

APPENDIX T
WILDLIFE MANAGEMENT PLAN



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Clydesdale Ridge Wind Project

Draft

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Introduction

The Clydesdale Ridge Wind Project (the Project) is being developed by Clydesdale Holdings Ltd. (the Proponent). The Proponent represents a partnership between Natural Forces Developments Limited Partnership (Natural Forces) and Dalhousie Mountain Wind Energy Inc. The Proponent is further partnering with Mi'kmaq bands in Nova Scotia to ultimately develop, construct, own, and operate the Project.

The Project consists of up to 18 wind turbine generators (WTGs) and is situated adjacent to the operational Dalhousie Mountain Wind Farm, which is owned and operated by an affiliate of Dalhousie Mountain Wind Energy Inc. The Project is located near Mount Thom, Earltown, Loganville, and Berichan in both Colchester County and Pictou County. The proposed WTG locations and associated infrastructure are predominantly on privately-owned lands owned by multiple landowners, with a portion of the access road and collector lines traversing provincial Crown land. The private lands are secured under Lease, Option to Lease, and Easement. The Proponent has an active application for an Easement over the provincial Crown land.

This document outlines the Wildlife Management Plan (WMP) that will be implemented during the construction, operation and decommissioning of the Project. This program has been developed in consultation with Nova Scotia Environment and Climate Change (NSECC) and Nova Scotia Department of Natural Resources (NSNRR). It serves to fulfill the terms and conditions of approval determined by the Minister, and all measures have been integrated into the Environmental Management and Protection Plan (EMPP). This WMP should be read in conjunction with the Project's Adaptive Management Plan (AMP), which details the post-construction monitoring plan to address impacts to migrant avian species. The AMP will be developed and implemented by a third-party consultant in consultation with the NSECC, NSNRR, Canadian Wildlife Services (CWS), and the Mi'kmaq in Nova Scotia. It will follow the most current and relevant Post-Construction Bat and Bird Mortality Survey Guidelines available at the time of the studies. At present, the post construction monitoring studies will be conducted according to the protocols set out by New Brunswick Post Construction Bat and Bird Mortality Survey Guidelines for Wind Farm Development (2011).

For more details of the Project, complete survey methodology and results, and assessment of potential interactions, refer to the Environmental Assessment and the associated addendum.

Objectives

The objective of the wildlife management plan is to reduce unanticipated hazards to avian and bat species as well as terrestrial and aquatic wildlife on site. This document also provides NSECC and NSNRR with the Proponent's measures to protect and mitigate against adverse effects to species at risk (SAR)/species of conservation concern (SoCC) and associated habitats discovered through survey work or that have the potential to be found on site.

Mitigation measures

Terrestrial Wildlife and Habitat

There is potential for the Project to interact with terrestrial flora and fauna including but not limited to reptiles, amphibians, and large mammals. Mitigation measures have been designed to avoid and protect all local wildlife, including SAR. The mitigation measure that will be implemented include the following:

- The spread of invasive species will be mitigated by ensuring that vehicles and construction equipment are cleaned prior to transportation and use. Vehicle cleaning will occur prior to arriving or leaving the site to ensure invasive species are not potentially spread to other areas. All cleaning activities will occur away from any watercourse or wetland;
- To maintain wildlife habitat, vegetation will be retained in areas where clearing is not essential for the construction or operation of the Project;
- The Project footprint will be limited to that which is necessary to enable the Project to be carried out;
- Existing roads and trails will be utilized to limit disturbance outside the Project footprint and minimize the interactions with wildlife and wildlife habitat;
- To minimize disturbance to wildlife by vehicles, a speed limit of 40 km/h will be enforced throughout the site and a speed limit of 15 km/h will be enforced in high-traffic areas (e.g., at and near turbine locations);
- During construction, water or another environmentally benign dust suppressant will be used to prevent fugitive dust;
- No fences that would impede movement of large terrestrial wildlife will be built, and any built fences will not cut off viable habitat for wildlife;
- Glyphosate will not be used in vegetation management for the construction or operation of the Project;
- Vegetation management will be planned outside of breeding bird season (April 5 - August 28), however, in the event that clearing is required during breeding season, nesting sweeps will be conducted at intervals deemed appropriate by registered professional biologists, and best practices will be employed. Should a nest be discovered, the biologist and the Proponent will work with NRR to determine appropriate setbacks from the nest;

- Lighting restrictions (further described in specific measures for birds and bird habitat) will be implemented to reduce effects on wildlife at the Project site;
- During the construction phase, wildlife interactions will be mitigated by ensuring that food waste and other garbage is stored so that it is not accessible by wildlife and disposed properly to avoid attracting wildlife to the site. The site and working areas will also be kept clean of food scraps;
- In the case of wildlife encounters, the following will be implemented: (1) no attempt will be made by any worker at the Project site to chase, catch, divert, follow or otherwise harass wildlife by vehicle or on foot; (2) equipment and vehicles will yield the right-of-way to wildlife; and (3) if a species at risk (SAR) or a nest of any bird is encountered during activities, work around the SAR or nest (and structure housing the nest) will cease until a biologist is dispatched to assess the situation and appropriate mitigation is applied. The Wildlife Communication Plan (Appendix B) will be followed in the event of a wildlife encounter;
- To minimize disruptions to wildlife activity at night, the Project construction activities will be limited to daylight hours. Some construction activities (e.g., critical lifts, concrete pours, and other long duration activities) can only be done safely during the calm weather conditions that may only occur at night. Only in these cases will construction activities be conducted at night. During work at night, all mitigation measures will be applied and staff will be trained on the elevated potential for wildlife interactions at night;
- Instruction will be given to maintenance staff to ensure all work lights are turned off upon leaving the site, particularly during foul weather events;
- Any possible or confirmed nesting of turtles in the Project footprint will be immediately reported to NSNRR;
- Workers will be familiarized with the species at risk (SAR) that were identified as having the potential to occur on site through both field and desktop analysis prior to work commencing. A guide to protected wildlife that have been observed at the site is available as **Appendix A**. Observed SAR will be reported to NSNRR; and
- All workers will be familiarized and will adhere to the provincial Nova Scotia *Endangered Species Act* and *Wildlife Act*, and the federal *SAR Act* and *Migratory Bird Convention Act*.

Birds and Bird Habitat/Bats and Bat Habitat

There is potential for the Project to interact with birds and bats and their habitat. Mitigation measures have been designed to avoid and protect these valued components and have considered the behavior and habitat of all SAR birds and bats observed during the Environmental Assessment studies. The following mitigations will be employed focused on birds and bird habitat, and bats and bat habitat:

- The Proponent will endeavor to conduct construction activities such as clearing and grubbing outside of the time periods in which breeding birds would be in the area;
- Vegetation management will be planned outside of breeding bird season (April 5 – August 28), however, in the event that clearing is required during breeding season, nesting sweeps will be conducted at intervals deemed appropriate by registered professional biologists, and best practices will be employed. Should a nest be discovered, the biologist and the Proponent will work with NRR to determine appropriate setbacks from the nest;
- Should a nesting migratory bird be identified within the work area, CWS and NSNRR will be notified and an appropriate no-work buffer zone (in consultation with CWS and NSNRR) will be applied around the nest until the nest has been fledged. No flagging of the nest will occur to minimize chances of predation;
- Stockpiling of fill and excavated materials will be minimized to deter the potential for nesting by bank swallows or other ground nesting species (e.g., common nighthawk). To lessen the likelihood of bank swallow nesting, stockpiles will be kept at or below a 70 degree slope and will be covered by a tarp if left for an extended period of time (1 month);
- All workers will adhere to the provincial Wildlife Act, the Migratory Birds Convention Act, 2022 and the Migratory Birds Regulations;
- The Proponent will develop an Adaptive Management Plan in consultation with NSNRR and CWS for bird and bat mortality, including a follow up avian mortality survey to be conducted after the Project commissioning, and appropriate actions to be taken should there be a significant negative impact to avian species and migration flyways;
- Annual reports to regulators will be submitted and, if required, any necessary mitigation action (e.g., increasing cut-in speed, and other operational adjustments) will be determined through consultation;
- In addition to these mitigation measures, the Proponent will also submit post-construction data to the Wind Energy Bird and Bat Monitoring Database to support national efforts to better understand wind turbine effects on birds and bats;
- Lighting requirements will meet, but not exceed, Transport Canada standards to minimize the potential impacts to migratory birds;
- Only the minimum amount of pilot warning and obstruction avoidance lighting will be used;
- Only lights with short flash durations and the ability to emit no light during the ‘off phase’ of the flash (i.e., as allowed by strobes and modern LED lights) will be installed on tall structures;

- Lights will operate at the minimum intensity and minimum number of flashes per minute (longest duration between flashes) allowable by Transport Canada;
- Should a bird mortality event occur (an individual migratory bird SAR, or 10 or more migratory birds in one night), CWS and NRR will be contacted within 24 hours (Environmental Emergencies 1-800-565-1633 and CWS main office 506-364-5044 or SCFATLEvaluationImpact-CWSATLImpactAssessment@ec.gc.ca). Reports will include specific details about the event (e.g., location, number of bird and bat mortalities, species, photos, conditions during the previous night, etc.) and the area around each turbine will be further investigated to assess the extent of the event.

Watercourses and Fish Habitat

There is potential for the Project to interact with the aquatic environment, including aquatic SAR and their habitat. Mitigations designed specifically to avoid and protect watercourses and fish habitat are detailed below:

- During the civil design phase, watercourse crossings that require upgrading or construction will be identified. Staff will verify there are no bats using culverts as habitat prior to any work on or around watercourse crossings. In the case of a bat encounter, the following will be implemented: (1) no attempt will be made by any worker at the Project site to chase, catch, divert, follow or otherwise harass wildlife by vehicle or on foot; (2) equipment and vehicles will yield the right-of-way to wildlife; and (3) if a species at risk is encountered during activities, work around the SAR will cease until appropriate mitigation is determined in consultation with NSECC and NRR. The Wildlife Communication Plan (Appendix B) will be followed in the event of a wildlife encounter;
- Construction activities near watercourses will comply with the applicable regulations and guidelines such as the Fisheries Act and will be carried out strictly in accordance with NSECC and DFO Approvals, Terms and Conditions, and Letters of Advice;
- Efforts will be made to build watercourse crossings in areas that exhibit a stable soil type and where grades approaching the crossings will not be too steep. Crossings will span the watercourse;
- Proper erosion and sediment control measures (detailed in the EMPP) will be installed and checked regularly during construction and prior to, and after, storm events to ensure they are continuing to operate properly to minimize potential effects to adjacent habitat;
- In-stream work will be timed to occur in the dry season and not during significant rainfall. Culverts will be designed and installed to prevent the creation of barriers to fish movement and maintain bankfull channel functions and habitat functions to the maximum extent that can be achieved based on resources and ability;

- Prior to in-stream work, fish-outs will be completed to ensure no harm to resident fish species. Captured fish will be released outside of the work area; and,
- Any fish isolated in the work area will be transferred (using appropriate capture, handling and release techniques to prevent harm and minimize stress) downstream or away from the construction area prior to the commencement of work. Intakes of pumps and hoses for de-watering of in-water work areas (if required) will be screened to avoid impingement and/or entrainment of fish.

