

**DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF LAND & WATER QUALITY**

FOR DEP USE  
L- \_\_\_\_\_  
ATS# \_\_\_\_\_  
Fees Paid \_\_\_\_\_  
Date Received \_\_\_\_\_

**STORMWATER APPLICATION FORM PLEASE TYPE OR PRINT IN INK.**

<b>This application is for: (Check the one that applies):</b>		<input checked="" type="checkbox"/> <b>New application</b>		<input type="checkbox"/> <b>Amendment</b>	
<b>1. Name of Applicant:</b>	RoxWind LLC		<b>5. Name of Agent:</b>	Brooke Barnes	
<b>2. Applicant's Mailing Address:</b>	c/o Lindsay Deane-Mayer Palmer Capital Corporation 13 Elm Street, Suite 200 Cohasset, MA 02025		<b>6. Agent's Mailing Address:</b>	Stantec 30 Park Drive Topsham, ME 04086	
<b>3. Applicant's Phone #:</b>	781-383-3200		<b>7. Agent's Phone # :</b>	207-406-5461	
<b>4. Email address (REQUIRED-license will be sent via email):</b>	Lindsay@palmcap.com		<b>8. E-mail address: (REQUIRED-license will be sent via email)</b>	brooke.barnes@stantec.com	
<b>9. Location of Project: ( Road, Street, Rt #)</b>	Horseshoe Valley Road		<b>10. Town:</b>	Roxbury	
			<b>11. County:</b>	Oxford	
			<b>13. Amount of Disturbed land:</b>	Total Amt.= <u>18.4</u> acres	
<b>12. Type of Direct Watershed: (Check all that apply)</b>	<input type="checkbox"/> Lake not most at risk <input type="checkbox"/> Lake most at risk <input type="checkbox"/> Lake most at risk, severely blooming <input type="checkbox"/> River, stream or brook <input type="checkbox"/> Urban impaired stream <input type="checkbox"/> Freshwater wetland <input type="checkbox"/> Coastal wetland <input type="checkbox"/> Wellhead of public water supply		<b>14. Amount of Developed Area:</b>	<input type="checkbox"/> 1 or more acres, but less than 5 acres <input checked="" type="checkbox"/> 5 acres or more Total Amt.= <u>18.4</u> acres	
			<b>15. Amount of Impervious Area:</b>	<input type="checkbox"/> less than 20,000 sq.ft. <input type="checkbox"/> 20,000 sq. ft. to 1 acre <input checked="" type="checkbox"/> 1 to 3 acres <input type="checkbox"/> 3 or more acres Total Amount of impervious Acres = <u>2.8</u>	
<b>16. Applicable Standards: (Check all that apply)</b>	<input type="checkbox"/> Stormwater PBR <input checked="" type="checkbox"/> Basic standards <input checked="" type="checkbox"/> General standards: BMP <input type="checkbox"/> General standards: phosphorus <input checked="" type="checkbox"/> Flooding standard <input type="checkbox"/> Urban impaired stream standards <input type="checkbox"/> Other: _____		<b>17. Type of Stormwater Control:</b>	<input checked="" type="checkbox"/> Vegetative (e.g. buffers) <input checked="" type="checkbox"/> Structural (e.g. underdrained filters, ponds, infiltration structures)	
<b>18. Exceptions &amp;/or Waivers Requested:</b>	<b>BMP Standards ▼</b>		<b>Urban impaired stream standard ▼</b>		<b>Flooding Standard ▼</b>
	<input type="checkbox"/> Pretreatment measures <input type="checkbox"/> Discharge to ocean/major river segment <input checked="" type="checkbox"/> Linear portion of project <input checked="" type="checkbox"/> Utility corridor <input type="checkbox"/> Redevelopment		<input type="checkbox"/> Developed area not landscaped or impervious <input type="checkbox"/> Redevelopment		<input type="checkbox"/> Discharge to ocean/major river segment <input checked="" type="checkbox"/> Insignificant increase in peak flow
<b>19. Brief Project Description:</b>	Development of a small-scale wind energy project, consisting of four wind turbines, underground and overhead collection lines, approximately 1.7 miles of access and crane roads, turbine pads, and transmission line upgrades.				
<b>20. Size of Lot or Parcel:</b>	<input type="checkbox"/> _____ sq. feet, or	<input type="checkbox"/> _____ acres	<b>UTM Easting:</b>		<b>UTM Northing:</b>
<b>21. Title, Right or Interest:</b>	<input type="checkbox"/> own <input checked="" type="checkbox"/> lease <input type="checkbox"/> purchase option <input type="checkbox"/> written agreement				
<b>22. Deed Reference Numbers:</b>	Book#: 3640	Page: 226	<b>24. Map and Lot Numbers:</b>		Map #: 02      Lot #: 34 & 35
<b>23. DEP Staff Previously Contacted:</b>	Dawn Hallowell		<b>25. Project started prior to application?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>Completed?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>SIGNATURES / CERTIFICATIONS ON PAGE 2</b>					


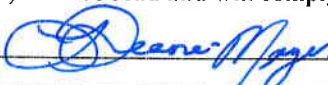
**STORMWATER APPLICATION FORM**

26. Resubmission of Application?	<input type="checkbox"/> Yes → <input checked="" type="checkbox"/> No	If yes, previous application #		Previous project manager:	
27. Written Notice of Violation?	<input type="checkbox"/> Yes → <input checked="" type="checkbox"/> No	If yes, name of DEP enforcement staff involved:			
28. Detailed Directions to the Project Site:	7.7 miles north on Route 120 from Rumford to Horseshoe Valley Road on left; 1/4 mile to log yard on left.				
29. Stormwater Permit by Rule Submissions ▼	30. Stormwater Application Submissions ▼				
<input type="checkbox"/> This form (including signature page) <input type="checkbox"/> Fee <input type="checkbox"/> Topographic Map <input type="checkbox"/> Plan or Drawing <input type="checkbox"/> Photos of Area	<input checked="" type="checkbox"/> This form (including signature page) <input type="checkbox"/> Fee <input checked="" type="checkbox"/> Proof of title, right or interest <input type="checkbox"/> Certificate of good standing (if applicable) <input type="checkbox"/> Photos of Area <input type="checkbox"/> Copy of Public Notice	<input type="checkbox"/> Professional & Notice Certification <input type="checkbox"/> Basic standards submissions <input type="checkbox"/> General standards submissions <input type="checkbox"/> Flooding standard submissions <input type="checkbox"/> Other standard submissions <input type="checkbox"/> Compensation Fee (if required)			
31. FEES, Amount Enclosed:					
Does the agent have an interest in the project? If yes, what is the interest?: <input type="checkbox"/> Yes → <input checked="" type="checkbox"/> No					

**IMPORTANT: IF THE SIGNATURE BELOW IS NOT THE APPLICANT'S SIGNATURE, ATTACH LETTER OF AGENT AUTHORIZATION SIGNED BY THE APPLICANT.**

By signing below the applicant (or authorized agent), certifies that he or she has read and understood the following:

**CERTIFICATIONS / SIGNATURES**

<p>"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein.</p> <p>Further, I hereby authorize the DEP to send me an electronically signed decision on the license I am applying for with this application by e-mailing the decision to the electronic address located on the front page of this application (see #4 for the applicant and #9 for the agent.)"</p>	
Signed:	 Title <u>SVP Business Development, Palmer Management Corp. Manager of Building LLC</u> Date: <u>May 10 2018</u>
Notice of Intent to Comply with Maine Construction General Permit	<p>With this Stormwater Law application form and my signature below, I am filing notice of my intent to carry out work which meets the requirements of the Maine Construction General Permit (MCGP). I have read and will comply with all of the MCGP standards.</p> <p>Signed  Date: <u>May 10 2018</u></p>

**NOTE: If a Notice of Intent is required, you must file a Notice of Termination (attached as Form G) within 20 days of completing permanent stabilization of the project site.**

**ADDITIONAL SIGNATURES / CERTIFICATIONS**

The person responsible for preparing this application and/or attaching pertinent site and design information hereto, by signing below, certifies that the application for stormwater approval is complete and accurate to the best of his/her knowledge.

Signature: 

Name (print): Stephen Bushey, PE

Date: May 9, 2018

Re/Cert/Lic No.: \_\_\_\_\_

Engineer 7429

Geologist \_\_\_\_\_

Soil Scientist \_\_\_\_\_

Land Surveyor \_\_\_\_\_

Site Evaluator \_\_\_\_\_

Active Member of the Maine Bar \_\_\_\_\_

Professional Landscape Architect \_\_\_\_\_

*2/10/10*

*[Handwritten signature]*

## SUBMITTAL CHECKLIST

### **Submissions for all stormwater projects, as applicable, except stormwater PBR:**

- Completed application form with signatures
- Fee worksheet & fee
- Professional & notice certification
- Notice of intent to file
- Proof of title, right, or interest
- Certificate of Good Standing (corporations only)
- Photos of the project site

### **Basic standards submissions:**

- Erosion and sedimentation control plan
  - Location plan
  - Site details
- Inspection and maintenance plan
  - List of measures
  - Inspection & maintenance tasks
  - Task frequency
  - Responsible parties
  - Maintenance plans
- Housekeeping plan

### **General standards submissions:**

- Narrative
- Drainage plans
- Calculations
  - Water volume
  - Buffer sizing
- Details, designs, and specifications
  - Ponds
  - Underdrained vegetated filters
  - Infiltration systems
  - Buffers
- Phosphorus export calculations
- Maintenance contract

### **Flooding standard submissions:**

- Control of peak flows
- Details, designs, and specifications

# QUITCLAIM DEED WITH COVENANT

**Bayroot LLC**, a Delaware limited liability company, with a place of business in Lyme, New Hampshire, for consideration paid, grants to **Linkletter Timberlands, LLC**, a Maine limited liability company with a mailing address of P.O. Box 135, Athens, Maine 04912, with quitclaim covenant, a certain lot or parcel of land, together with any improvements thereon, in **Mexico, Roxbury, and Rumford, Oxford County, Maine**, more particularly described in Exhibit A attached hereto.

In witness whereof, Bayroot LLC has caused the foregoing instrument to be signed and sealed by its duly authorized manager this 6<sup>th</sup> day of Dec., 2004.

Witness:

**BAYROOT LLC**  
**By Wagner Forest Management, Ltd.,**  
**its Manager**

*Richard J. Chandler*

By *Thomas J. Colgan*  
Thomas J. Colgan, President

**MAINE REAL ESTATE  
TRANSFER TAX PAID**

STATE OF NEW HAMPSHIRE

Grafton County

December 6, 2004

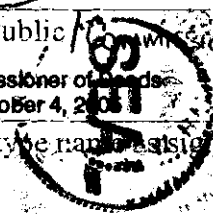
Personally appeared the above named Thomas J. Colgan, President of Wagner Forest Management, Ltd., and acknowledged before me the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said Wagner Forest Management, Ltd. in its capacity as Manager and the free act and deed of Bayroot LLC.

*Carolyn C. Demers*

Notary Public / *Commissioner of Deeds*

CAROLYN C. DEMERS, Commissioner of Deeds  
My Commission Expires October 4, 2005

Print or type name as signed



**EXHIBIT A**

Certain lots or parcels of land situate in Mexico, Roxbury and Rumford, Oxford County, Maine, more particularly bounded and described as follows:

**MEXICO**

FIRST PARCEL: Certain lots or parcels of land in said Mexico being more particularly bounded and described in the deeds to Oxford Paper Company from Frank H. Lovejoy et al dated September 14, 1926 and recorded in Book 378, Page 582 of the Oxford County Registry of Deeds; and from Sila Grace Reed dated February 27, 1929 and recorded in Book 392, Page 142, subject to the easements, reservations and exceptions set forth in said deeds, the descriptions therein being incorporated by reference.

