 - May 1 to September 1 -*
 - Seed 100 kg/ha
 - Fertilizer 625 kg/ha

 - After September 1 -*
 - Seed 100 kg/ha
 - Fertilizer 625 kg/ha
 - Mulch (paper) 350 kg/ha

2.9 Dust Control

The Contractor shall implement dust control measures as required by the GBLWP. Only water shall be used for dust control. The use of chemicals for dust control is prohibited unless approved by the GBLWP.

Additional dust control measures will include:

- a) Clean-up of mud and dust from paved roads and access points;

- b) Cessation of dust generating construction activities during periods of excessive winds.
- c) Timely stabilization of exposed areas prone to wind erosion.

2.10 Petroleum, Oil, Lubricant (POL) and Chemical Handling and Storage

All necessary precautions to prevent and minimize the spillage, misplacement or loss of fuels and other hazardous materials shall be taken. All Acts and Regulations pertaining to special substances shall be followed.

The delivery, storage, use and disposal of these hazardous materials will be handled only by trained personnel in accordance with government laws and regulations. In the event of a spill, follow the procedures detailed in the Spill Contingency Plan.

In addition, the following precautions will be taken:

- a) Equipment used will be mechanically sound with no oil or gas leaks. The Contractor shall undertake frequent inspection of equipment and repair leaks immediately
- b) Fuelling, storage and servicing of vehicles and construction equipment is not allowed within 30 m of a watercourse, drainage ditch, areas with a high water table, or exposed and shallow bedrock.
- c) Spill clean-up materials shall be accessible and maintained in the areas of fuel and chemical storage. Any spilled fuel or lubricants shall be promptly cleaned up and disposed of in accordance with NSEL instructions.
- d) No equipment shall be washed within 30 m of a watercourse, waterbody or wetland.
- e) All tanks shall be protected from collision damage by the use of snow fencing to alert operators, or by the placement of barriers to impede equipment movement near the tank.
- f) Handling and fuelling practices shall ensure that contamination of groundwater will not occur.
- g) Fuel storage areas and transfer lines shall be clearly marked or barricaded to prevent damage from vehicles.
- h) If drums are stored on their sides, the drums shall be stored so that the bungs are in the "9 and 3" position, on level ground and prevented from rolling.
- i) Drum storage areas shall be marked or fenced with temporary fence to avoid impacts.
- j) Day-use quantities can be stored upright or on the side as required. Drip pans lined with absorbent pads shall be used beneath taps.
- k) All stained soil resulting from the use of chemicals or fuels shall be cleaned-up and disposed of prior to leaving the work area.
- l) Waste oils and lubricants will be retained in a closed container, and disposed of in an environmentally acceptable manner.

2.11 Waste Management

- a) Recyclable materials and materials banned from landfills (paper, cardboard, drink containers, wood, scrap steel, paint, metal and tires) will be collected separately for recycling.
- b) There shall be no burning of wastes generated on the site.
- c) Domestic waste from site offices including food waste shall be gathered daily and stored in closed steel containers for removal and disposal at an approved waste disposal site.
- d) Non-recyclable non-hazardous construction wastes shall be removed from site on an as required basis for disposal at an approved waste disposal site.
- e) Rags used in equipment maintenance and other potentially combustible materials will be kept in a container separate from the above materials until the combustible material can be removed from site for disposal.
- f) Waste oils and lubricants will be stored in a labeled tank or drum and disposed of a disposal facility approved for receiving liquid industrial wastes.
- g) Solvents, acids and caustic liquid waste will be collected separately and stored for removal and disposed by a waste management company specializing in liquid and hazardous wastes.

3.0 Contingency Plans

3.1 Chemical and Fuel Spills

Federal and Provincial acts place the responsibility for spill prevention and mitigation on the owner or controller of products or materials that can be spilled. Spills are defined under these Acts, as, but not limited to:

- Spills from containers including drums and tanks;
- Spills resulting from breaks in hydraulic or transfer hoses or piping; and
- Spills resulting from traffic accidents and fire fighting.