Emergency Contact List

The following provides contact numbers in the cases involving worker safety, public safety and environmental emergencies.

	Contact Number	Email
Natural Forces		
Construction Manager	902.422.9663 x 222	abradshaw@naturalforces.ca
Senior Wind Technician	902.925.9463	jim@rmsenergy.ca
Environmental Inquiries	902.422.9663	environment@naturalforces.ca
Local Emergency		
Fire Department	911	
Ambulance	911	
RCMP Police	911	
Colchester RCMP	902.893.6824	
Pictou RCMP	902.485.5441	
Colchester East Hants Health Centre	902.893.4321	
Aberdeen Hospital	902.752.7600	
Nova Scotia Environment-Truro Office	902.893-5880	
Nova Scotia Environment-Ganton Office	902.396.4194	
24-hrs Environmental Emergencies	1.800.565.1633	
Canadian Wildlife Services	1.800.668.6767	
Special Places Program (Archaeology, Heritage)	902.424.6475	john.cormier@novascotia.ca
Bird mortality event (one migratory SAR or 10 or more migratory birds in one event)		
Canadian Wildlife Service	506.364.5044	SCFATLEvaluationImpact-CWSATLImpactAssessment@ec.gc.ca

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Appendix A: Species at Risk Wildlife



The purpose of Appendix A is to provide educational information on Species at Risk and protected wildlife with the potential to be present at the Clydesdale Ridge Wind Project. This is intended for any staff who will be on site. The Environmental Monitor will be trained to identify SAR.




Species at Risk with the Potential to be Present at the Project Site




Common Name (Scientific Name)	Legal Protection Status and S- Rank	Photo	Habitat	Identifying Features
INVERTEBRATES				
Monarch (<i>Danaus plexippus</i>)	SARA: SC COSEWIC: E NSES: E S2?B, S3M	 <p>(Eyclopaedia Britannica, 2023)</p>	<p>Breeding habitat dependent on milkweed (shown in photos). Typically found in marshes, fens, rocky freshwater shorelines. Present during spring, summer and fall.</p>	<p>Orange wings with two rows of white spots on margins. Yellow, black and white stripes in larval form.</p>
Yellow-banded Bumble Bee (<i>Bombus Terricola</i>)	SARA: SC COSEWIC: SC S3 NSES: V	 <p>(Government of Canada, 2022)</p>	<p>Native foraging Habitat: Flowers with short or open corollas, blooming through active season Nesting Habitat: Underground Burrows Overwintering Habitat: Rotting logs, loose soil, mulch.</p>	<p>Upperside of much of the abdomen is black, there is a distinctive, broad band of golden yellow hair across segments 2 and 3.</p>



Common Name (Scientific Name)	Legal Protection Status and S- Rank	Photo	Habitat	Identifying Features
MAMMALS				
Little Brown Myotis (<i>Myotis lucifugus</i>)	SARA: E COSEWIC: E NSES: E S1	 <p data-bbox="532 678 920 732">(Species At Risk - Recovery Update, n.d.)</p>	Overwintering and late summer/early fall: Hibernacula such as caves, abandoned mines, wells, tunnels, etc. Summer: Roosting sites such as snags or cavity trees ≥ 25cm in diameter.	8 - 9.5 cm in length.
Moose (<i>Alces americanus</i>)	NSES: E S1	 <p data-bbox="532 1102 920 1157">(Wikimedia, 2022)</p>	Forested or partially forested area.	Long legs, broad torso and neck.
Northern/ Long-eared Myotis (<i>Myotis septentrionalis</i>)	SARA: E COSEWIC: E NSES: E S1	 <p data-bbox="532 1543 920 1598">(Species At Risk - Recovery Update, n.d.)</p>	Overwintering and late summer/early fall: Hibernacula such as caves, abandoned mines, wells, tunnels, etc. Summer: Roosting sites such as snags or cavity trees ≥ 25cm in diameter.	About 9 cm in length. Long ears and tail.



Common Name (Scientific Name)	Legal Protection Status and S- Rank	Photo	Habitat	Identifying Features
Tri-colored Bat (<i>Perimyotis subflavus</i>)	SARA: E COSEWIC: E NSES: E S1	 <p>(Species At Risk - Recovery Update, n.d.)</p>	Overwintering and late summer/early fall: Hibernacula such as caves, abandoned mines, wells, tunnels, etc. Summer: Roosting sites such as snags or cavity trees ≥ 25cm in diameter.	Blond fur on its back. 7 – 9.5 cm in length.
REPTILES				
Eastern Painted Turtle (<i>Chrysemys picta picta</i>)	SARA: SC COSEWIC: SC S4	 <p>(Wikipedia, 2023)</p>	Shallow, slow-moving water such as ponds, swamps, lakes and streams. Often found basking on logs and rocks during the day.	Red and yellow markings on neck, head, legs and edges on shell.
BIRDS				
Bank Swallow (<i>Riparia riparia</i>)	SARA: T COSEWIC: T NSES: E S2S3B	 <p>(Species At Risk - Recovery Update, n.d.)</p>	Nesting burrows excavated in vertical banks, primarily along waterways. Nest from mid-May to late August.	12cm long. White chin and body with a large brown band across the chest. Brown head and wings.




Common Name (Scientific Name)	Legal Protection Status and S- Rank	Photo	Habitat	Identifying Features
Barn Swallow (<i>Hirundo rustica</i>)	SARA: T COSEWIC: SC NSES: E S2S3B	 <p>(Species At Risk - Recovery Update, n.d.)</p>	Forages over open and semi-open areas. Nests typically near foraging areas and can often be found in human structures such as wells, culverts and mine shafts.	15-18 cm long. Steely-blue upperparts with light brown throat, chest and forehead.
Bobolink (<i>Dolichonyx oryzivorus</i>)	SARA: T COSEWIC: T NSES: V S3S4B	 <p>(Species At Risk - Recovery Update, n.d.)</p> <p>(allaboutbirds.org)</p>	Agricultural or native grasslands. High proportion of grass cover and less coverage by trees and shrubs.	Mostly black, with white to grey back and shoulders and a yellow nape. Females and juveniles are beige with dark brown streaks.


Common Name (Scientific Name)	Legal Protection Status and S- Rank	Photo	Habitat	Identifying Features
Canada Warbler (<i>Cardellina canadensis</i>)	SARA: T COSEWIC: SC NSES: E S3B	 <p data-bbox="570 753 883 783">(Environment Canada, 2013)</p>	Associated with sphagnum, deciduous trees and uneven ground. Can be found near streams. Nests in areas with high concealment and dense vegetation /debris.	12-14cm long. Grey back with yellow underparts.
Wood Thrush (<i>Hylocichla Mustelina</i>)	SARA: T COSEWIC: T	 <p data-bbox="623 1085 829 1110">(sdakotabirds, 2017)</p>	Nests in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics but may nest in small forest	Generally rusty-brown on the upperparts with white underparts and large blackish spots on the breast and flanks.
Common Nighthawk (<i>Chordeiles minor</i>)	SARA: T COSEWIC: SC NSES: T S3B	 <p data-bbox="630 1440 823 1465">(McClarren, 2014)</p>	Nests on open ground or clearings. Active near dawn or dusk.	Long pointed wings with a white bar on the underside.

Common Name (Scientific Name)	Legal Protection Status and S- Rank	Photo	Habitat	Identifying Features
Eastern Wood- Pewee (<i>Contopus virens</i>)	SARA: SC COSEWIC SC NSES: V S3S4B	 <p>(Species At Risk - Recovery Update, n.d.)</p>	Prefers mixed forests at intermediate to mature ages with an open understory.	Peaked crown on head, “pee-a-wee” song.
Evening Grosbeak (<i>Coccothraustes vespertinus</i>)	SARA: SC COSEWIC SC NSES: V S3S4B,S3N	 <p>(Species At Risk - Recovery Update, n.d.)</p>	Prefer conifer and mixedwoods for nesting.	Adult males are bright yellow with black and white wings, and a bright yellow forehead. Females and juveniles are generally greyish-brown with some yellow on the neck.
Olive-sided Flycatcher (<i>Contopus cooperi</i>)	SARA: T COSEWIC: SC NSES: T S3B	 <p>(Wickliffe, 2020)</p>	Open coniferous or mixed-coniferous forests, often near water or wetlands.	18-20cm in length. Brownish olive-grey plumage with lighter throat and breast.