There is also hereby conveyed that certain right of way described in the deed from Lester Bradeen et al to Oxford Paper Company dated June 29, 1927 and recorded in Book 385, Page 50.

Excepting and reserving therefrom the property described in the deed from Oxford Paper Company to Howard P. Waldenmyer dated August 24, 1960 and recorded in Book 591, Page 567, subject to the easements, reservations and exceptions set forth in said deeds, the descriptions therein being incorporated by reference, but specifically conveying the right of way reserved by the grantor therein.

SECOND PARCEL: Certain lots or parcels of land in said Mexico being more particularly bounded and described in the deed from Thomas L. Dickson Sr., et al to Ethyl Corporation dated October 16, 1967 and recorded in Book 492, Page 535 of the Oxford County Registry of Deeds, as follows: "...being a strip of land off the North end of lot numbered Eighteen (18) in Range Six (6) in said Town of Mexico, ...bounded as follows: On the North by land now or formerly of Edwin Barrett and George Flagg; on the East by land now or formerly of Ernest Weeks; on the South by land now or formerly of Moses Storer and on the West by land now or formerly of Eugene Goff ....Also ...the former homestead farm of Edmond Barrett, otherwise known as Edwin Barrett, Poplar Hill Road, Lot #18, Range #8, ...and the westerly half of Lot #18, Range

#7.” Subject to the easements, reservations and exceptions set forth in said deed, the descriptions therein being incorporated by reference.

Also conveying a certain lot or parcel of land in said Mexico being more particularly bounded and described in the deed from James A. Blaisdell to Oxford Paper Company dated October 1, 1977 and recorded in Book 964, Page 94, together with all appurtenant rights of way and easements described therein, and subject to the easements, reservations and exceptions set forth in said deed, the descriptions therein being incorporated by reference.

The above described property is subject to, and excepting and reserving therefrom, those rights and easements more particularly bounded and described in the Notice of Layout and Taking by the State of Maine dated February 10, 1987 and recorded in Book 1460, Page 264.

Excepting and reserving therefrom the property described in the deed from Oxford Paper Company to Clarence D. Smith et al dated November 16, 1991 and recorded in Book 1849, Page 34, the descriptions therein being incorporated by reference.

There is also hereby conveyed those rights acquired by Oxford Paper Company by Deed of Easement from Barry R. Faucon dated July 12, 1990 and recorded in Book 1745, Page 214, the descriptions therein being incorporated by reference.

THIRD PARCEL: Two certain lots or parcels of land in said Mexico being more particularly bounded and described in the deed from Bert G. Doyen to Oxford Paper Company dated October 16, 1920 and recorded in Book 348, Page 307 of the Oxford County Registry of Deeds, as follows: “the northerly half of lot numbered Eleven (11) in Range Six (6)... and ...a parcel ...off the south half of lot numbered eleven (11) in the sixth (6) range of lots in said Mexico, said parcel being from the northwest corner of said south half of said lot eleven (11), and running forty-eight (48) rods on the north end of said south half of said lot eleven (11) and twenty (20) rods on the west line of said lot...”, together with that certain right of way “deeded by said Lane ... across said lot eleven (11) and across lot numbered twelve (12) in said sixth range of lots”, as it affects the property herein conveyed and as described in said deed recorded at Book 348, Page

307, subject to the easements, reservations and exceptions set forth in said deed, the descriptions therein being incorporated by reference.

The above described property is conveyed with the benefit of the Deed of Easement from New River-Franklin, Ltd. to Mead Oxford Corporation dated June 30, 1999 and recorded in Book 2720, Page 77, as it affects the property herein conveyed.

FOURTH PARCEL: A certain lot or parcel of land in said Mexico being more particularly bounded and described in the deed from Delia Bernard to Oxford Paper Company dated February 28, 1967 and recorded in Book 659, Page 122 of the Oxford County Registry of Deeds, as follows: "the Southwest part of lot eight (8) in Range four (4)", subject to the easements, reservations and exceptions set forth in said deed, the descriptions therein being incorporated by reference.

The above described property is conveyed with the benefit of the Deed of Easement from New River-Franklin, Ltd. to Mead Oxford Corporation dated June 30, 1999 and recorded in Book 2720, Page 77, as it affects the property herein conveyed.

The above described property is subject to the Deed of Easement from Mead Oxford Corporation to New River-Franklin, Ltd. dated June 30, 1999 and recorded in Book 2720, Page 42, as it affects the property herein conveyed.

### **ROXBURY**

FIRST PARCEL: A certain lot or parcel of land in said Roxbury being more particularly bounded and described in the deed from Malcolm A. McInnes to Oxford Paper Company dated May 22, 1930 and recorded in Book 399, Page 378 of the Oxford County Registry of Deeds.

The above parcel is conveyed subject to that easement given by Oxford Paper Company to Central Maine Power Company dated November 2, 1961, recorded in Book 609, Page 87, as amended by instrument dated July 5, 2000, recorded in Book 2841, Page 60, but there is hereby conveyed any rights reserved by Oxford Paper Company therein.



SECOND PARCEL: Certain lots or parcels of land in said Roxbury being more particularly bounded and described in the deeds from M.E. Hussey to Oxford Paper Company dated October 22, 1920 and recorded in Book 354, Page 465; and from Frank H. Lovejoy to Oxford Paper Company dated January 4, 1924 and recorded in Book 369, Page 69, subject to the easements, reservations and exceptions set forth in said deeds, the descriptions therein being incorporated by reference.

Also conveying certain lots or parcels of land in said Roxbury bounded and described in the deed from Swain & Reed, Inc. to Oxford Paper Company dated December 12, 1955 and recorded in Book 559, Page 2 as follows: "...being all of Lot numbered One (1) in the Fifth (5<sup>th</sup>) Range of Lots and Lot numbered two (2) in the Fifth (5<sup>th</sup>) Range of Lots in said Roxbury, commonly known as the S.M. Locke premises or homestead", subject to the easements, reservations and exceptions set forth in said deed, the description therein being incorporated by reference.

Also, certain lots or parcels of land in said Roxbury being more particularly bounded and described in the deed from Charles P. Bartlett to Oxford Paper Company dated May 18, 1966 and recorded in Book 645, Page 421, subject to the easements, reservations and exceptions set forth in said deed, the descriptions therein being incorporated by reference.

THIRD PARCEL: Certain lots or parcels of land in said Roxbury being more particularly bounded and described in the deeds to Oxford Paper Company from Frank H. Lovejoy et al dated September 14, 1926 and recorded in Book 378, Page 582; and from Sila Grace Reed dated February 27, 1929 and recorded in Book 392, Page 142, subject to the easements, reservations and exceptions set forth in said deeds, the descriptions therein being incorporated by reference.

Excepting and reserving therefrom the property described in the deed from Oxford Paper Company to Howard P. Waldenmyer dated August 24, 1960 and recorded in Book 591, Page 567, subject to the easements, reservations and exceptions set forth in said deeds, the descriptions therein being incorporated by reference, but specifically conveying the right of way reserved by the grantor therein.

**RUMFORD**

FIRST PARCEL: A certain lot or parcel of land in said Rumford being more particularly bounded and described in the deed from Charles P. Bartlett et al to Oxford Paper Company dated September 27, 1966 and recorded in Book 645, Page 593 of the Oxford County Registry of Deeds as: Lot number eighty-seven (87) in the Third Division of Lots according to the plan of the Town of Rumford, subject to the easements, reservations and exceptions set forth in said deed, the descriptions therein being incorporated by reference.

The above described property is conveyed with the benefit of that Deed of Easement given to Oxford Paper Company by Wendall Broomhall et al dated August 21, 1991 and recorded in Book 1828, Page 291, as it affects the property herein conveyed.

SECOND PARCEL: Certain lots or parcels of land in said Rumford being more particularly bounded and described in the deed from Arthur A. Breau to Ethyl Corporation dated December 11, 1970 and recorded in Book 695, Page 562 of the Oxford County Registry of Deeds, together with all appurtenant rights of way and easements described therein, and subject to the easements, reservations and exceptions set forth in said deed, the descriptions therein being incorporated by reference, and as further affected by the Easement Release given by Oxford Paper Company to Edward L. Carey, Jr. dated September 10, 1993 and recorded in Book 2050, Page 1.

For Grantor's source of title to the property conveyed herein, further reference may be had to the deed from MeadWestvaco Oxford Corporation to Bayroot LLC dated November 21, 2003 and recorded in Book 3428, Page 28 of said Registry.

Received  
Recorded Register of Deeds  
Dec 13, 2004 12:34:17P  
Oxford East County  
Jane Rich

**MEMORANDUM**  
*of*  
**ASSIGNMENT of LEASE**

THIS MEMORANDUM OF ASSIGNMENT OF LEASE is executed for the purposes of recording in the Oxford County Registry of Deeds and affects a Lease dated September 5, 2012 and Addendum to Lease dated February 16, 2015, between **LINKLETTER TIMBERLANDS, LLC** (“LESSOR”) and **MAINE DISTRIBUTED POWER, LLC** (“LESSEE”), on certain property located on Horseshoe Valley Road, in the Town of Roxbury, County of Oxford and State of Maine, and as further referenced in a Memorandum of Lease recorded in the Oxford County Registry of Deeds at Book 5219, Page 54, and as described in the attached Exhibit A.


By Assignment and Assumption Agreement dated February 18, 2016, **MAINE DISTRIBUTED POWER, LLC** assigned all its right, title and interest under said Lease to **HORSESHOE VALLEY WIND LLC**, a Maine limited liability company.

By Agreement dated March 16, 2017, **HORSESHOE VALLEY WIND LLC** assigned all its right, title and interest under said Lease to **ROX WIND LLC**, a Massachusetts limited liability company with its principal place of business in Cohasset, Massachusetts.

The above Memorandum is executed for the purposes of recording only and is not meant to alter or amend the Lease between the parties.

IN WITNESS WHEREOF, this Memorandum of Lease has been executed this 11 day of January, 2018.


WITNESS:

Maine Distributed Power, LLC,  
By: Horseshoe Valley Wind LLC, Manager

By:   
John Richardson, Manager

Horseshoe Valley Wind LLC

By:   
John Richardson, Manager

Rox Wind LLC  
By: Palmer Management Corporation

By:   
Gordon Deane, President



State of Maine  
Sagadahoc, ss.

January 11, 2018

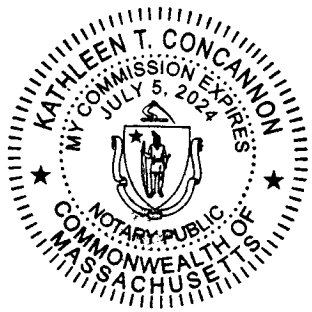
Personally appeared the above named John Richardson, Manager of Horseshoe Valley Wind, LLC and acknowledged the foregoing instrument to be his free act and deed in his said capacity.

Before me,  
  
~~Attorney at Law~~ Notary Public **Betty R. Zolla**  
My Commission Expires **October 5, 2018**

State of Massachusetts  
NORFOLK, ss.

January 16, 2018

Personally appeared the above named Gordon Deane, President of Palmer Management Corporation, and acknowledged the foregoing instrument to be his free act and deed in his said capacity.