In accordance with these Acts, the Contractor has an obligation to:

- Prevent, eliminate or remediate an adverse affect resulting from a spill.
- Report the spill to the GBLWP and other applicable organizations as requested in
- NSEL Approvals and Terms and Conditions.

The Contractor shall reduce the likelihood of spills by implementing effective spill prevention measures such as the careful handling and proper storage of the products in use.

In the event of a spill, the procedures detailed below shall be followed to facilitate a quick response.

- The individual who discovers a leak or spill shall immediately attempt to stop and contain the release;
- Any spill or leak shall be reported immediately to GBLWP;
- GBLWP shall immediately report the release to NSEL (24 hours) at 1-800-565-1633;

- GBLWP will have the authority to take appropriate action without unnecessary delay;
- The Spill Report Form shall be completed immediately by GBLWP, following discovery of a spill or leak and be forwarded to the NSEL Inspector
- GBLWP shall assume the overall responsibility of coordinating a clean up and maintaining this contingency plan current and up-to-date. GBLWP shall, in consultation with regulatory authorities:
 - Deploy on-site personnel to contain the spilled material using a dyke, pit, absorbent material or booms, as appropriate;
 - Assess site conditions and environmental impact of various clean up procedures;
 - Choose and implement appropriate clean up procedure;
 - Deploy on-site personnel to mobilize pumps and empty drums (or other appropriate storage) to the spill site;
 - Apply absorbents as necessary;
 - Dispose of contaminate debris, cleaning materials, and absorbents by placing in an approved disposal site;
 - Take all necessary precautions to ensure that the incident does not reoccur, and
 - GBLWP shall submit a written report to appropriate regulatory authorities as required by applicable legislation.

Clean Up Resources List

In order to respond to accidental releases, the following resources shall be made available on-site in an appropriate location to allow for immediate use:

- Absorbent material (i.e. sorbent pads, Sorb-All, vermiculite); and
- Protective equipment, shovels, rakes, al tool kit, buckets and drums, stakes and tarpaulins.

3.2 Heritage Resources

In the event that a heritage or archaeological feature is encountered during construction, the following measures will be taken to protect the feature(s) from further damage:

- a) All work in the area of the encounter shall cease.
- b) The potential find shall be protected by erection of a snow fence and signed as off limits to construction personnel.
- c) The Contractor shall contact GBLWP and the Provincial Archaeologist or Curator of Special Places (Nova Scotia Museum -Tel: 424-6475, Fax: 424-0560). GBLWP will subsequently inform the Union of Nova Scotia Indians (Kim Paul, Environmental Technical Services at 539-4107).
- d) Work at the site will not be recommence until permission to proceed has been granted by the Nova Scotia Museum.
- e) In the event that human remains are encountered, work shall immediately stop, and the Police and Nova Scotia Museum shall be notified.

- f) No employee or contractor of GBLWP shall enter or climb upon the forward observation post located at North Head.

3.3 Contaminated Sites

In the event that buried debris or contaminated soil is encountered during construction, the following procedure shall be followed:

- a) On detection, cease excavation activity in the area of the discovery and contact GBLWP. Under no circumstances shall the material be excavated without authorization of the GBLWP.
- b) GBLWP or a representative of GBLWP will visually inspect the material to assess potential for hazardous materials.
- c) If hazardous materials are suspected, the GBLWP shall obtain samples following safe sampling practices.
- d) Contaminated soil or debris containing regulated material, suspected asbestos containing material, or other hazardous materials, shall be covered until a management plan is developed and a contractor appropriately trained in the handling of hazardous materials is retained.
- e) GBLWP shall consult with NSEL on the appropriate clean-up program.

4.0 Contact List

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24 Hour Spill Line: 1-800-565-1633