Common Name (Scientific Name)	Legal Protection Status and S- Rank	Photo	Habitat	Identifying Features
Rusty Blackbird (<i>Euphagus carolinus</i>)	SARA: SC COSEWIC: SC NSES: E S2B	 <p>(Jauvin, 2017)</p>	Breeds in wetlands and nests in small conifers.	Black feet, pale yellow eyes and pointed wings. Males can have rusty plumage on the head and back. During the summer, females are slate gray with bluish-green gloss.
Red Crossbill (<i>Loxia curvirostra percna</i>)	SARA: T COSEWIC: T	 <p>(D.M. Whitaker, 2016)</p> <p>(Observation, 2021)</p>	Closely associated with cone-productive forests. Mature Black Spruce forests, and to a lesser extent Balsam Fir and White Spruce forests.	Male Red Crossbill's are dull red. Female Red Crossbill's are greyish-olive
PLANTS and LICHENS				

Common Name (Scientific Name)	Legal Protection Status and S- Rank	Photo	Habitat	Identifying Features
<p>Frosted glass-whiskers (<i>Sclerophora peronella</i> Atlantic pop.)</p>	<p>SARA: SC COSEWIC: SC S1?</p>	 <p>(<i>Sclerophora peronella</i>, n.d.)</p>  <p>(Pittao, 2008)</p>	<p>Found on bark and lignum of old deciduous trees.</p>	<p>0.5-0.8 mm tall stalks. Requires microscopic examination to fully identify.</p>

Common Name (Scientific Name)	Legal Protection Status and S- Rank	Photo	Habitat	Identifying Features
Black Ash (<i>Fraxinus nigra</i>)	SARA: Not on Schedule 1 COSEWIC: T NSES: T	 <p data-bbox="558 848 893 905">Canada; Environment and Climate Change (2018)</p>  <p data-bbox="558 1339 893 1392">Canada: Environment and Climate Change (2018)</p>	It occurs most frequently in floodplain forests, basin, seepage and lacustrine swamp forests, shoreline forest margins, and fens.	Broadleaved Hardwood tree. Juvenile bark is soft, corky, easily depressed. Adult bark is grey with vertical, narrow, scaly strips. 3-5 pairs of sessile leaflets per leaf.
Eastern Waterfan (<i>peltigera hydrothyria</i>)	SARA: T COSEWIC: T NSES: T	 <p data-bbox="578 1881 873 1898">Government of Canada (2013)</p>	Grows attached to rocks at or below water level in clear, cool, partially shaded streams.	Leafy Lichen having veins on the under surface that are distributed in a fan-shaped manner. Fixed to rocks by spongy tufts of fibres.

Common Name (Scientific Name)	Legal Protection Status and S- Rank	Photo	Habitat	Identifying Features
Blue Felt Lichen (<i>Degelia plumbea</i>)	SARA: SC COSEWIC: SC NSESA: V	 (NS Nature Trust, 2019)	Usually found on the trunks of old Broad-leaved trees growing in moist habitats or close to stream and lake margins.	Large, blue-grey, leafy lichen that has longitudinal ridges and crescent-shaped curves which often give it a scallop-like shape.

Notes: 1. S-rank refers to the Sub-national (Provincial) rank provided by the Atlantic Canada Conservation Data Centre (AC CDC). S-Ranks are as followed: S1: Critically imperiled in province; S2: Imperiled in province; S3: Vulnerable in province; S4: Apparently secure, uncommon but not rare in province; S5: Secure: Common, widespread and abundant in province. S#S# = a numeric range rank used to indicate any range of uncertainty about the status of the species or community. B= Breeding, N = Nonbreeding, M = Migrant, U = Unrankable, ? = Inexact or Unknown (AC CDC 2021). S-Ranks are as of December 2022. 2. Status refers to listings of E: Endangered, T: Threatened, V: Vulnerable or SC: Special Concern on Schedule 1 of the federal Species at Risk Act (SARA), the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or the Nova Scotia Endangered Species Act (NSESA). 3. Species at Risk are those species whose status is E, T or V/SC. 4. The 2021 winter survey occurred outside of the typical window for winter bird surveys (i.e., in April 2021).

Appendix B: Wildlife Communication Plan

The Environmental Permitting Specialist is responsible for all communication relating to wildlife and SAR between the regulatory agencies as identified in Table 1.

Table 2 below outlines the communication pathways and timing. In non-emergency situations, “immediate” is considered to be within 24 hours.

Table 1. Key Contact List

Position	Name	Phone Number
Project Team Contacts		
Environmental Permitting Specialist	Kellan Duke	902-422-9663 ext.132

Environmental Consultant	Strum Consulting	Office: 211 Horseshoe Lake Dr #210, Halifax, NS B3S 0B9	902-835-5560
Regulatory Contacts			
Nova Scotia Environment and Climate Change Inspection, Compliance and Enforcement (NSECC-ICE)	902-424-2547		
Department of Fisheries and Oceans	Environmental Emergency Response: 1-800-565-1633		
Environment and Climate Change Canada (ECCC), including Canadian Wildlife Service (CWS)	1-800-668-6767		
NS Department of Natural Resources and Renewables (NS NRR), Halifax (Main Office)	902-424-5935 For Wildlife Concerns: 1-800-565-2224		
NS NRR, Bible Hill (Local Colchester County Office)	902-893-5620		
NS NRR, McLellans Brook (Local Pictou County Office)	902-922-4020		
NS NRR, Regional Biologist (Truro)	902-893-6353		
ECCC After Hours Emergency	1-800-565-1633		
RCMP Colchester	902-893-6824		
RCMP Pictou	902-485-5441		

Table 2. Communication Protocol

Category	Type of Observation	Regulatory Agencies (Personnel) to be Notified	Communication Type and Timing
SAR	All SAR - Harmed or Injured 10 or more bird mortalities in a single event	NS NRR Regional Biologist - Central Region: Dean Dillman Dillman.dean@novascotia.ca 902-897-7978 NRR 24hr Emergency Desk 1-800-565-2224 Wildlife Division: biodiversity@novascotia.ca 902-679-6091	Immediate phone call to Regional Biologist or NRR Emergency Desk. Follow-up by email to Regional Biologist and Biodiversity section, Wildlife Division
		ECCC-CWS Main office 506-364-5044 SCFATLEvaluationImpact-CWSATLImpactAssessment@ec.gc.ca	Report, including specific details about the event (e.g., location, number of bird and bat mortalities, species, photos, conditions during the previous night, etc.)
SAR	Non-breeding turtle, bat, or SAR bird	ECCC-CWS (Migratory birds)	Report (phone and email) within 24 hours
		NS NRR (Regional Biologist & Biodiversity Section, Wildlife Division) NS NRR Regional Biologist - Central Region: Dean Dillman Dillman.dean@novascotia.ca 902-897-7978 Wildlife Division: biodiversity@novascotia.ca 902-679-6091	Report (phone and email) within 24 hours

Category	Type of Observation	Regulatory Agencies (Personnel) to be Notified	Communication Type and Timing
		ECCC	Email notification of reporting to ECCC-CWS and NS NRR within 48 hours
SAR	Breeding activities - Turtle nests, bat roots/nests, and potential or confirmed SAR bird breeding activities	ECCC-CWS (Migratory birds)	Immediate phone call and email follow up.
		NS NRR (Regional Biologist & Biodiversity Section, Wildlife Division) NS NRR Regional Biologist - Central Region: Dean Dillman Dillman.dean@novascotia.ca 902-897-7978 Wildlife Division: biodiversity@novascotia.ca 902-679-6091	Immediate phone call and email follow up.
		ECCC	Email notification of reporting to ECCC-CWS and NS NRR within 48 hours
SAR	Black ash or other plant SAR	NS NRR (Regional Biologist & Biodiversity Section, Wildlife Division). NS NRR Regional Biologist - Central Region: Dean Dillman Dillman.dean@novascotia.ca 902-897-7978 Wildlife Division: biodiversity@novascotia.ca 902-679-6091	Immediate phone call and email follow up.
		ECCC	Email notification of reporting to ECCC-CWS and NS NRR within 48 hours
SAR	Mainland Moose (all sightings)	NS NRR (Regional Biologist & Biodiversity Section, Wildlife Division). NS NRR Regional Biologist - Central Region: Dean Dillman	Immediate phone call and email follow up.

Category	Type of Observation	Regulatory Agencies (Personnel) to be Notified	Communication Type and Timing
		Dillman.dean@novascotia.ca 902-897-7978 Wildlife Division: biodiversity@novascotia.ca 902-679-6091	
		ECCC	Email notification of reporting to ECCC-CWS and NS NRR within 48 hours
SAR	Lichens (species as identified in Table 1 & 2 in the <i>At-risk Lichen Special Management Practice</i>)	NS NRR (Regional Biologist & Biodiversity Section, Wildlife Division). NS NRR Regional Biologist – Central Region: Dean Dillman Dillman.dean@novascotia.ca 902-897-7978 Wildlife Division: biodiversity@novascotia.ca 902-679-6091	Report (phone and email) within 24 hours
		ECCC	Email notification of reporting to ECCC-CWS and NS NRR within 48 hours
SOCC	Non-listed S1, S2, and S3 species	NS NRR (Regional Biologist & Biodiversity Section, Wildlife Division). NS NRR Regional Biologist – Central Region: Dean Dillman Dillman.dean@novascotia.ca 902-897-7978 Wildlife Division: biodiversity@novascotia.ca 902-679-6091	Report (email) within 1 week, unless involves mitigation for specified SOCC then report (phone and email) within 24 hours

Category	Type of Observation	Regulatory Agencies (Personnel) to be Notified	Communication Type and Timing
Other Wildlife	Noteworthy observations of wildlife	NS NRR (Regional Biologist & Biodiversity Section, Wildlife Division). NS NRR Regional Biologist: Central Region: Dean Dillman Dillman.dean@novascotia.ca 902-897-7978 Wildlife Division: biodiversity@novascotia.ca 902-679-6091	Report (email) within 1 week
Non-migratory birds	Potential/confirmed breeding activity inside or outside of project area within property	NS NRR (Regional Biologist & Biodiversity Section, Wildlife Division). NS NRR Regional Biologist – Central Region: Dean Dillman Dillman.dean@novascotia.ca 902-897-7978 Wildlife Division: biodiversity@novascotia.ca 902-679-6091	Consult prior to any further construction activities
Migratory Birds see also SAR	Potential or confirmed breeding activity inside or outside of project area within property	ECCC-CWS NS NRR (Regional Biologist & Biodiversity Section, Wildlife Division). NS NRR Regional Biologist – Central Region: Dean Dillman Dillman.dean@novascotia.ca 902-897-7978 Wildlife Division: biodiversity@novascotia.ca 902-679-6091	Consult prior to any further construction activities

APPENDIX U
DRAFT ADAPTIVE MANAGEMENT PLAN



DRAFT ADAPTIVE MANAGEMENT PLAN

Clydesdale Ridge Wind Project

July 2024

Clydesdale Holdings Ltd.
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Halifax, NS B3J 3M8
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1 Introduction

The Clydesdale Ridge Wind Project (the Project) is being developed by Clydesdale Holdings Ltd. (the Proponent). The Proponent represents a partnership between Natural Forces Developments Limited Partnership (Natural Forces) and Dalhousie Mountain Wind Energy Inc. The Proponent is further partnering with Mi'kmaq bands in Nova Scotia to ultimately develop, construct, own, and operate the Project.