Before me,  
  
~~Attorney at Law~~ Notary Public

# **STORMWATER MANAGEMENT REPORT**

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**STORMWATER MANAGEMENT  
NARRATIVE  
(Framework taken from Section  
12 of SLODA Application)**

**ROXBURY WIND PROJECT**

**Submitted to:**

Maine Department of  
Environmental Protection  
17 State House Station  
Augusta, ME 04333

**Submitted by:**

RoxWind LLC

**Prepared by:**

Stantec Consulting Services Inc.  
482 Payne Road  
Scarborough, ME 04074

May 9, 2018

**STORMWATER MANAGEMENT NARRATIVE  
(FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

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**STORMWATER MANAGEMENT NARRATIVE  
(FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

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## **STORMWATER MANAGEMENT NARRATIVE (FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

Wind Power Project Summary

May 9, 2018

### **12.1 Wind Power Project Summary**

RoxWind LLC (Applicant) is proposing a small-scale wind energy project in the Town of Roxbury, Maine; the Roxbury Wind Project (project). The project consists of 4 wind turbine generators, underground and overhead collection lines, and approximately 1.7 miles of access and crane roads. The project area consists of roads and turbine sites on the North Twin Mountain ridge just south of Route 120 in Roxbury. The site will be accessed from Horseshoe Valley Road. The project area is identified within the D-5 area of Map 18 of the DeLorme Gazetteer. The project site is under single ownership and is identified as Lots 34 and 35 on Roxbury Township Tax Map 02.

The project area consists of undeveloped forestland that has been heavily logged within the past 15 years. An existing logging road traverses the west side of the hill and logging equipment trails are located throughout most of the top of the ridge and along the hillside. Approximately 6.3 acres of impervious area in the form of roads and turbine pads will be created during construction, which is expected to be performed within a one-year time frame or less. Following construction, approximately 3.5 acres of the constructed impervious area will be permanently revegetated. Approximately 2.8 acres will remain as impervious area and will consist of approximately 9,000 LF of 12-foot wide gravel maintenance road and remaining crane pads at each of the 4 turbine sites. The overall project footprint related to the roads and pad areas will amount to approximately 16.9 acres. The transmission line corridor will "occupy" another 0-1.5 acres. The total project area is estimated to be approximately 16.9-18.4 acres.

The following narrative describes and quantifies pre- and post-development stormwater characteristics of the project area. The accompanying discussion demonstrates that construction of the project will comply with the applicable Maine Department of Environmental (MaineDEP) Stormwater Management Requirements in Chapter 500. The stormwater management measures for this development have been designed to meet the applicable Basic Standards and General Standards, of Chapter 500. The project involves less than 3 acres of permanent impervious area and will not qualify for a Site Law Permit, thus, in accordance with Chapter 500, Part 4.F(1), the flooding standard does not apply to the project. However, the following narrative does contain a brief discussion about the insignificant impacts to runoff conditions resulting from the project activity.

### **12.2 Surface Water on or Abutting the Site**

The development activities are located along the North Twin ridge top and hillside within Roxbury Township. The west side of the hill drains to Meadow Brook and ultimately the Ellis River, which flows to the Androscoggin River. The east side of the hill drains to the Swift River and ultimately the Androscoggin River. There are no known watershed resources of concern or impaired within the immediate downstream area of the site.

## **STORMWATER MANAGEMENT NARRATIVE (FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

Downstream Ponds and Lakes

May 9, 2018

### **12.3 Downstream Ponds and Lakes**

The project is not within a lake or pond watershed.

### **12.4 General Topography**

The topography of the land surface within the project area is mountainous terrain, as is common within this portion of the state. Along the ridge top, slopes range from approximately 5 to 25 percent. Elevations across the area range from approximately 1,200 feet above mean sea level at the base of the hill to 2,150 feet above mean sea level along the ridgeline. Two-foot aerial contour mapping has been used for the basis of design and analysis. Various existing drainage flow paths including intermittent streams have been identified within the project limits, as part of soils data collection and natural resources data collection.

### **12.5 Flooding**

Stantec has reviewed the 100-year flood zone mapping for Roxbury Township, and find that no portion of the proposed project lies within any mapped floodplain.

### **12.6 Alterations to Natural Drainage Ways**

In the post-development condition, the existing drainage patterns will be maintained to the extent practicable by implementing stormwater management practices that mimic existing hydrology. The proposed access and ridgeline crane roads will be constructed to a width of 24 feet and 34 feet respectively during the construction period. Following construction, these roads will be permanently restored to a narrow width of 12 feet to provide a maintenance road access. The remaining construction road sections will be restored to a permanently vegetated cover condition using a combination of salvaged organic material including loam and erosion control mix that will be reseeded. The roads will also be restored to provide a shallow treatment swale running the length of the roads. The treatment swale is proposed as the primary method for water quality treatment. Forested buffers<sup>1</sup> were considered, however, because the buffers must be included in the calculation of the "occupied" project area, it was determined that an alternative form of treatment Best Management Practice (BMP), to be located within the road area, is necessary to reduce the overall project area below the 20-acre threshold value. To keep the natural hillside drainage patterns intact to the extent practicable, the stormwater management design will also consist of incorporating numerous culverts, ditch turnouts, level spreaders, and plunge pools spaced where appropriate along the access and crane roads to collect runoff and then discharge it as sheet flow as much as practicable or to otherwise maintain current

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<sup>1</sup> See Maine Department of Environmental Protection Volume III BMP Technical Design Manual- Chapter 5

## STORMWATER MANAGEMENT NARRATIVE (FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)

Alterations to Land Cover Within the Watershed

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hydrologic conditions. The project construction may also include the use of rock sandwich road sections that will effectively allow shallow subsurface flow to pass horizontally through roadway material to maintain the natural hydrologic conditions. The use of the rock sandwich section is likely to be limited, however, based on the small amount of wetland crossings or related hydrologic conditions. There are several intermittent streams identified within the project limits. At the base of the hillside, the proposed road alignment has been positioned to maintain an existing ditch side watercourse, a portion of which passes over/thru a remnant log yard at the beginning of the access road. A new ditch line will be constructed around this landing area and the watercourse will be routed down to the existing road side ditch along Horseshoe Valley Road. This drainage will flow a short distance within the existing roadside ditch to an existing 18" culvert under the road. The tributary flow path then generally flows westerly through an uncut forested area. Another tributary, located at approximately Station 126+00 on the proposed hillside access road, will be culverted with a 48" RCP Class III pipe that will be embedded to provide a natural substrate bottom over the lower half of the pipe.

### 12.7 Alterations to Land Cover Within the Watershed

Following construction, approximately 3.5 acres of the 6.3 acres of impervious area temporarily created for gravel construction surfaces will be restored to permanent vegetative cover, resulting in approximately 2.8 acres of new, permanent impervious areas (12-foot wide gravel roads, wind turbine foundations, and crane pads). The permanent restoration will involve a limited placement of organic material and seeding with appropriate vegetation restoration mix. Similar restoration efforts have been highly successful at other wind farms in the state.



The following is a description of each development activity proposed:

1. Wind Turbine Pads: Each wind turbine pad will be constructed within cleared site limits of approximately 1 to 2 acres. The pad sites will contain a 25-foot diameter concrete turbine foundation pedestal with a 16-foot wide gravel ring surrounding the pedestal, a 75-foot by 35-foot permanent gravel crane pad, and 12-foot access path into the pad area off the wind farm access road. Most of the construction area will be restored with erosion control mix and seeding with only the foundation pedestal, gravel ring, gravel crane pad, and access drives remaining as impervious area.
2. Access and Crane Roads: The project will include approximately 1.7 miles of access road (generally following an existing 10-foot-wide logging road at least from the base of

## STORMWATER MANAGEMENT NARRATIVE (FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)

Modeling Assumptions

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the hill to the beginning of the ridgeline) and new ridgeline crane road. During construction, the hillside access road will be constructed to a 24-foot wide gravel surface for the passage of turbine equipment delivery vehicles and construction traffic. The crane road will be located along the ridge top and will be constructed as a 34-foot wide temporary gravel surface, excepting for two short lengths of road that will be constructed at a temporary 40-foot-wide to allow for crane assembly. The roads will be revegetated to a permanent width of 12 feet post construction. The restoration of the crane road is expected to include a minimum 10-foot-wide to 28-foot wide vegetative restoration strip and treatment section or swale on the downhill side of the permanent road, within the original 24, 34, or 40-foot-wide area. In other words, the permanent road section includes a 2-foot wide vegetated shoulder on the uphill side, 12-foot wide gravel maintenance road, and 20 to 28-foot wide vegetated level buffer edge and treatment swale on the downhill side.



### 12.8 Modeling Assumptions

Our experience on previously permitted and constructed wind farms is that MaineDEP has agreed that stormwater runoff modeling to determine pre- and post-development peak flows under the flooding standards is not strictly required for wind farm projects that do not contain an Operations and Maintenance (O&M) building site, dynamic reactive device (DRD), and substation area(s); as is the case with this project. Further, Chapter 500, Part 4.F(1) also stipulates that projects with less than 3 acres of impervious area and not subject to Site Law, are not subject to the Flooding standards. A brief pre- and post-development curve number (CN) comparison analysis is provided as evidence that the project will have an insignificant impact on the peak stormwater flows in the watershed. For this project, the overall change to CN for the watersheds is based on soils and vegetative cover.

Generally, the site soils are predominantly Hydrologic Soils Group (HSG) D soils, with limited HSG B and C soils. The ridgeline contains predominantly D soils and the lower sections of the hillside contain B and C soils.<sup>2</sup> The introduction of a small area of impervious area within the broader watershed will result in an insignificant impact to the overall CN coefficient for the watersheds. Thus, there is expected to be no measurable impact to peak discharge attributable to the project. This finding is consistent with other wind farm proposals previously reviewed and approved by MaineDEP.

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<sup>2</sup> See Class L soils survey results from Stantec.

## **STORMWATER MANAGEMENT NARRATIVE (FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

Maps

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### **12.9 Maps**

Mapping used for this stormwater analysis is summarized below:

- Watershed worksheets on file with the Stantec engineer.
- Soils mapping obtained from the Natural Resources Conservation Service (NRCS) Soil Survey of Oxford County, Maine.
- Soils mapping developed from the Class L Soil Survey completed by Stantec for the areas affected by project construction.

### **12.10 Drainage Plans**

Stantec has prepared the preliminary road and crane pad plans and details for the proposed development area. The progress plans currently include existing and proposed topography and clearing limits. Additional information including general cover types, soil groups, watershed boundaries, existing features, primary drainage ways, locations of proposed turbine pads and new roads are also identified on the plans.

### **12.11 Runoff Analysis**

A specific pre- and post-development analysis of peak flows has not been performed due to the overall project area size and since the flooding standard is not applicable to the project; a CN comparison analysis supports the finding that there will be no significant impact to runoff peak flows resulting from the project. The analysis includes a brief computation for determining the increase of runoff CN values for the pre- and post-development project watersheds. A runoff CN of 55 to 77 can be used for the predevelopment watershed based on HSG B soils and HSG D soils for a Woods condition<sup>3</sup>. The purpose of the CN analysis is to show that the proposed project activities result in an insignificant impact to the overall watershed CN. A watershed CN is an indicator for predicting direct runoff or infiltration from rainfall excess. A significant change (increase) in the CN might indicate an increase in stormwater runoff conditions. An insignificant change in the CN indicates there will be no impact to overall stormwater runoff conditions. A summary of the pre- and post-development CN values is provided in the following Section.