The Project consists of up to 18 wind turbine generators (WTGs) and is situated adjacent to the operational Dalhousie Mountain Wind Farm, which is owned and operated by an affiliate of Dalhousie Mountain Wind Energy Inc. The Project is located near Mount Thom, Earltown, Loganville, and Berichan in both Colchester County and Pictou County. The proposed WTG locations and associated infrastructure are predominantly on privately-owned lands owned by multiple landowners, with a portion of the access road and collector lines traversing provincial Crown land. The private lands are secured under Lease, Option to Lease, and Easement. The Proponent has an active application for an Easement over the provincial Crown land. Due to the rated capacity of the Project, a provincial Class 1 Environmental Assessment (EA) is required. As part of the EA, the Proponent is proposing an Adaptive Management Plan to address issues that may arise during the post-construction monitoring efforts related to birds and bats at the turbine locations.

The Adaptive Management Plan for the Project will be finalized in consultation with Canadian Wildlife Service (CWS) and approved by Nova Scotia Environment and Climate Change (NSECC) and Nova Scotia Natural Resources and Renewables Wildlife Branch (NSNRR) prior to start of the Project's post-construction monitoring.

2 Purpose

The purpose of this Adaptive Management Plan is to provide NSECC with the Proponent's preliminary plan to address the risk of impacts to migrant avian species due to the perceived risk associated with the turbine height proposed.

The Adaptive Management Plan will:

- support science-based management of the Project to ensure wildlife and habitat impacts resulting from the Project are avoided, minimized, or offset;
- improve the understanding of interaction between wind turbines with heights near or over 200 metres and migrant avian species using evidence-based monitoring results in the field; and
- ensure that mitigation measures are implemented as required and that these measures are evaluated and continually improved.

3 Regulatory Framework

Below are the regulatory frameworks which are necessary to consider for the development of an Adaptive Management Plan.

3.1 Environment Act

Nova Scotia's Environmental Assessment Regulations - Environment Act requires all proposed wind projects with a combined design production rating equal to or greater than 2 MW to conduct a Class 1 EIA. As the Project will have a nameplate capacity greater than 2 MW, a Class 1 EIA was required. The EIA has been prepared for the Project in accordance with the Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia (NS Environmental Assessment Branch 2021).

3.2 Migratory Birds Convention Act

As a tall structure, there is a possibility for the Project to impact migratory birds. The Proponent recognizes their responsibility under the Federal *Migratory Birds Convention Act* and the implications should a migratory species be impacted.

Migratory birds and their eggs, nests, and young are protected under the *Migratory Birds Convention Act* (MBCA). Migratory birds protected by the MBCA generally include all seabirds (except cormorants and pelicans), all waterfowl, all shorebirds, and most land birds (birds with principally terrestrial life cycles). The list of species protected by the MBCA can be found at: <https://www.canada.ca/en/environment-climate-change/services/migratory-birds-legal-protection/list.html>. Bird species not listed may also be protected under other legislation.

Under Section 6 of the *Migratory Birds Regulations* (MBR), it is forbidden to disturb, destroy, or take a nest or egg of a migratory bird; or to be in possession of a live migratory bird, or its carcass, skin, nest or egg, except under authority of a permit. It is important to note that under the MBR, no permits can be issued for the incidental take of migratory birds caused by development projects or other economic activities.

3.3 Federal Species at Risk Act

The federal Species at Risk Act is meant to prevent wildlife species in Canada from extinction and to provide for the recovery of species that are at risk as a result of human activity. Under the federal SARA, the following prohibitions apply to the Project:

No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species.

No person shall possess, collect, buy, sell or trade an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species, or any part or derivative of such an individual.

3.4 Nova Scotia Endangered Species Act

The purpose of this Act is to prevent wildlife species from being extirpated from the Province, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to conserve species of special concern to prevent them from becoming endangered or threatened. Under the Nova Scotia Endangered Species Act, the following prohibitions apply to the Project:

No person shall

- (a) kill, injure, possess, disturb, take or interfere with or attempt to kill, injure, possess, disturb, take or interfere with an endangered or threatened species or any part or product thereof;
- (b) possess for sale, offer for sale, sell, buy, trade or barter an endangered or threatened species or any part or product thereof;
- (c) destroy, disturb or interfere with or attempt to destroy, disturb or interfere with the specific dwelling place or area occupied or habitually occupied by one or more individuals or populations of an endangered or threatened species, including the nest, nest shelter, hibernaculum or den of an endangered or threatened species;

3.5 Wildlife Act

The *Wildlife Act* provides protection to all wildlife including any vertebrate animal or bird or any hybrid offspring of a vertebrate animal or bird, excluding fish and the hybrid offspring of fish, of any species of vertebrate animal or bird that is usually wild by nature in the Province, whether or not the vertebrate animal or bird is bred or reared in captivity.

This Act also applies to all hunting and angling. No employee or contractor for the Project will be permitted to hunt on the project lands during construction. Following the and Wildlife Act regulations, appropriate “No Hunting” signs will be posted during construction for worker safety.

4 Adaptive Management

Adaptive Management is defined as a systematic science-based process intended to improve policies and practices by learning from the outcome of management decisions and to reduce scientific uncertainty (MOE, 2018). It further allows for adaptability in monitoring, management actions based on observed outcomes, and utilizes feedback from assessment of project design and operation.

The wind industry has advanced in recent years with onshore wind turbines growing larger with current blade tips reaching up to 205m. Though literature on altitudinal distribution of migratory species (Mabee, 2006) demonstrates that an increased risk to migratory birds is not

expected as turbines increase from 100m to 150m and up to ~200m, this Adaptive Management Plan outlines the monitoring, consultation, and mitigation that will be implemented based on the observed impact. This plan will ensure that there is an increased level of effort in management of potential impacts through mitigation and offset approaches appropriate to impacts detected on site. This in turn will provide additional certainty that impacts beyond those predicted through the EIA process will be assessed and addressed for the Project which proposes to use a turbine with a maximum height of 205 m.

As stated in *Wind Turbines and Birds - A Guidance Document for Environmental Assessment* (CWS, 2006), “adopting an adaptive management approach and reporting on the successes and the failures of certain methods will help guide future research and development in wind energy.” The Proponent acknowledges that wind energy is a growing and evolving field where research is constantly being conducted. This program will monitor any new literature on the topic and will aim to implement updates to technologies, methodologies and understandings of the effects of wind projects.

4.1 Management guidelines

This proposed plan demonstrates a tiered approach, and should problematic impacts be observed, a form of assessment and mitigation will be required based on the severity of impact. As an adaptive management plan is meant to be flexible to adapt to the situation at hand, all scenarios in which impacts are observed will be reported and further consultation will provide an additional safeguard to arrange for the implementation of the appropriate mitigation measures if required.

4.2 Management response

Avoidance

The first step in adaptive management is to implement measures that will help to avoid impacts which can be effectively accomplished within the initial site finding phase of project development. Throughout the development phase of the Project the following measures have been implemented to avoid impacts on migratory species:

- Siting the Project away from Important Bird Areas;
- Situating the project on primarily previously disturbed lands;
- Siting turbines at least 30 m from wetlands and watercourses;
- Avoiding wetland disturbance with transmission line poles and,
- Micro-siting all infrastructure away from observed species at risk and potential species at risk (SAR) habitats, wherever feasible.

Mitigation

If impacts to migratory species due to the turbine cannot be avoided, the second step in adaptive management is mitigation. Mitigation measures can be implemented during the construction and operation phase of the Project which have been found to effectively reduce

impacts. The mitigation measures proposed throughout the EIA process that will be implemented for the Project include the following:

- Reducing the footprint of the Project through selection of a turbine model, that can produce more energy thus reducing the number of turbines on site;
- Using the minimum amount of pilot warning and obstruction avoidance lighting as determined by Transport Canada;
- Using lights with short flash durations and ability to emit no light during the “off phase” of the flash;
- Using lights that operate at the minimum intensity and minimum frequency allowable by Transport Canada;
- Ensuring maintenance protocols instruct workers to turn off all work lights upon leaving the site; and
- Minimizing potential interaction with ground nesting species by revegetating the project area either naturally occurring or using native local vegetation, where possible.

As the Project becomes operational, and post-construction monitoring is conducted to determine impacts, additional mitigation may be required. There are several mitigation measures that can be implemented during operation to support efforts to reduce unanticipated mortalities. The Proponent is proposing to implement the tiered adaptive management approach to address unanticipated impacts, however the Proponent will consult with NSECC to determine the most appropriate response when an unanticipated mortality event occurs on site.

Outlined below are the proposed management responses. Management responses can be adapted after a single spring or fall monitoring event, season or after the full year. NSECC and CWS will be notified within 24 hours should a mortality event occur, and a formal report following each year of monitoring will be prepared and shared with NSECC. A mortality event refers to the mortality of an individual migratory SAR bird or 10 or more migratory birds in one night.

Tier 1 Management Response

The management response for Tier 1 will include the typical post-construction mortality monitoring as outlined in the EIA and discussed with NSECC. Generally, this includes two years of post-construction carcass searches. If continued observance over these two years shows low impacts, reduced monitoring or no additional monitoring may be implemented.

Tier 2 Management Response

If, during any post-construction monitoring period, unanticipated impacts are observed, further consultation with NSECC and CWS will occur to determine the appropriate response. Tier 2 management response includes passive mitigation measures. The mitigation implemented at Tier 2 will provide additional information on the potential cause of impact. These mitigations may be implemented at individual turbine locations or across an area, up to the entire Project. The level of effort, based on the observed impact, will be further determined with NSECC and CWS. Some measures proposed for this tier include the following:

- Cause and effect analysis;

- Extended monitoring program; and
- Increased reporting frequency.

The results of the investigatory measures will inform if active mitigation measures are required, and it will inform the appropriate form of mitigative measures to address the impacts observed on site, and how best to apply them.

Tier 3 Management Response

If, during any post-construction monitoring period, impacts are observed that are considered significant after further consultation with NSECC and CWS, additional active mitigation will be implemented. These mitigations may be implemented at individual turbine locations or across an area, up to the entire Project. The level of effort and mitigation approaches will be determined based on the observed impact and in consultation with NSECC and CWS. Mitigation measures proposed for this tier may include the following should they be deemed necessary through consultation with the appropriate regulatory bodies:

- Cause and effect analysis;
- Extended monitoring program;
- Increased reporting frequency;
- Blade feathering;
- Increased cut-in speeds during specific time periods or conditions; and
- Extended monitoring program to measure mitigation effectiveness.

5 Draft Post-Construction Monitoring and Reporting

The proposed protocols outlined below will be finalized in consultation with NSECC and CWS for approval prior to being implemented. As mentioned in Section 4, the Proponent will consult with regulators to implement updates to methodology based on most up-to-date research when in the operational phase.

As there are no province-specific guidelines for Nova Scotia, mortality surveys will be designed in consultation with NSECC and CWS, and will be conducted according to the protocols set out by New Brunswick Post Construction Bat and Bird Mortality Survey Guidelines for Wind Farm Development (2011). Scavenger rates and searcher efficiency trials will also be implemented according to the recommended protocols. A request for a scientific collection permit will be submitted to appropriate regulatory bodies prior to the commencement of the surveys.

Carcass Searches

The following schedule and search effort for bird and bat carcass searches have been established following New Brunswick Post Construction Bat and Bird Mortality Survey Guidelines for Wind Farm Development (2011):

- Three times a week (Monday, Wednesday, Friday) from March 31st – October 31st

An intensive survey area, or grid, of the maximum extent of the cleared area surrounding the turbine. The grid will be divided into a series of transects, spaced approximately five-meters apart, starting at the centre of the grid. In total, the grid will be divided into a minimum of 21 transects depending on the cleared area surrounding the turbine. Transects will be marked on each end with pin flags, of alternating color, and tracked with a GPS for simple and accurate repetition of surveys.

During each carcass search, all relevant information such as wind direction and other weather-related factors (fog, snow, etc.) will be recorded. In addition to weather related factors, the search area, date, and search time for the turbine will be recorded. Furthermore, for every carcass found, the following information will be recorded:

- Project Name and Location;
- A unique carcass identification number;
- Turbine/met tower or reference plot number;
- Observer;
- Date and time collected;
- Species;
- Sex;
- Age class;
- An in-situ photograph of the specimen;
- Habitat type surrounding the turbine location;
- Distance to and identity of other nearby structures (i.e. fence, power-line, substation); and
- Carcass condition and any comments indicating the suspected cause of mortality.

Carcasses will be collected and kept frozen until the appropriate disposal method is determined by NSDRR. If required, they will be transferred to the appropriate research entity for authentication and retention.

Scavenger Trials

Carcass removal rates by scavengers will be assessed during carcass searches in each season. In each season, carcasses will be placed in the grid and surrounding vicinity for scavenger trials. Some carcasses may be placed on access roads, to reduce the effect of artificial supplementation of scavengers, which has been shown to increase scavenger activity. Carcasses used for scavenger trials will include small chicks or appropriate surrogate carcasses that are spotted or darker in colour.

Carcasses will be laid out in the grid and coordinates recorded. Carcasses will be placed before daylight, using gloves, and will be thawed. Carcasses will be discreetly marked with a unique identification number and assessed for persistence over various intervals (typically persistence is checked during the 4 carcass searches following placement). Carcasses will be randomly distributed on the turbine grid and associated access road. Each trial will include carcasses distributed across a range of habitats. If scavenger rates approach 60% during the scavenger removal trials, the Proponent will consult with NSDNRR to determine whether

carcass surveys should be continued or modified, as very high scavenger activity can bias the results of mortality surveys.

Results from the carcass removal trials will be used to calculate an overall scavenger correction factor. The scavenger correction factor will combine data from each seasonal scavenger trial to calculate an overall scavenger correction factor for the year. In addition, scavenger correction factors will be calculated for each season to help in discussion of seasonal effects of scavenger rates.

Searcher Efficiency Trials

Carcasses will be placed at random locations within the search area to test searcher efficiency. Carcasses will be placed by a ‘tester’ unknown to the searcher and the location of each carcass will be recorded to retrieve the carcass should it not be found by the searcher. Trial carcasses will be distributed across substrates and habitat types. The searcher efficiency trials will be completed throughout the carcass searching program (once every season: spring, summer, and fall) for all searchers involved in the carcass searching program. Carcasses used for searcher efficiency trials will include small chicks or suitable surrogates that are spotted or darker in colour. All carcasses used in searcher efficiency trials will be discretely marked to ensure that the searcher was aware that the carcass was part of the searcher efficiency trial, rather than a collision victim. Carcasses will be marked with a rubber band or twist-tie wrapped around a foot.

Any carcasses that are not found will be retrieved immediately after the search to determine whether they were scavenged or overlooked. Data recorded for each bird placed will include:

- Date, time and location it was placed, along with the species name;
- Date and time it was searched for; and,
- Whether it was found, overlooked or scavenged, along with the name of the searcher.

Reporting and Communication

The Proponent will stay in regular contact with the assigned contacts at NSECC and NSNRR.

After each spring and fall monitoring period, the Proponent will provide an email update on the results of the monitoring and any impact observed to NSECC to forward onto applicable regulators such as NSNRR and CWS. Though an update will be provided after each monitoring period, should a significant mortality event occur, NSECC will be notified within 24 hours.

In addition to seasonal updates, a formal annual report will be prepared by the third-party consultant conducting post-construction monitoring. This report will include the methods (to be approved by NSECC and CWS), monitoring results, and recommendations from the Spring and Fall monitoring period and will include all applicable correction factors to determine accurate impacts related to the Project operation. Consultation with NSECC, NSNRR, and CWS will be ongoing throughout the post-construction monitoring period and additional updates can also be provided upon request.

6 Closure

This Adaptive Management Plan is being proposed for the Project. The Proponent is proposing this Plan to closely monitoring the in-situ impacts of the proposed turbines.

The approach presented in this Plan has been adapted from the Saskatchewan (2018) *Adaptive Management Guidelines for Saskatchewan Wind Energy Projects*. This adaptive management approach has been implemented in western jurisdictions as a solution to monitor the observed impacts from taller turbines.

The EIA conducted for the Project anticipates low impact to avian species. However, should there be unanticipated impacts, this Plan will ensure that an increase level of effort in mitigation and offset approaches appropriate to the impacts detected on site are implemented. This in turn will provide additional certainty that impacts beyond those predicted through the EIA process will be assessed and mitigated for the Project.

The final Adaptive Management Plan will be developed in consultation with CWS and approved by NSECC prior to the Project's commissioning date.

7 References

CWS (2006) Wind turbines and birds: A guidance document for environmental assessment.

CWS (2007) Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds

Erickson, W.P. et al., (2014) A comprehensive analysis of small-passerine fatalities from collision with turbines at wind energy facilities. PLoS ONE 9:e107491.

Mabee et al. (2006) Nocturnal Bird Migration Over an Appalachian Ridge at a Proposed Wind Power Project. Wildlife Society Bulletin 34: 682-690

New Brunswick Department of Natural Resources and Energy Development (2011) Post Construction Nat and Bird Mortality Survey Guidelines for Wind Farm Development in New Brunswick.

Nova Scotia Environmental Assessment Branch (2021) Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia.

Saskatchewan Ministry of Environment (2018) Adaptive Management Guidelines for Saskatchewan Wind Energy Projects.

Zimmerling, J. et al. (2013) Canadian estimate of bird mortality due to collisions and direct habitat loss associated with wind turbine developments. Avian Conservation and Ecology 8(2): 10.

APPENDIX V
DRAFT SURFACE WATER MANAGEMENT PLAN



DRAFT SURFACE WATER MANAGEMENT PLAN

Clydesdale Ridge Wind Project

July 2024

Clydesdale Holdings Ltd.
1701 Hollis St Suite 1200
Halifax, NS B3J 3M8
naturalforces.ca

Introduction

The Clydesdale Ridge Wind Project (the Project) is being developed by Clydesdale Holdings Ltd. (the Proponent). The Proponent represents a partnership between Natural Forces Developments Limited Partnership (Natural Forces) and Dalhousie Mountain Wind Energy Inc. The Proponent is further partnering with Mi'kmaq bands in Nova Scotia to ultimately develop, construct, own, and operate the Project.

The Project consists of up to 18 wind turbine generators (WTGs) and is situated adjacent to the operational Dalhousie Mountain Wind Farm, which is owned and operated by an affiliate of Dalhousie Mountain Wind Energy Inc. The Project is located near Mount Thom, Earltown, Loganville, and Berichan in both Colchester County and Pictou County. The proposed WTG locations and associated infrastructure are predominantly on privately-owned lands owned by multiple landowners, with a portion of the access road and collector lines traversing provincial Crown land. The private lands are secured under Lease, Option to Lease, and Easement. The Proponent has an active application for an Easement over the provincial Crown land. Due to the rated capacity of the Project, a provincial Class 1 Environmental Assessment (EA) is required.

This document outlines the Surface Water Management Plan (SWMP or the Plan) that will be implemented during the construction and decommissioning of the Project. The finalized plan will be developed in consultation with Nova Scotia Environment and Climate Change (NSECC).

Objective

The objective of the Surface Water Management Plan is to identify and prevent potential impacts to the local hydrological environment. In order to deliver this Plan, the Proponent will engage qualified engineers to deliver the finalized site-specific surface water management designs.

Summary of Plan Figures

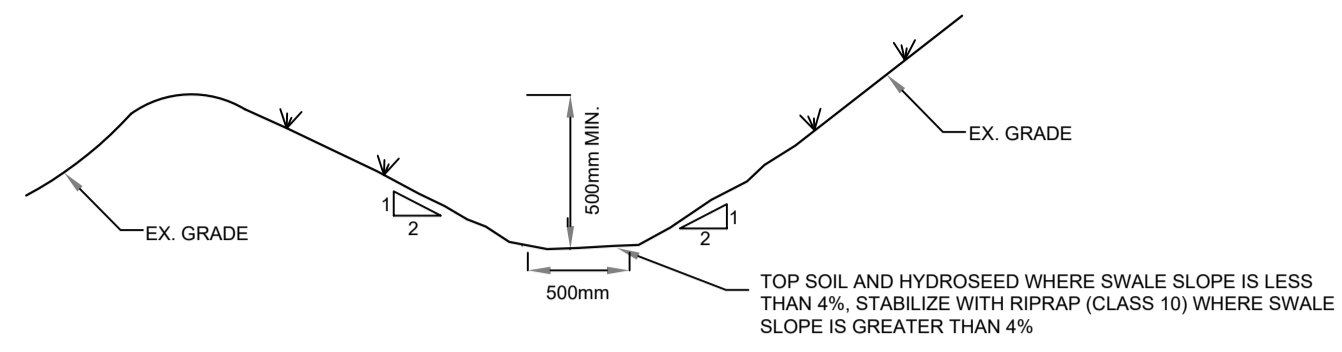
The following summary serves to provide detail to the attached drawings and the design to be finalized prior to construction.