### **12.12 Peak Runoff Computations**

#### Curve Number Computation for Linear Portions of Project

The soils and HSGs within the project area are based on the Class L Soil Survey completed by Stantec. Soils are generally HSG B, C, and D within the study area. For assessing the

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<sup>3</sup> See USDA Technical Release 55 (TR-55) Chapter 2 Table 2-2c

## **STORMWATER MANAGEMENT NARRATIVE (FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

Variance Submissions

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overall CN of the watershed, the engineer assumed a study area that extends 750 feet to each side of the project limits. This amounts to an area exceeding 300 acres. Based on the approximate watershed area an average predevelopment CN value of approximately 70. In the post-development condition, the minor increase of 2.8 acres of gravel surface with CN of 88 (avg.) results in an insignificant impact to the overall CN for the 300-acre area.

The weighted CN for the post development watershed changes insignificantly (< 0.5%) from the pre-developed condition to the post-developed condition since there is an insignificant change to the overall impervious cover types, i.e.: 2.8 acres is less than 1% of the total study area for this analysis. On this basis, we can conclude that the impact due to the creation of the impervious areas by this development and its small change in land cover in relation to the overall size of the watersheds is negligible. This finding is consistent with many other larger wind projects, which have contained far more road or turbine pads and less permanent vegetative restoration.

### **12.13 Variance Submissions**

A variance from the peak flow standard is not necessary as the project is not subject to the Flooding standards in accordance with Chapter 500.4.F (1). As stated previously, due to the small amount of impervious area created relative to watershed size, the CN analysis has demonstrated that there will be no significant impact to post-development runoff conditions. As a result, the project will not adversely affect downstream conveyance conditions or properties.

### **12.14 Sizing of Culverts**

All culvert sizing and placement has been based on the MaineDEP Chapter 500.5.A Standards. These standards require that all projects discharging runoff in the form of concentrated flow must convert the runoff to sheet flow before leaving the project limits unless within an existing concentrated flow pattern or conveyance channel. To achieve this objective, flared ends and rip rap outlet aprons and level spreaders are detailed on the plans at locations where sheet flow dispersal is desired. The calculations for sizing the proposed culverts are contained as an Attachment to this report. Detailed drawings for the proposed on-site conveyance structures, including drainage swales, culverts with inlet and outlet protection details, and ditch turnouts, are shown on the Plan and Profile Drawings and Construction and Erosion Control Detail drawings in the Permit Plan Set. Stabilization methods will be designed, constructed, and maintained in accordance with the project's Erosion and Sedimentation Control Plan (E&S Plan), which is consistent with the *Maine Erosion and Sedimentation Control Best Management Practices*.

Please refer to the erosion control notes sheet for a detailed description of the site-specific erosion control measures and practices to be utilized during construction of the access road, crane road, pads, and collector system.

## **STORMWATER MANAGEMENT NARRATIVE (FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

Stormwater Treatment

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### **12.15 Stormwater Treatment**

Generally, water quality treatment will be provided by vegetated grassed filter swales and permanent restoration of a vegetated edge along the length of the access and crane roads. The restored vegetated edge will extend 10 feet on the access road and 20 feet on the crane road. Runoff generated by the remaining 12-foot-wide maintenance road will sheet across the revegetated strip and pass across the treatment swale. The treatment swale will contain an 18-inch-deep filter media layer, as is customary for a filtering BMP. This treatment approach varies from the traditional use of undisturbed roadside buffers, ditch turnout buffers and level lip spreader buffers as it is necessary to limit the overall project area to less than 20 acres. The runoff passing through the filter media will continue to pass through the underlying road gravels for absorption into the underlying soils or will daylight out fill embankments onto native soils areas. During heavier rainfall events the road runoff will sheet across the restored surfaces and down embankments simply as overflow runoff. Typical wind farm road construction consists substantially of processed aggregated materials sourced onsite. Anecdotal evidence from other wind farm projects indicates that the roads are substantially porous and provide pervious surface conditions for the most part. Nevertheless, the proposed Roxwind activity will include the placement of a treatment swale containing a filtering soil layer to address the project's water quality treatment objectives.



### **12.16 Infiltration System**

No formal infiltration systems are proposed. Because the proposed roads will be constructed largely from blasted rock fill, the design does not incorporate any underdrain pipe installation beneath the vegetated treatment swales. The absorption of runoff in the swales will result largely in water passing through the filter media, into the subbase conditions, where water is expected then to move laterally out through the blasted rock fill road section, with breakout at the toe of slope or into the roadside ditches for conveyance to culverts, turnouts, level spreaders, and plunge pools. Some of this water may ultimately be reabsorbed into the underlying soils as well.

### **12.17 Drainage Easement Declarations**

No formal drainage easements are required as the use of buffers for water quality treatment is not proposed.

## **STORMWATER MANAGEMENT NARRATIVE (FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

Stormwater Quality Treatment Plan

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### **12.18 Stormwater Quality Treatment Plan**

The project lies within watersheds that directly contribute to river segments. Water quality has been evaluated for Basic Standards and General Standards.

#### A. Basic Standards Submissions

In accordance with the Basic Standards, stormwater conveyance structures will be designed, constructed, and stabilized using Erosion and Sedimentation (E&S) BMPs. The stormwater conveyance structures will be maintained to prevent or correct any noted erosion problems to ensure their continued effectiveness. The Applicant's E&S Plan outlines the measures that will be utilized to prevent erosion from occurring, and to address any problems that may develop. The E&S Plan incorporates the applicable methods and materials presented in the *Maine Erosion and Sediment Control BMPs*, dated March 2003. The E&S Plan contains the details and specifications for general stabilization of the site. These measures will be used to protect exposed soils during construction and during the service life of the project. The primary erosion control measure to be used during construction will be the use of locally sourced processed blast rock fill material or Erosion Control Mix<sup>4</sup> that will be placed over much of the project's disturbed surfaces. The use of Erosion Control Mix has been found to be most effective for the type of soil disturbance activity proposed. The contract documents will include requirements that processed ledge material for road building be available for immediate placement at the onset of major road clearing and construction activity, thus minimizing the time period of denuded or exposed ground surfaces to erosion.

The stabilization measures for the site will include temporary and permanent E&S controls; appropriate design of swales, culverts, and erosion protection for earthen cut and fill slopes; and provisions for future maintenance of the site.

#### B. General Standards Submission

The proposed development will have more than 1 acre of impervious area and will have more than 5 acres of developed area so compliance with the General Standards is required at a minimum. The development activity generally consists of roads that are considered linear. The standards for linear projects require that at least 75 percent of the impervious area within the project be treated. To achieve the water quality treatment goal, the project will employ a strategy including the restoration of a vegetated edge along the access and crane roads. This vegetated edge will also contain a linear treatment swale with filter media bottom. The intent is for runoff from the 12-foot wide maintenance road to sheet across the vegetated surface and to be allowed an opportunity to absorb down

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<sup>4</sup> See Maine Department of Environmental Protection – Information Sheet: Erosion Control Mix for Mulch – [www.maine.gov/dep/blwq/docstand/stormwater/is-ecmixmulch.htm](http://www.maine.gov/dep/blwq/docstand/stormwater/is-ecmixmulch.htm)



## **STORMWATER MANAGEMENT NARRATIVE (FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

Off-Site Credits

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through a filtering soil media layer in the treatment swale. The 4 turbine pads will also contain vegetative surface restoration where any runoff emanating from the remaining pad, turbine foundation and access road will sheet across a restored meadow condition covering the pad site.

### **12.19 Off-Site Credits**

Off-site credits for total suspended solids (TSS) or phosphorous are not proposed for the project.

### **12.20 Runoff Treatment Measures**

The drainage design for this project will consist of revegetated roadside edges promoting sheet flow, vegetated treatment swales, vegetated and stone-lined conveyance swales, culverts, ditch turnouts, level spreaders, and plunge pools. Vegetated and stone-lined swales within the road sections will collect and direct runoff from a portion of the access road, crane road, turbine pads.

### **12.21 Control Plan for Thermal Impacts to Coldwater Fisheries**

The development activities will not result in thermal impact to downstream conditions based on the insignificant impact to overall runoff conditions in the watersheds. The use of level spreaders and turnouts to disperse concentrated flow into wooded areas will also prevent thermal impacts. The use of processed rock aggregate for road base construction also provides substantial rainfall absorption and minimizes stormwater runoff conditions.

### **12.22 Control Plan for Other Pollutants**

A control plan for other pollutants in stormwater runoff is not required.

### **12.23 Engineering Inspection of Stormwater Management Facilities**

The Applicant will ensure that a professional engineer or qualified representative inspects the construction site periodically to verify that the stormwater culverts, conveyance and treatment swales, level spreaders, and plunge pools, are constructed in accordance with the plans and specifications shown on the permit plan set, and that these structures are functioning properly. These inspections will commence with the initial earth moving activities on the site and will continue, as needed, during any period when construction activity affecting the stormwater management system occurs, until the site is permanently stabilized.

## STORMWATER MANAGEMENT NARRATIVE (FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)

Components of the Roxbury Wind Project Post-Construction Stormwater Maintenance Plan

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### 12.24 Components of the Roxbury Wind Project Post-Construction Stormwater Maintenance Plan

The project will be solely-owned, operated, and maintained by RoxWind LLC.

- A. Stormwater Management Measures to be Inspected and Maintained: The stormwater management facilities to be maintained at the project site may include:
- Vegetated roadside edges;
  - Vegetated stormwater conveyance and treatment swales;
  - Ditch turn-outs, level spreaders, and plunge pools;
  - Culverts with inlet/outlet protection;
  - Permanent maintenance road; and
  - Revegetated areas and embankments.
- B. General Inspection and Maintenance Requirements: Generally, the proposed facility will be operated and maintained in a manner consistent with good utility practices, including routine visual inspections (during growing seasons and after heavy rain events as outlined in Ch. 500 Appendix B.2 or as directed below) and routine maintenance of stormwater management structures as needed.

Visual inspection and maintenance requirements for these facilities are identified below.

1. Vegetated Stormwater Conveyance and Treatment Swales: Visually inspect for any signs of existing or developing blockage of flow, trash, erosion, channeling or excessive build-up of sediment. Vegetated swales/ditches will be maintained to control the growth of woody vegetation within the channel, but no more than once per year. Rip rap swales/ditches will be visually inspected for signs of scour beneath rip rap or dislodging of any stones.
2. Ditch Turn-outs, Level Spreaders, and Plunge Pools: Visually inspect in the spring and late fall and following major storm events for the first year for signs of channelization. Repairs will be made immediately. After first year inspect annually or after heavy rainfall events for signs of channelization and debris/sand build-up. Debris will be removed as needed.
3. Culverts with Inlet/Outlet Protection: Visually inspect in the spring and late fall all culverts for signs of blockage or erosion at inlet and outlet. Remove any debris that is creating blockage as needed.
4. Permanent Maintenance Road: The roadway will typically require little on-going maintenance, due to the limited use of heavy vehicles although routine ATV and related traffic may result in erosive conditions. These areas will be visually inspected on a routine basis, and signs of existing or developing areas of channelized flow, erosion, rutting, trash, or unwanted vegetation will be removed/repared immediately as needed.
5. Revegetated Areas and Embankments: Revegetated areas and embankments will be inspected each spring. Any signs of erosion or inadequate revegetation of these areas will be corrected as needed. Reseed and mulch any areas with less than 90% cover.

# **APPENDICES**

**STORMWATER MANAGEMENT NARRATIVE  
(FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

Appendix A Post Construction Stormwater Inspection and Maintenance Log

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**Appendix A Post Construction Stormwater Inspection and  
Maintenance Log**

**STORMWATER MANAGEMENT NARRATIVE  
(FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

**Appendix A Post Construction Stormwater Inspection and Maintenance Log**

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Roxbury Wind Project			
Stormwater Management System Inspection & Maintenance Log			
	Schedule		
	Spring and Fall Inspection <sup>5</sup>	Maintenance	Inspector Initials and Date
			Inspector Comments
Revegetated Areas and Embankments:			
Inspect all revegetated areas and embankments	X		
Replant bare areas or areas with sparse growth		As Required	
Armor areas with rill erosion with an appropriate lining or divert the erosive flows to on-site		As Required	
Drainage Conveyance Systems:	X		
Inspect swales, level spreaders and plunge pools for evidence of erosion, debris, woody growth, and excessive sediment	X		

<sup>5</sup> Or after heavy rain events

**STORMWATER MANAGEMENT NARRATIVE  
(FRAMEWORK TAKEN FROM SECTION 12 OF SLODA APPLICATION)**

Appendix A Post Construction Stormwater Inspection and Maintenance Log

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Roxbury Wind Project			
Stormwater Management System Inspection & Maintenance Log			
	Schedule		Inspector Initials and Date
	Spring and Fall Inspection <sup>5</sup>	Maintenance	
Remove any obstructions and accumulated sediments or debris		As Required	Inspector Comments
Control vegetated growth and woody vegetation	X	As Required	
Repair any erosion of the swale lining	X	As Required	
Mow vegetated swales		Annually	
Remove woody vegetation growing through riprap		As Required	
Repair any slumping side slopes		As Required	
Replace riprap where underlying filter fabric is showing or where stones have dislodged		As Required	
Culverts:			



**Stantec**

**STORMWATER MANAGEMENT NARRATIVE  
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Appendix A Post Construction Stormwater Inspection and Maintenance Log

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Roxbury Wind Project			
Stormwater Management System Inspection & Maintenance Log			
	Schedule		Inspector Initials and Date
	Spring and Fall Inspection <sup>5</sup>	Maintenance	
Inspect culvert inlet, outlet, and structure	X		Inspector Comments
Remove accumulated sediment and debris at the inlet, at the outlet, and within the conduit		As Required	
Repair any erosion at the culvert's inlet and outlet		As Required	
Inspect access road surfaces and shoulders for erosion, false ditches, and excess accumulation of sand that could impede water flow	X		
Remove excess sand either manually or with a front-end loader		As Required	
Grade gravel roads and shoulders		As Required	
Water Quality Treatment systems:			

**STORMWATER MANAGEMENT NARRATIVE  
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Appendix A Post Construction Stormwater Inspection and Maintenance Log

May 9, 2018

Roxbury Wind Project				
Stormwater Management System Inspection & Maintenance Log				
	Schedule		Inspector Initials and Date	Inspector Comments
	Spring and Fall Inspection <sup>5</sup>	Maintenance		
Inspect treatment swales for evidence of erosion or concentrated flow	X			
Inspect and repair down slope of all spreaders for erosion	X	As Required		
Repair, reseed areas of erosion or damaged vegetation in the buffers		As Required		
Maintenance Needed and When:				



## Appendix B Stormwater Calculations

## Pipe Sizing Calculations - Roxbury Wind Project

Pipe ID	CULVERT 1		
<b>25-Year Peak Runoff Rate</b>	<b>0.24</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>0.24</b>	<b>cfs</b>	
Pipe Diameter	<b>18</b>	in	
Cross Sectional Area	1.77	sf	
Slope	0.0100	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	4.71	ft	
Hydraulic Radius	0.52	ft	
k/n	114.62		
Flow Velocity	5.96	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>10.53</b>	<b>cfs</b>	

Pipe ID	CULVERT 2		
<b>25-Year Peak Runoff Rate</b>	<b>0.66</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>0.66</b>	<b>cfs</b>	
Pipe Diameter	<b>12</b>	in	
Cross Sectional Area	0.79	sf	
Slope	0.0500	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	3.14	ft	
Hydraulic Radius	0.40	ft	
k/n	114.62		
Flow Velocity	10.17	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>7.99</b>	<b>cfs</b>	

Pipe ID	CULVERT 3		
<b>25-Year Peak Runoff Rate</b>	<b>0.94</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>0.94</b>	<b>cfs</b>	
Pipe Diameter	<b>12</b>	in	
Cross Sectional Area	0.79	sf	
Slope	0.0140	ft/ft	
Mannings 'n'	0.014		
Wetted Perimeter	3.14	ft	
Hydraulic Radius	0.40	ft	
k/n	106.43		
Flow Velocity	5.00	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>3.92</b>	<b>cfs</b>	

Pipe ID	Culvert 4		
<b>25-Year Peak Runoff Rate</b>	<b>32.17</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>32.17</b>	<b>cfs</b>	
Pipe Diameter	<b>24</b>	in	
Cross Sectional Area	3.14	sf	
Slope	0.0670	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	6.28	ft	
Hydraulic Radius	0.63	ft	
k/n	114.62		
Flow Velocity	18.69	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>58.71</b>	<b>cfs</b>	

Pipe ID		Culvert 5	
<b>25-Year Peak Runoff Rate</b>	<b>1.96</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>1.96</b>	<b>cfs</b>	
Pipe Diameter	<b>12</b>	in	
Cross Sectional Area	0.79	sf	
Slope	0.1000	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	3.14	ft	
Hydraulic Radius	0.40	ft	
k/n	114.62		
Flow Velocity	14.38	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>11.30</b>	<b>cfs</b>	

Pipe ID		Culvert 6	
<b>25-Year Peak Runoff Rate</b>	<b>6.99</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>6.99</b>	<b>cfs</b>	
Pipe Diameter	<b>12</b>	in	
Cross Sectional Area	0.79	sf	
Slope	0.0400	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	3.14	ft	
Hydraulic Radius	0.40	ft	
k/n	114.62		
Flow Velocity	9.10	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>7.14</b>	<b>cfs</b>	

Pipe ID		Culvert 7	
<b>25-Year Peak Runoff Rate</b>	<b>2.47</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>2.47</b>	<b>cfs</b>	
Pipe Diameter	<b>12</b>	in	
Cross Sectional Area	0.79	sf	
Slope	0.0500	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	3.14	ft	
Hydraulic Radius	0.40	ft	
k/n	114.62		
Flow Velocity	10.17	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>7.99</b>	<b>cfs</b>	

Pipe ID		Culvert 8	
<b>25-Year Peak Runoff Rate</b>	<b>38.09</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>38.09</b>	<b>cfs</b>	
Pipe Diameter	<b>48</b>	in	
Cross Sectional Area	6.28	sf	
Slope	0.1800	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	10.28	ft	
Hydraulic Radius	0.72	ft	
k/n	114.62		
Flow Velocity	35.01	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>220.00</b>	<b>cfs</b>	

Pipe ID		Culvert 9	
<b>25-Year Peak Runoff Rate</b>	<b>3.50</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>3.50</b>	<b>cfs</b>	
Pipe Diameter	<b>12</b>	in	
Cross Sectional Area	0.79	sf	
Slope	0.1400	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	3.14	ft	
Hydraulic Radius	0.40	ft	
k/n	114.62		
Flow Velocity	17.02	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>13.37</b>	<b>cfs</b>	

Pipe ID		Culvert 10	
<b>25-Year Peak Runoff Rate</b>	<b>6.89</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>6.89</b>	<b>cfs</b>	
Pipe Diameter	<b>12</b>	in	
Cross Sectional Area	0.79	sf	
Slope	0.0800	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	3.14	ft	
Hydraulic Radius	0.40	ft	
k/n	114.62		
Flow Velocity	12.87	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>10.10</b>	<b>cfs</b>	

Pipe ID		Culvert 11	
<b>25-Year Peak Runoff Rate</b>	<b>3.80</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>4.15</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>7.95</b>	<b>cfs</b>	
Pipe Diameter	<b>18</b>	in	
Cross Sectional Area	1.77	sf	
Slope	0.0100	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	4.71	ft	
Hydraulic Radius	0.52	ft	
k/n	114.62		
Flow Velocity	5.96	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>10.53</b>	<b>cfs</b>	

Pipe ID		Culvert 12	
<b>25-Year Peak Runoff Rate</b>	<b>8.90</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>8.90</b>	<b>cfs</b>	
Pipe Diameter	<b>15</b>	in	
Cross Sectional Area	1.23	sf	
Slope	0.0900	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	3.93	ft	
Hydraulic Radius	0.46	ft	
k/n	114.62		
Flow Velocity	15.83	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>19.43</b>	<b>cfs</b>	

Pipe ID		Culvert 13	
<b>25-Year Peak Runoff Rate</b>	<b>1.00</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>1.00</b>	<b>cfs</b>	
Pipe Diameter	<b>12</b>	in	
Cross Sectional Area	0.79	sf	
Slope	0.0100	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	3.14	ft	
Hydraulic Radius	0.40	ft	
k/n	114.62		
Flow Velocity	4.55	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>3.57</b>	<b>cfs</b>	

Pipe ID		Culvert 14	
<b>25-Year Peak Runoff Rate</b>	<b>2.25</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>2.25</b>	<b>cfs</b>	
Pipe Diameter	<b>12</b>	in	
Cross Sectional Area	0.79	sf	
Slope	0.0750	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	3.14	ft	
Hydraulic Radius	0.40	ft	
k/n	114.62		
Flow Velocity	12.46	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>9.78</b>	<b>cfs</b>	

Pipe ID		Culvert 15	
<b>25-Year Peak Runoff Rate</b>	<b>1.69</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>1.69</b>	<b>cfs</b>	
Pipe Diameter	<b>12</b>	in	
Cross Sectional Area	0.79	sf	
Slope	0.0250	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	3.14	ft	
Hydraulic Radius	0.40	ft	
k/n	114.62		
Flow Velocity	7.19	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>5.65</b>	<b>cfs</b>	

Pipe ID		Culvert 16	
<b>25-Year Peak Runoff Rate</b>	<b>1.90</b>	<b>cfs</b>	
<b>Additional Upstream Flow</b>	<b>0.00</b>	<b>cfs</b>	
<b>Total Flow to Pipe</b>	<b>1.90</b>	<b>cfs</b>	
Pipe Diameter	<b>12</b>	in	
Cross Sectional Area	0.79	sf	
Slope	0.0125	ft/ft	
Mannings 'n'	0.013		
Wetted Perimeter	3.14	ft	
Hydraulic Radius	0.40	ft	
k/n	114.62		
Flow Velocity	5.09	ft/s	
<b>Maximum Flowing Full Capacity</b>	<b>3.99</b>	<b>cfs</b>	

Pipe ID	Culvert 17	
25-Year Peak Runoff Rate	1.06	cfs
Additional Upstream Flow	0.00	cfs
<b>Total Flow to Pipe</b>	<b>1.06</b>	<b>cfs</b>
Pipe Diameter	12	in
Cross Sectional Area	0.79	sf
Slope	0.0250	ft/ft
Mannings 'n'	0.013	
Wetted Perimeter	3.14	ft
Hydraulic Radius	0.40	ft
k/n	114.62	
Flow Velocity	7.19	ft/s
<b>Maximum Flowing Full Capacity</b>	<b>5.65</b>	<b>cfs</b>