To manage surface water and prevent erosion at the site, drainage culverts will be built. These culverts will be constructed along the access roads and will direct the water into nearby streams or retention ponds. Each proposed culvert will be associated with a drainage area, indicated clearly on the finalized design. Surface water flow direction will be indicated as well. Details of these areas and specifications for individual culverts will be provided, including the size of the area, and the flow rate, slope, length, diameter and capacity of culvert. These designs will be determined based on surface water models by qualified personnel and will be made to withstand heavy rainfalls to prevent flooding.

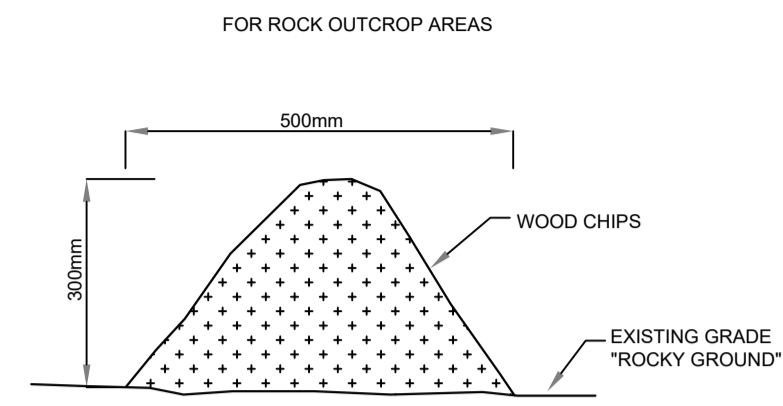
The diagrams of erosion and sediment control strategies shown in ESC-02 (Erosion and Sedimentation) provide typical general designs for swales, berms, ditches and silt fencing.

The Culvert Installation Detail and Pump Intake Detail (Figures F and G) illustrate an example of the culvert installation process. Project-specific drawings will be provided prior to construction. All designs will be in accordance with NSECC requirements and will be adhered to as stringently as feasible while accounting for the terrain and topography. Any unnecessary alterations to the existing surface water system have not been considered.

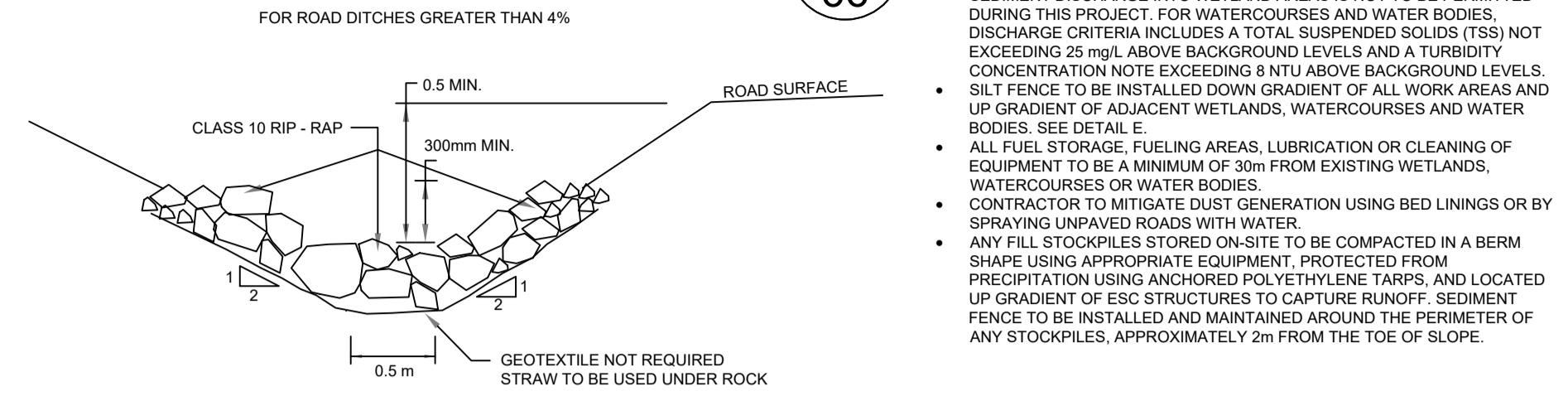
TURBINE PAD DRAINAGE SWALE A 66



TYPICAL WOODCHIP BERM B 66



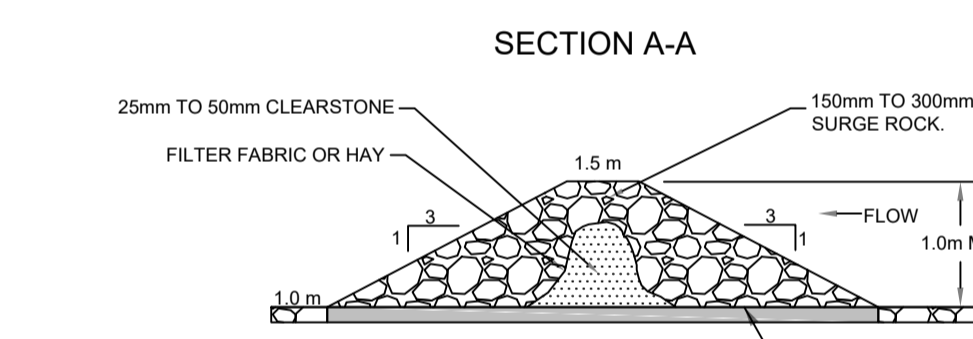
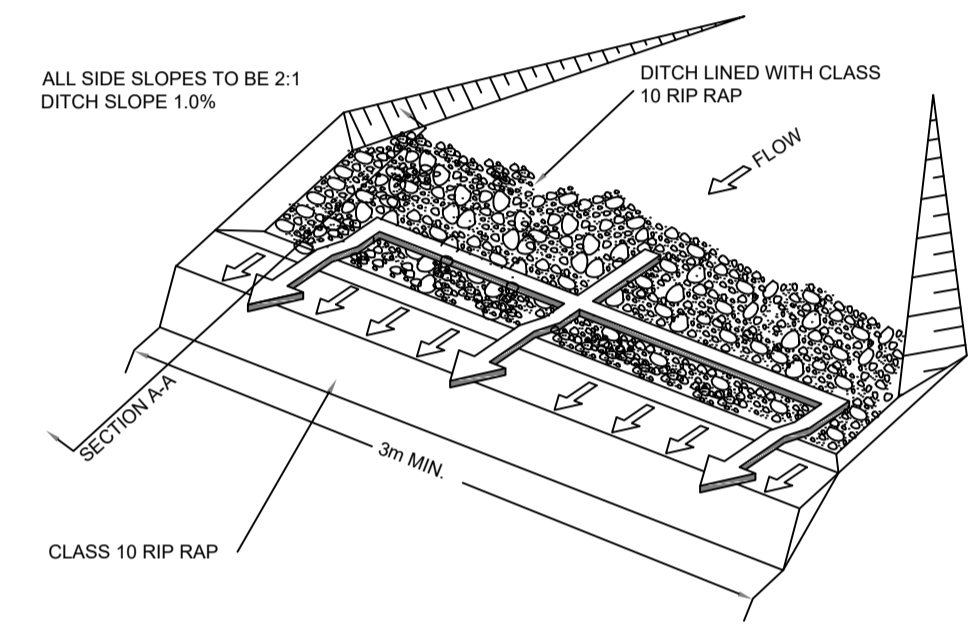
ROCKLINED DITCH DETAIL C 66



- NOTES:**
- SEDIMENT DISCHARGE INTO WETLAND AREAS IS NOT TO BE PERMITTED DURING THIS PROJECT FOR WATERCOURSES AND WATER BODIES. DISCHARGE CRITERIA INCLUDES A TOTAL SUSPENDED SOLIDS (TSS) NOT EXCEEDING 25 mg/L ABOVE BACKGROUND LEVELS AND A TURBIDITY CONCENTRATION NOTE EXCEEDING 8 NTU ABOVE BACKGROUND LEVELS.
 - SILT FENCE TO BE INSTALLED DOWN GRADIENT OF ALL WORK AREAS AND UP GRADIENT OF ADJACENT WETLANDS, WATERCOURSES AND WATER BODIES. SEE DETAIL E.
 - ALL FUEL STORAGE, FUELING AREAS, LUBRICATION OR CLEANING OF EQUIPMENT TO BE A MINIMUM OF 30m FROM EXISTING WETLANDS, WATERCOURSES OR WATER BODIES.
 - CONTRACTOR TO MITIGATE DUST GENERATION USING BED LININGS OR BY SPRAYING UNPAVED ROADS WITH WATER.
 - ANY FILL STOCKPILES STORED ON-SITE TO BE COMPACTED IN A BERM SHAPE USING APPROPRIATE EQUIPMENT, PROTECTED FROM PRECIPITATION USING ANCHORED POLYETHYLENE TARP, AND LOCATED UP GRADIENT OF ESC STRUCTURES TO CAPTURE RUNOFF. SEDIMENT FENCE TO BE INSTALLED AND MAINTAINED AROUND THE PERIMETER OF ANY STOCKPILES, APPROXIMATELY 2m FROM THE TOE OF SLOPE.