## LEVEL SPREADER CALCULATIONS - ROXBURY WIND PROJECT

LEVEL SPREADER ID	Impervious Area (acres)	Vegetated Area (acres)	Runoff Coefficient	Rainfall Intensity (in/hr)	Total Area (acres)	Q <sub>10</sub> (cfs)	Calculated Buffer Length (ft)	Buffer Length Used (ft)
LS-1	0.03	0.52	0.24	4.27	0.55	0.55	2.21	10.00
LS-2	0.02	0.82	0.22	4.27	0.84	0.79	3.18	10.00
LS-3	0.06	0.07	0.50	4.27	0.13	0.28	1.10	10.00
LS-4	0.16	2.72	0.24	4.27	2.88	2.95	11.78	15.00
LS-5	0.36	5.16	0.25	4.27	5.53	5.81	23.23	25.00
LS-6	0.36	2.15	0.30	4.27	2.50	3.20	12.81	15.00
LS-7	0.72	5.55	0.28	4.27	6.27	7.50	29.99	30.00
LS-8	0.35	0.31	0.57	4.27	0.65	1.60	6.41	10.00

**Rational Method Flow Computation - Roxbury Wind Project**

Area Tributary To Discharge	Total Developed Area (sf)	Total Impervious Area (sf)	Total Pervious Area (sf)	Total Area, A (ac)	Weighted C	25 Year Flow, Q (cfs)
1	8627	534	8093	0.20	0.24	0.24
2	23957	1223	22734	0.55	0.24	0.66
3	36751	1070	35681	0.84	0.22	0.94
4	1346959	10041	1336918	30.92	0.21	32.17
5	77362	1898	75464	1.78	0.22	1.96
6	279821	5865	273956	6.42	0.21	6.99
7	88787	4984	83803	2.04	0.24	2.47
8	1588118	13739	1574379	36.46	0.21	38.09
9	125540	7051	118489	2.88	0.24	3.50
10	240731	15839	224892	5.53	0.25	6.89
11	108974	15528	93446	2.50	0.30	3.80
12	272954	31267	241687	6.27	0.28	8.90
13	23617	5564	18053	0.54	0.36	1.00
14	66652	8556	58096	1.53	0.29	2.25
15	44199	8158	36041	1.01	0.33	1.69
16	28511	15210	13301	0.65	0.57	1.90
17	21366	6859	14507	0.49	0.42	1.06

replacement

**Assumptions**

Pervious C	0.20	
Impervious C	0.9	
25 Year Storm Event (in/hr)	5.07	rumford
Rational Flow, Q	=C*I*A	



**POST-CONSTRUCTION ROADSIDE BIO-SWALE WATER QUALITY CALCULATIONS/SUMMARY -  
ROXBURY WIND PROJECT**

**CHECK DAM SPACING FOR VARYING SLOPES:**

ROAD WIDTH	24'				34'				40'	
	SLOPE %	0-4	4-8	8-12	12-16	0-4	4-8	8-12	12-16	0-4
FREQUENCY OF CHECK DAM (FT)	135	65	45	30	105	50	35	25	90	45
STORAGE REQUIRED (CF)	148.50	71.50	49.50	33.00	150.50	71.67	50.17	35.83	147	73.5
STORAGE PROVIDED (CF)	152.54	75.90	50.18	37.20	152.54	75.90	50.18	37.20	152.54	75.90

**STORAGE REQUIRED PER LINEAR FOOT OF ROAD:**

ROAD WIDTH	IMPERVIOUS (CF)	LANDSCAPED (CF)	TOTAL (CF)
24'	1	0.1	1.1
34'	1	0.43	1.43
40'	1	0.63	1.63

**TREATMENT STATIONING:**

STATION	LENGTH	SLOPE
101+00 - 113+00	1200'	13-14%
113+00 - 118+00	500'	10-15%
118+00 - 139+00	2100'	15.3%
139+00 - 145+00	600'	1.4%
145+00 - 151+00	600'	8.8%
151+00 - 159+00	800'	14.6%
159+00 - 161+00	200'	1.7%
161+00 - 168+00	700'	15.8%
168+00 - 174+00	600'	8.8%
174+00 - 179+00	500'	2.0%
179+00 - 182+50	350'	6.4%
182+50 - 189+98	748'	0.5%
200+00 - 202+70	700'	1.0%

**WATER QUALITY SUMMARY:**

	REQUIRED	PROVIDED
PERCENT OF IMPERVIOUS TREATED	75%	96.5%
PERCENT OF DEVELOPED TREATED	50%	51.2%

\*LINEAR PORTION OF PROJECT

**BASIC STANDARDS:  
EROSION & SEDIMENTATION CONTROL PLAN**

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**BASIC STANDARDS  
EROSION & SEDIMENTATION  
CONTROL REPORT**

**ROXBURY WIND PROJECT**

**Submitted to:**

Maine Department of  
Environmental Protection  
17 State House Station  
Augusta, ME 04333

**Submitted by:**

RoxWind LLC

**Prepared by:**

Stantec Consulting Services Inc.  
482 Payne Road  
Scarborough, ME 04074

May 9, 2018

**BASIC STANDARDS  
EROSION & SEDIMENTATION CONTROL REPORT**

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# **BASIC STANDARDS EROSION & SEDIMENTATION CONTROL REPORT**

Introduction

May 9, 2018

## **1.0 Introduction**

The following plan has been developed in support of the project Stormwater Management Application to provide a strategy for controlling erosion and sedimentation associated with the Roxbury Wind Project (project) both during and after site construction. The project is a proposed small-scale wind energy facility located in Oxford County, Maine, and includes four wind turbines, existing and new access roads and crane paths, 34.5-kilovolt electrical collector lines (the majority of which will be buried alongside project roads), and electrical generator lead down to the existing Roxbury Substation along Route 120. This plan is based upon sound conservation practices, including as applicable, those outlined in the "Maine Erosion and Sediment Control Best Management Practices" manual published by the Bureau of Land and Water Quality, Maine Department of Environmental Protection (MaineDEP; October 2016), the "Maine Erosion and Sediment Control Practices Field Guide for Contractors", and past experience of the Applicants in constructing wind projects in New England.

Details of erosion and sedimentation control during the construction of roadways and turbine pads can be found in the civil design plans included within the Stormwater Management Application.

### **1.1 Stormwater Management Measures**

Additional measures may be required to protect new stormwater conveyance or management systems due to changes in actual site conditions. For more information on stormwater management, see the Stormwater Management Report. For additional information on treatment systems, the contractor shall reference the Maine Stormwater Best Management Practices Manual, Volume III: BMP Technical Design Manual (revised May 2016).

### **1.2 Field Adjustments**

The Applicant expects that minor adjustments will be made during final design work and during construction based on conditions encountered in the field. As described below, the Applicant has identified changes that do not require a permit modification and that may be made (a) without advance notice to MaineDEP or, (b) that require prior approval by the third-party inspector or MaineDEP staff.

The following field and/or final design adjustments are authorized under the permit provided they do not result in new impacts to protected natural resources as defined under the Natural Resources Protection Act (38 MRSA Section 480-B(8)); do not increase overall project clearing; do not impact a new landowner; and meet the requirements of MaineDEP

## **BASIC STANDARDS EROSION & SEDIMENTATION CONTROL REPORT**

Construction Calendar

May 9, 2018

Chapter 500 Stormwater Management Standards. Any of these adjustments will be reflected in the final as-built drawings.

- (a) Examples of adjustments that may be made during construction and/or final design without advance notice to MaineDEP:
- Reduction in clearing, impervious surface, or size of structure; elimination of a structure; or relocation of a structure;
  - Location, dimension or addition of drainage culverts, level spreaders, rock sandwiches or other stormwater infrastructure, provided that the culvert does not convey a regulated stream and that the hydraulic capacity of the modified stormwater infrastructure meets design standards;
  - Changes to pole or anchor locations for the electrical collector, provided that any adjustment meets the applicable buffer requirements;
  - Maintenance within the footprint of existing roads with exception of any in-stream work or wetland impacts to be used for temporary construction access;
  - Changes of up to 10 feet in vertical roadway alignment and turbine pad elevation; and
  - Changes of up to 100 feet in either direction in horizontal roadway alignment and associated clearing, and in turbine clearing area, and in electrical collector alignment laydown/staging areas.
- (b) Adjustments that may be made upon prior approval by the third-party inspector or MaineDEP staff:
- Changes other than those identified in (a) and that do not otherwise require a permit amendment as determined by MaineDEP.

### **1.3 Construction Calendar**

The Contractor is required to give special attention to the sections pertaining to fall and winter construction, as well as to sensitive areas and requirements for temporary seeding, dormant seeding, and mulching. It is generally understood that project construction will take no longer than a year and that all project areas will be fully stabilized upon the completion of construction.

### **1.4 Definitions**

The following definitions are terms commonly used throughout this plan.

## **BASIC STANDARDS EROSION & SEDIMENTATION CONTROL REPORT**

Definitions

May 9, 2018

*Acceptance* – As used herein shall mean verification by the Owner, Third Party Inspector, and/or the Engineer that the specific erosion control measure or device to be accepted is adequately constructed, performs satisfactorily as intended, and is complete. Acceptance of a measure or device by the Owner, Third Party Inspector, or the Engineer shall be based upon visual observations and inspection and is not a warranty of compliance, compaction, structural integrity, workmanship, or other construction-related or qualitative factors that may require testing or other means of certification of compliance.

*Buffer strips* – Natural, undisturbed strips of natural vegetation or reseeded strips of close-growing vegetation adjacent to and downslope of developed areas.

- Buffer with stone bermed level lip spreaders: This buffer is used for larger, developed areas and uses a level spreader to create sheet flow onto the buffer.
- Roadside buffer adjacent to the downhill side of a permanent road: This buffer is used for dispersing and treating flow from a roadway when it directly enters the buffer surface as sheet flow.
- Ditch turn-out buffer: This buffer is used to divert roadway runoff collected in a ditch into an undisturbed areas sheet flow.

*Clearing* – Includes cutting and removing of vegetative cover. It does not include grubbing. Limited cutting, thinning, use of heavy equipment, and other clearing restrictions will apply to sensitive areas and wetland crossings

*Critical Areas* – Specific areas identified herein or subjected to significant erosion problems as observed in the field prior to, during, or following construction activities such as areas with steep slopes or channels in excess of eight percent, newly graded slopes, highly erodible soils that will be exposed for more than seven days, bare soils exposed during late fall and winter when no vegetation can grow, areas draining to and within 75 feet of a wetland, river/stream/brook, pond shoreline, or vernal pool.

*Earthwork* – Consists of the movement of soil by mechanical means including excavation, filling, grading, trenching, and shaping.

*Engineer* – As used herein shall mean a representative of the civil engineer of record or person designated by the Owner.

*Erosion and Sedimentation Controls* – Defined as the installation of silt fence, bales, erosion control berms, rip-rap, mulching, erosion control matting or netting, check dams, inlet protection, reinforced turf, erosion control mix, construction entrances, diversions, level spreaders, and any other temporary or permanent measures required herein.

*Grubbing* – The removal of grass, stumps, roots, and scrub required to begin earthwork. Grubbing is the initial clearing action that exposes soil to erosive forces (wind, rain).

## **BASIC STANDARDS EROSION & SEDIMENTATION CONTROL REPORT**

Schedule of Activities

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*Interim Period* – A period of time that an un-vegetated area sits un-worked, awaiting the next phase of work.

*Permanent or Final* – As used herein shall refer to the use or placement of erosion or sedimentation controls, seeding, or other measures, which will remain through final project completion.

*Seasons* – The following dates define the seasons as referred to herein:

Seasons	Dates (Seasonal dates may vary from year-to-year)
Winter	November 1 to April 15
Mud-Season	March 16 to April 30
Spring	May 1 to June 14
Summer	June 15 to September 15
Fall	September 16 to October 31

*Temporary* – As used herein shall refer to the use or placement of erosion or sedimentation controls, seeding, or other measures intended to be either removed, replaced, reworked, reseeded, or followed with permanent measures.

### **1.5 Schedule of Activities**

The following activities, erosion control measures, or other items are required for the construction of this project or require specific measures or scheduling of activities to be conducted or restricted during the various construction seasons as defined above. It is expected that the project will be constructed within one construction season, likely starting in early summer and proceeding through to late fall.

*Clearing* – Ground conditions permitting, clearing may occur at any time of the year.

*Critical Areas* – Work proposed in the defined critical areas may be conducted all year, ground conditions permitting. Some problem areas may become “critical areas” during the course of construction. Areas observed to be experiencing significant erosion problems shall be deemed critical areas and shall be stabilized with appropriate erosion control measures immediately prior to progressing with work in these areas as directed by the Engineer or Third Party Inspector.

*Erosion and Sedimentation Controls Installation* – Erosion control installation and maintenance shall occur all year long, except that such measures shall be installed prior to commencement of ground disturbance activities (see design plans for details and installation procedures).



## **BASIC STANDARDS EROSION & SEDIMENTATION CONTROL REPORT**

Schedule of Activities

May 9, 2018

*Road and Turbine Construction* – This construction is expected to occur in the spring, summer, and fall seasons. The work will involve heavy earthwork activity consisting of onsite sourced aggregate production, mainly from ledge blasting and processing. As aggregate material is produced it will be transported to road and turbine pad fill zones or as basic road base in the cut zones. Roadway surface and embankment shaping will occur concurrently along with all culvert installation and ditch shaping. Upon rough grading of the pad sites and the availability of delivery vehicles to deliver reinforcement steel and concrete, the turbine pads will be constructed. Once road conditions allow for turbine equipment delivery, the turbine components will be delivered for assembly and erection. Within these timeframes other activities including crane assembly, slope stabilization, electrical transmission line work and related activities may be occurring.

In the unlikely event that winter activity is required, the winter construction schedule must be followed (see General Construction Phase below). The project objective is to complete the majority of work over a single summer/fall period based on the project size and scale. The following requirement for access road construction will be adhered to in order to prevent erosion from taking place during winter construction:

- While the entire road system may be cleared in one effort, during the winter, the roads will be constructed in short segments of 500 feet or less where each segment is grubbed, constructed, and protected prior to earthwork on the next segment as approved by the Engineer. This construction sequence is intended to prevent large areas from being exposed, without temporary stabilization, to erosion during major rain events. A segment is defined as an area cleared and grubbed. See below for the stabilization schedule. Multiple segments in different areas of the project may be constructed concurrently.

The sequence of work will also require that the contractor make ready a supply of processed aggregate (i.e. processed blast rock) material for road construction prior to the onset of full scale road clearing and earthwork activity. In this way, the length of time that road segments are exposed and vulnerable to erosion may be minimized. Time of year and weather conditions may influence this approach; however, the ultimate objective and requirements of the Project's erosion control program are to avoid significant erosion and sediment transport out of the work zone. A careful construction sequence and utilization of the existing hillside road and ridgeline logging equipment trails will aid with achieving these project results.

*Temporary Timber Mat Bridge* – Temporary timber mat bridges will be used throughout the year as necessary for clearing and construction activities near resources such as tributary crossings or wetlands. Following construction, approximately 3.5 acres of the 6.3 acres of impervious area temporarily created for gravel construction surfaces will be restored to permanent vegetative cover, resulting in approximately 2.8 acres of new, permanent impervious areas (12-foot wide gravel roads, wind turbine foundations, and crane pads).

## **BASIC STANDARDS EROSION & SEDIMENTATION CONTROL REPORT**

Erosion Control Measures

May 9, 2018

*Road Restoration* – Upon completion of the turbine erection activities and all collection line installation, the contractor will complete road restoration and construction of the treatment swale measures along the roadside edges. Road restoration work will involve road grading to achieve proper cross slope development, construction of the treatment swale and soil filter media placement, and final coverage of organic material and seeding across all road areas and embankments beyond the 12' wide maintenance road and maintenance pads at turbine sites.

### **1.6 Erosion Control Measures**

#### **1.6.1 General**

The construction of this project may require or incorporate the following measures or practices as needed or applicable. Such measures, where indicated on the design plans, shall be implemented as shown, or as deemed necessary by the Third Party Inspector or Engineer. Additional measures not shown on design plans may be required as specified herein or requested by the Third Party Inspector or Engineer, as needed, in order to protect natural resources or offsite properties and prevent erosion and sedimentation.

*Bales* – Shall be installed along the contours in the locations and as detailed on the design plans. Straw (or hay) bales may be required in addition to silt fencing or other measures in sensitive areas as shown on Drawings. Bales are to be embedded four inches into the existing soil and staked with ends tightly abutting adjacent bales. Where staking and embedding of bales is impractical due to excessive roots, ledge, or other construction hazards, bale barriers may be substituted with erosion control mix berms as long as they are not installed in locations with concentrated flow.

*Construction Entrance* – A crushed stone-stabilized construction entrance will be installed wherever construction traffic will enter the public road system. The size, type, and locations of these shall be as shown and detailed in the design plans. Entrances shall be constructed with a 6-inch minimum layer of 2-inch stone. Stone entrances shall be placed on geotextile fabric and shall include a minimum 10-foot by 10-foot taper (or as needed to support large construction/delivery vehicles) on both sides of the entrance to allow for turning vehicles.

*Dust Control* – Contractor shall take necessary steps to control blowing and airborne movement of dust from exposed soil surfaces. Maintaining natural or temporary vegetation and/or mulching shall be used where practical. Mechanical sweepers shall be used where necessary to prevent and remove dust buildup on paved surfaces such as Horseshoe Valley Road and Route 120. Regularly traveled soil surfaces shall be maintained to minimize dust by periodically moistening bare areas with adequate water. Calcium Chloride solution spray should be used in areas experiencing significant dust problems and to reduce frequency of watering. Repetitive treatment shall be applied as necessary to accomplish

## BASIC STANDARDS EROSION & SEDIMENTATION CONTROL REPORT

Erosion Control Measures

May 9, 2018

adequate dust control (refer to Section B-5 in the "Maine Erosion and Sediment Control Best Management Practices" manual).

*Erosion Control Mix Berms* – May be installed in locations that do not have a concentrated flow. Erosion control mix berms are an approved alternative to silt fence provided they are not located in sensitive areas described above. Erosion control mix may be manufactured on or offsite and shall follow the guidelines outlined in Section B-1 in the "Maine Erosion and Sediment Control Best Management Practices". The composition specification outlined in Section B-1 should be used as a guideline but the actual mix design will be performance based. The mix shall be subject to testing if required by the Engineer or Third-Party representative.



*Level Lip Spreader* – Level lip spreader lengths are provided in the details in the design plans and will be 6-inches to 24-inches deep, stone-lined sump areas discharging over a level berm through a well vegetated buffer area. These spreaders will function to disperse channelized flow into shallow sheet flow. Construction and length of level lip spreaders shall be as detailed on the design plans.



*Matting* – Shall consist of straw, coconut or excelsior sandwiched between photodegradable netting. Matting may be substituted with sod where desired. Netting over straw mulch may be substituted for matting only when approved by the Engineer. Matting shall be used: (1) where indicated on the design plans; (2) in the base of swales with moderate slopes and erosive capability. High velocity ditch lining or geotextile soft armor may be required in steep ditches (> 8%) or areas receiving significant concentrated flows; (3) on steep slopes where rilling may occur or where mulching has proven to be ineffective in the field; or (4) where straw mulch has been determined to be ineffective based on observations made in the field or as directed by the Engineer or third party representative.



## BASIC STANDARDS EROSION & SEDIMENTATION CONTROL REPORT

Erosion Control Measures

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*Outlet Protection* – Riprap outlets (aprons or plunge pools) shall be placed in locations where indicated on the design plans, and in locations where flared end sections have proven to be inadequate to prevent scouring at the pipe outlet in the field, as directed by the Engineer or Third-Party representative. The riprap outlets shall be the same size as that specified on the design plans.



*Permanent Mulching and Revegetation* – Permanent mulch is long-term cover that provides a good buffer on and around disturbed areas. Permanent mulching with erosion control mix can be used as a permanent ground cover, as an overwinter stabilization mulch, or left to naturalize and revegetate to near natural conditions. It is not used to support grassy vegetation, but legumes or woody vegetation may be established if allowed to revert to natural conditions. Permanent mulch must not be used in areas of concentrated water flows, and any evidence of groundwater seepage on slopes may require the erosion control mix to be replaced with riprap. Erosion control mix can be manufactured on or off the project site. It shall consist primarily of organic material, separated at the point of generation and may include shredded bark, stump grindings, composted bark, or flume grit and fragmented wood generated from water-flume log handling systems. Wood chips, ground construction debris, reprocessed wood products, or bark chips will not be acceptable as the organic component of the mix. Erosion control mix composition shall be in accordance with Section A-1 of the “Maine Erosion and Sediment Control Best Management Practices” manual. Erosion control mix must be free of refuse, physical contaminants, and material toxic to plant growth.

*Riprap* – Shall be used in swales, steep slopes, and outlets as shown on the design plans to protect soils from excessive flow velocities. It shall be of the size and depths specified on the design plans; angular stone shall be used. Riprap may be required at locations where revegetation matting, high velocity ditch lining or soft armor is proven to be ineffective in the field as directed by the Engineer or Third-Party representative.



*Sediment Barrier Berms* – A sediment barrier is a berm installed across or at the toe of a slope and down gradient of disturbed earth. Its purpose is to intercept and retain small amounts of sediment from disturbed or unprotected areas of limited extent. For other sediment barrier

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use, see Section B-1 of the “*Maine Erosion and Sediment Control Best Management Practices*” manual. A sediment barrier is used where:

- Sedimentation can pollute or degrade a wetland or other water resource.
- Sedimentation will reduce the capacity of storm drainage systems or adversely flood adjacent areas.
- The contributing drainage area does not exceed 1/4 acre per 100 feet of barrier length; the maximum length of slope above the barrier is 100 feet; and the maximum gradient behind the barrier is 50 percent (2:1). If the slope length is greater, additional measures such as diversions may be necessary to reduce that length.
- Sediment barriers cannot be used in areas of concentrated flows. Under no circumstances should erosion control mix sediment barriers be constructed in streams or in swales.

*Silt Fence* – Shall be installed along the contours in the locations and as detailed on the design plans. Silt fence may be required in additional or other locations, not indicated on design plans, as warranted or determined by field conditions or as directed by the Engineer or Third-Party representative. Silt fence may also be required in addition to bales or other measures in sensitive areas as shown on the design plans. Where staking and embedding fabric is impractical due to excessive roots, ledge, or other construction hazards, silt fence may be substituted with erosion control mix berms or placement of six inches of suitable non-organic material along fabric flap on upslope side of fence, in lieu of burying fabric in trench.