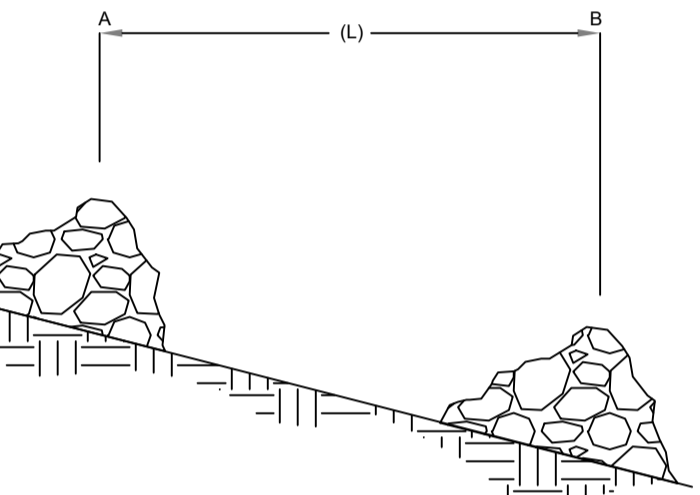
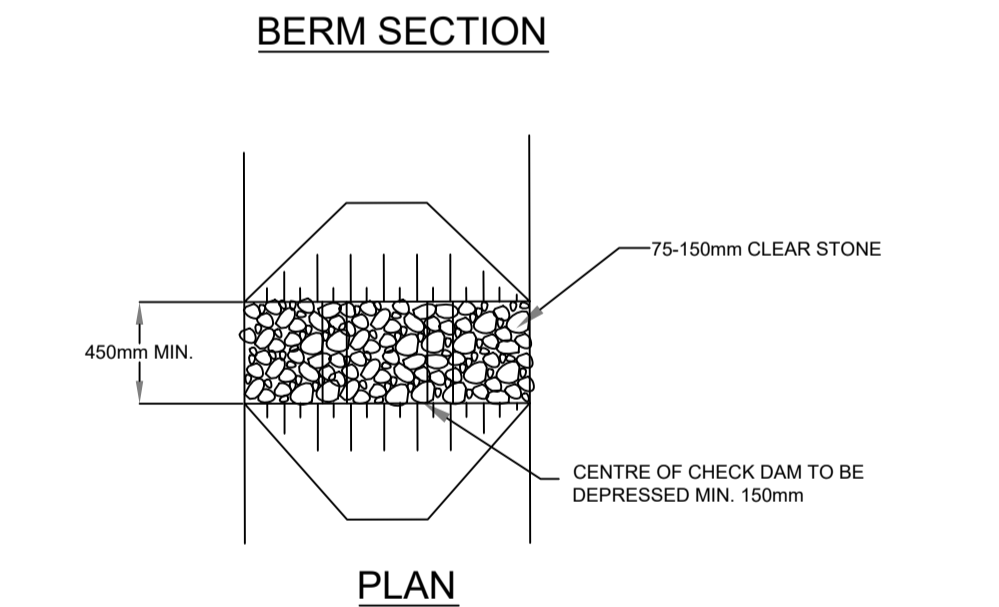
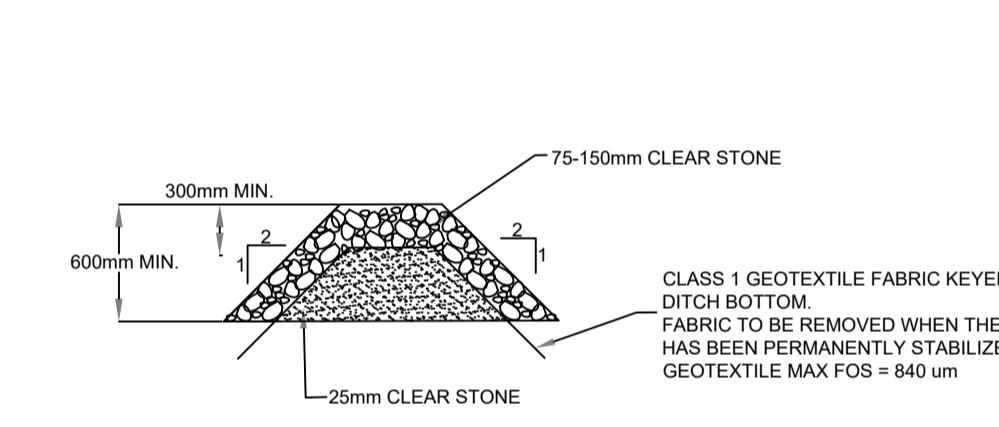
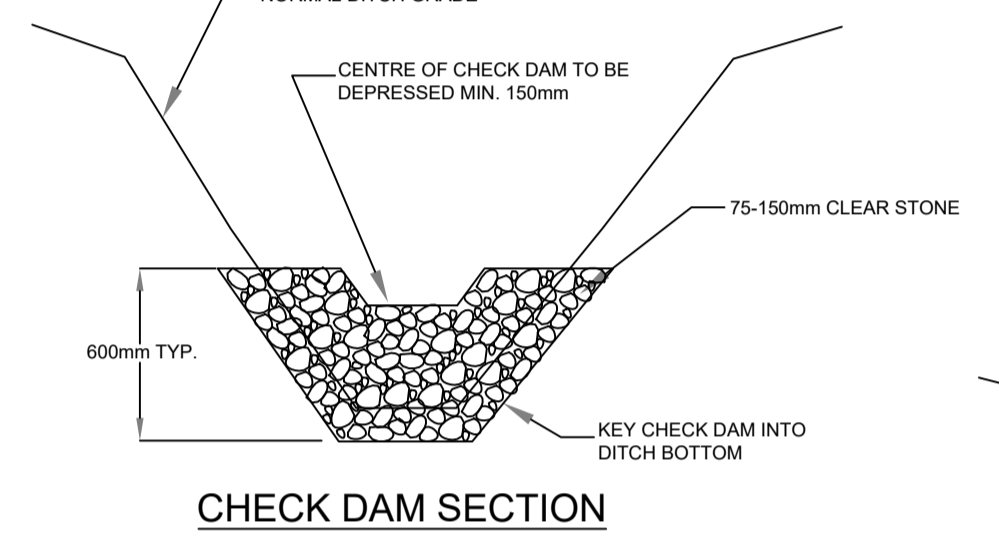
LEGEND		
EXISTING		PROPOSED
-10	MAJOR CONTOUR	-10
-10	MINOR CONTOUR	-10
---	EASEMENT	---
---	RIGHT OF WAY	---
---	LOT LINE	---
---	SILT FENCE	---
---	DIVERSION DITCH	---
---	RUMBLE STRIP	---

DISPERSION BERM DETAIL D 66



IMPERMEABLE ON-SITE MATERIAL COMPACTED TO CREATE IMPERMEABLE BARRIER. BERM SURFACE TO BE STABILIZED IMMEDIATELY AFTER CONSTRUCTION WITH HYDROSEED AND MULCH.

FILTER FABRIC BERM AND CHECK DAM DETAIL E 66

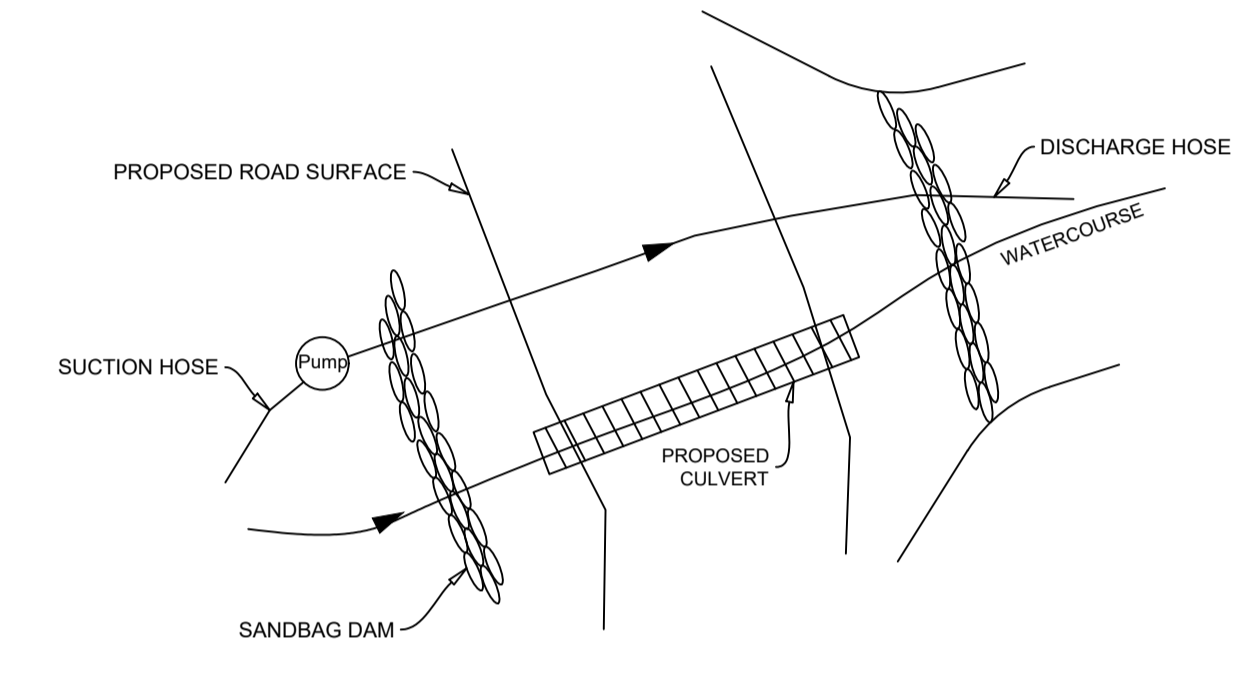


SPACING BETWEEN CHECK DAMS
DEFINITION - SMALL DAM CONSTRUCTED ACROSS A SWALE OR DRAINAGE DITCH.
PURPOSE - TO REDUCE THE VELOCITY OF STORM WATER FLOWS AND EROSION OF THE SWALE OR DITCH.

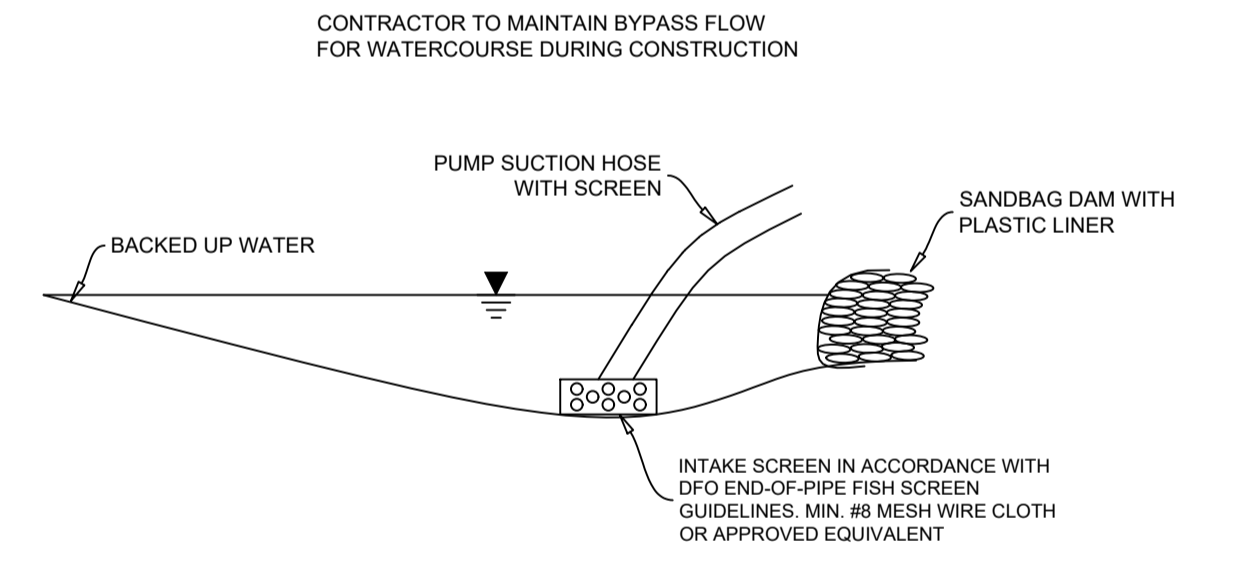
GRADE (%)	L (M)
0 - 7	40
7 - 9	20
9 - 11	10
11 - 21*	5

* SLOPES GREATER THAN 14% MAY UTILIZE A RIP RAP LINED CHANNEL AS AN ALTERNATIVE TO CHECK DAMS

CULVERT INSTALLATION DETAIL F 66

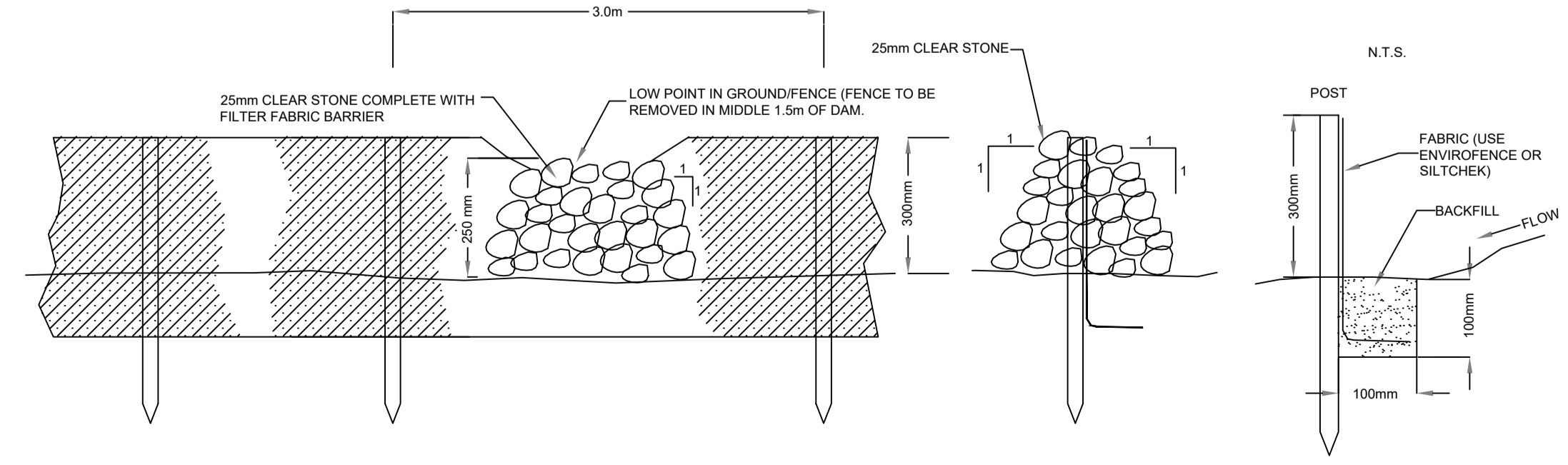


PUMP INTAKE DETAIL G 66



CONTRACTOR TO MAINTAIN BYPASS FLOW FOR WATERCOURSE DURING CONSTRUCTION

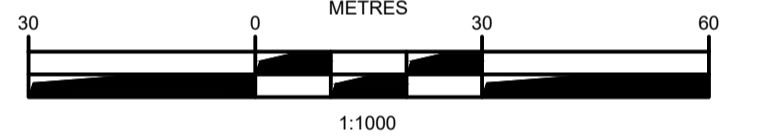
TYPICAL SILT FENCE DETAIL H 66



GENERAL EROSION AND SEDIMENT CONTROL NOTES

- EXPOSED SOIL TO BE MINIMIZED AT ALL TIMES DURING CONSTRUCTION TO LIMIT SEDIMENT LADEN RUNOFF. THIS IS TO BE ACCOMPLISHED BY COMPLETING ALL WORK IN A GIVEN AREA ONCE EXCAVATION HAS BEGUN BEFORE DISTURBING ADDITIONAL SOIL. CONTRACTOR IS TO BE AWARE OF CURRENT WEATHER FORECASTS AND PLAN SOIL STABILIZATION ACCORDINGLY.
- ALL WORKS TO BE IN ACCORDANCE WITH NOVA SCOTIA DEPARTMENT OF ENVIRONMENT REQUIREMENTS.
- CONTRACTOR TO ACQUIRE ALL PERMITS REQUIRED TO PERFORM WORK AND TO COMPLY WITH ALL PERMIT REQUIREMENTS DURING CONSTRUCTION.
- CONTRACTOR TO PROTECT NATURAL WATERCOURSES FROM SILT LADEN RUNOFF FROM CONSTRUCTION SITE. CONSTRUCTION PROCEDURES CAN BE FOUND IN THE CURRENT EDITION OF "EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR CONSTRUCTION SITES" BY THE NOVA SCOTIA DEPARTMENT OF ENVIRONMENT.
- CONTRACTOR TO ENSURE THAT ALL EXPOSED AREAS ARE STABILIZED PRIOR TO RAINFALL EVENTS BY CHECKING ENVIRONMENT CANADA FORECASTS (https://weather.gc.ca/canada_e.html).
- CONTRACTOR TO PERFORM WEEKLY INSPECTIONS OF SEDIMENT CONTROL MEASURES AND MAKE REPAIRS AS NEEDED. ADDITIONAL INSPECTION AND REPAIR TO BE CARRIED OUT BEFORE AND AFTER ANY RAINFALL EXCEEDING 10mm. A LOG OF EACH INSPECTION AND REPAIR IS TO BE KEPT ALONG WITH A WEEKLY REPORT OF EXPOSED AREAS.
- TRIBUTARY STORM RUNOFF FROM SITE TO BE DIRECTED INTO SEDIMENT CONTROL DEVICES DURING CONSTRUCTION.
- CONTRACTOR TO CONSTRUCT AND MAINTAIN DIVERSION DITCHES THROUGH AND AROUND THE SITE TO MINIMIZE CONTAMINATION OF CLEAN WATER.
- CONTRACTOR TO HAVE ADDITIONAL SEDIMENT CONTROL MEASURES ON SITE INCLUDING SILT FENCE, BALED HAY, AND LOOSE HAY/MULCH TO MAINTAIN OR INSTALL CONTROL MEASURES AS REQUIRED.
- EXPOSED SURFACES TO BE COVERED WITH HAY, MULCH, OR WOOD CHIPS TO LIMIT SEDIMENT RUNOFF.
- CONTRACTOR MAY SUBSTITUTE WOOD CHIP BERM FOR SILT FENCE IN ROCKY AREAS WHERE SILT FENCE CANNOT BE INSTALLED.
- SEDIMENTATION BERMS AND PONDS TO REMAIN IN SERVICE UNTIL PROJECT ENGINEER OR THE MUNICIPALITY REQUESTS THEIR REMOVAL. THIS WILL ONLY OCCUR AFTER LOT AND BUILDING CONSTRUCTION IS COMPLETE.
- SEDIMENTATION BERMS AND PONDS TO BE REMOVED IN THE FOLLOWING ORDER. LEVEL OFF BERMS, HYDROSEED AND COVER ALL EXPOSED AREAS WITH HAY, THEN FILL IN PONDS.
- UPON COMPLETION OF GRADING ACTIVITY, ALL LOT DRAINAGE EASEMENTS ARE TO BE HYDROSEED AND MULCHED.
- TOPSOIL AND HYDROSEED TO BE PLACED ON ALL AREAS NOT FINISHED WITH ASPHALT, CONCRETE, GRAVEL, OR SOD.
- ACCESS ROADS TO SITE ARE TO BE MAINTAINED WITH CLEAN GRAVEL APPLIED PERIODICALLY TO COVER MUDDY AREAS. CLEANING OF ADJACENT STREETS IS THE RESPONSIBILITY OF THE CONTRACTOR AS DIRECTED BY THE ENGINEER.
- VEHICLE ACCESS TO CONSTRUCTION SITE TO BE RESTRICTED.
- STABILIZE ON-SITE STOCKPILES USING APPROPRIATE MEASURES (SILT FENCE, HAY, TARPS, ETC.)
- SITE ACTIVITY TO ADHERE TO REQUIREMENTS OF HALIFAX REGIONAL MUNICIPALITY GRADE ALTERATION BY-LAW.
- ALL SEDIMENT CONTROL MEASURES TO BE OPERATIONAL OVER ENTIRE CONSTRUCTION PERIOD.
- SEDIMENTATION AND EROSION CONTROL MEASURES ARE SUBJECT TO CHANGE. ADDITIONAL MEASURES MAY BE REQUIRED DEPENDING ON SITE CONDITIONS DURING CONSTRUCTION.

DRAFT
NOT FOR CONSTRUCTION



ISSUE	DATE	DESCRIPTION
1	MAR. 06, 2023	ISSUED FOR REVIEW

DESIGNPOINT
engineering • surveying • solutions

902.832.5597 designpoint.ca



CLIENT

natural forces
Delivering renewable energy for communities

PROJECT DESCRIPTION

WINDFARM

BENJAMINS MILL, NOVA SCOTIA

SHEET DESCRIPTION

EROSION AND SEDIMENTATION

Drawn J. MORRISSEY	Engineer N. FOUGERE	Project No. 22-411	Drawing No. ESC-02
Scale AS NOTED	Filename 22-411_ESC.dwg		66 of 67