*Stone Check Dams* – Shall be installed in existing and proposed swales or at culvert inlets as shown on the design plans. These check dams serve to reduce flow velocities in swales thus helping to reduce rilling. Check dams shall be constructed with a six-inch tapered spillway at the center as shown on design plans to prevent breaching and scour at the outer edges along the sides of the ditch.



*Temporary Mulching* – Shall consist of spreading of straw (or hay) mulch or erosion control mix over bare or disturbed areas. It shall be applied at the

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rates described in the Temporary Seeding and Mulching Schedule described below. Alternate mulch materials or methods such as hydro seeding may be used only when approved by the Engineer or Third-Party representative. Mulching shall be substituted with matting in locations where it has proven to be ineffective in the field. Mulching rates shall be doubled where requested by the Engineer based on observations in the field or in locations undergoing winter construction.

### 1.7 Erosion Control Execution

#### 1.7.1 General Construction Phase

The following general practices will be used to prevent erosion during construction of the project. Refer to design plans for applications, and installation methods. If the Contractor is unclear regarding the use, location, installation, intended performance, or maintenance of any prescribed erosion control measures, the Contractor shall refer to the "Maine Erosion and Sediment Control Best Management Practices" Manual for detailed procedures or contact the Engineer or Third-Party Representative for assistance.

**NOTE: Locations of erosion control measures are shown on design plans as typical for general purposes only to indicate the intent. Final locations should be selected based on actual field conditions and as site conditions warrant.**

*Construction Traffic* – Construction traffic will be directed over the stabilized construction entrances and proposed roads. The crushed stone construction entrance shall be maintained with the addition of more crushed stone as needed or as the voids become filled. The public roadway shall be swept as soon as possible, but no later than at the end of each work day, should mud be tracked onto it.

*Erosion Control Installation* – Prior to the start of grubbing, silt fence, bales, erosion control mix berms, stabilized construction entrances, or other appropriate measures shall be installed adjacent to construction areas, at the toe of slopes and in areas as shown on design plans, or as otherwise required to protect against construction related erosion. Immediately following construction of culverts and swales, stone check dams, and ditch linings shall be installed, as shown on the design plans. Prior to start of construction there will be a mandatory pre-construction meeting to discuss the construction schedule and the erosion and sedimentation control plan. The meeting shall be attended by the owner (or owner's representative), the Engineer, the contractor, the third-party inspector, and MDEP staff.

*Following Clearing* – Only those areas under active construction shall be left in an untreated or unvegetated condition.

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*Grading* – Grading will be held to a maximum 2:1 slope where practical. Greater slopes may be used in ledge cut or stable material as shown in the design drawings. Finish-graded areas shall be stabilized with permanent seeding and mulching or other accepted means immediately after final grading is complete. If final grading will not be completed immediately, refer to the *Temporary Seeding and Mulching Schedule* detailed below. It is understood that immediately means within five days of the completion of work. For time periods longer than five days, refer to *Permanent Seeding and Mulching Plan* below. A supply of onsite sourced processed ledge aggregate should be available prior to full scale road earthwork activity in order to minimize the lapse of time from initial road subgrade preparation and road building aggregate placement.

*Monitoring Schedule* – The Contractor shall be responsible for installing, monitoring, maintaining, repairing, replacing and/or removing the temporary erosion and sedimentation controls as specified herein or as directed by the Engineer or Third-Party representative, or shall appoint a qualified subcontractor to do so, as follows:

- The Contractor or approved designated Inspector shall perform weekly inspections of the site until the site is stabilized. Inspections may be performed on a bi-weekly schedule when work has abated for more than one week.
- Maintenance measures will be performed as needed during the entire construction cycle. After each rainfall, and *prior to* predicted significant rainfall events (> 1"), a visual erosion controls inspection will be made by the Contractor or approved designated Inspector to insure their continuing function as designed.
- Stone check dams, bale barriers, drop inlet barriers, erosion control mix berms, silt fence, and mulch shall be inspected and repaired once a week or immediately following any significant rainfall. Sediment trapped behind these barriers shall be removed when it reaches a depth of 6 inches (or 1/2 the height of the dam for check dams) and redistributed to areas undergoing final grading.
- Near completion of the construction and after the site is reseeded and stabilized, the Contractor shall inspect, clean, maintain, repair, re-stabilize, or revegetate all drainage structures, storm drains, culverts, level spreaders and ditches prior to acceptance by the Owner.

*Permanent Seeding and Mulching Plan* – The following general practices will be used to re-establish final vegetation.

- Loam will be spread over disturbed areas and graded to a uniform depth and a natural appearance. Loam shall be as specified or approved by the Engineer or Third-Party representative.
- Final seeding shall be completed within 7 days following final topsoil and loam grading for non-critical areas. Final seeding shall be completed within 48 hours or prior to any

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storm event, whichever occurs first, following topsoil and loam grading for critical areas. All final fertilizing and seeding shall adhere to these specifications.

- Seeded areas shall be mulched the same work day. Mulch shall consist of straw/hay, hydro-mulch, or any suitable substitute deemed acceptable by the engineer. Straw, hay, or other mulch applied without a tackifier/binder will be anchored with biodegradable netting in the following areas: the base and side slopes of grassed ditches, slopes steeper than 15%, and exposed ridges. Mulched areas shall be monitored according to the Monitoring Schedule above. Should mulching prove to be ineffective, straw matting or excelsior matting will be used in its place.
- Straw mulch shall be applied at the rate of 2 tons per acre (90 lbs. or 2 bales/1,000 SF) unless otherwise specified.
- Hydro-mulch shall consist of a mixture of tackifier, wood fiber or paper fiber and water sprayed over a seeded area. Hydro-mulch shall not be used during the fall, winter, or mud season unless approved by the Engineer.
- Dormant seeding shall not occur unless approved by the Engineer or Third-Party representative. Should seeding be necessary between November 1 and April 15, the following procedure shall be followed.
  - Only unfrozen loam shall be used.
  - Loaming, seeding, and mulching will not be done over snow cover. If snow exists, it must be removed prior to placement of seed.
  - No permanent seeding will be done during fall, winter, or mud season unless specifically approved by the Engineer or Third-Party representative. If attempted, the normal seed application rate shall be doubled. Reseeding in spring by Contractor will be required in all areas with insufficient growth.
  - Where temporary seeding is required, the rates specified in the *Temporary Seeding and Mulching Schedule* below shall be adhered to.
  - Fertilizing, seeding, and mulching shall be done the same work day that loam is spread on any area. Mulch shall consist of hay or straw applied at twice the normal rate, as specified in the *Table 14-1: Stabilization Schedule* below.
  - All mulch applied to slopes steeper than 5% during the winter construction period will be anchored with biodegradable netting or approved alternative. At the Engineer's or Third-Party representative's direction, straw matting or excelsior matting may be substituted for the straw mulch and biodegradable netting.
  - Following final seeding, the site will be inspected every 30 days until 80 percent cover has been established. Reseeding and mulching shall be carried out in areas where inadequate catch is observed until adequate growth is established in seeded areas, as agreed upon by the Engineer. The Contractor may be required to reseed during the following spring subsequent to winter or fall construction and seeding in order to provide 90 percent vegetative cover as required for Acceptance by the Owner.



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- Erosion control mix utilized for permanent stabilization and to promote natural revegetation may be used in lieu of loaming and seeding.

*Temporary Seeding and Mulching Schedule* – During construction, all disturbed areas shall adhere to the schedules specified in Tables 1 and 2 below. Refer to *Permanent Seeding and Mulching Plan* above for permanent seeding and mulching requirements.

- The Contractor shall be responsible for monitoring daily weather reports when working in identified sensitive areas and for monitoring weekly reports in all other areas. The Contractor shall adjust the work schedule in anticipation of rains and shall stabilize the site as indicated or required.
- All completed areas that have been loamed and/or finish graded shall be permanently reseeded in accordance with the *Permanent Seeding and Mulching Plan* above.
- Temporary mulching or seeding shall be done immediately for any non-critical area not to be worked for an interim period of more than 7 days. Temporary mulching and seeding of critical areas shall occur within 48 hours of initial disturbance or prior to any storm event, whichever occurs first. Stabilization and seeding requirements shall be determined in accordance with *Table 1: Stabilization Schedule* and *Table 2: Temporary Seeding Schedule* and shall be implemented at the beginning of the expected interim period. In no case, shall any disturbed soil be left unstabilized for more than 30 days.
- Interim periods for sensitive and critical areas are indicated in the Tables 1 and 2. However, exposed or bare soil in these areas shall be mulched at the completion of work, each day, if significant rainfall is predicted or eminent.
- Mulch application rate shall be doubled during winter construction. Mulch shall be applied at the end of each day's work to disturbed soil areas if the area has been fine graded or if snow is predicted or imminent. In no case, shall any area of disturbed soil be left without mulch or other surface cover for more than 7 days during the winter construction period.
- Permanent seeding shall not be attempted during the fall or winter seasons unless otherwise approved by the Engineer or Third-Party representative. Should seeding be approved by the Engineer or Third-Party representative during fall or winter seasons, the Contractor shall follow procedures for dormant seeding. See *Permanent Seeding and Mulching Plan* above for dormant seeding requirements. However, vegetation must be inspected and reseeded by Contractor as necessary in the following spring to ensure good vegetative cover. Acceptance of dormant seeding shall not occur until after May 15, in the following spring.
- Temporary seeding and mulch shall be inspected and maintained or repaired weekly. At a minimum, 75 percent of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made, and other temporary measures used in the interim (e.g., mulch, filter barriers, check dams, bales). Mulch shall be reapplied as necessary to completely cover soil.

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- Areas within 75 feet of a protected natural resource shall be stabilized with temporary mulching or temporary seeding with mulching and have a sediment barrier installed between the area and resource within 48 hours or prior to any storm event, whichever occurs first.

*Ditch Stabilization Plan* – Any section of rough-graded ditch will have stone check dams installed in the ditch within 24 hours to prevent ditch scouring. Any section of finish-graded ditch will be stabilized with permanent lining of grass and or riprap within 7 days for ditches in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, for culverts in critical areas.

*Culvert Inlet and Outlet Stabilization Plan* – Any culvert installed on the project shall have the appropriate inlet and outlet protection installed within 7 days for culverts in non-critical areas and within 48 hours or prior to any storm event, whichever occurs first, for culverts in critical areas.

<b>Table 1 STABILIZATION SCHEDULE</b>		
<b>Maximum Expected Interim Period* - (Days)</b>	<b>Temporary Mulching (Hay)</b>	<b>Temporary Seeding</b>
0-7 (0-2)	None	None
7-30 (2-14)	2-bales/1,000 SF	None
30-60 (14-30)	2-bales/1,000 SF	(per Table 2: Temporary Seeding Schedule)
More than 7 days during winter season	4-bales/1,000 SF	Dormant seeding only

\* Values in parentheses indicates interim period for sensitive and critical areas.  
\*\* Mulch application rates shall be doubled for winter construction.

<b>Table 2 TEMPORARY SEEDING SCHEDULE</b>			
<b>Seed</b>	<b>Seeding Rate (lbs/1,000 sq. ft.)</b>	<b>Seeding Depth (Inches)</b>	<b>Recommended Seeding Dates</b>
Annual Rye Grass	0.9	1/4	4/1 to 7/1
Sudan Grass	0.9	1/2	7/1 to 8/15
Perennial Rye Grass	1.8	1/4	8/15 to 9/15
Winter Rye Grass	2.6	1	9/15 to 10/15
Dormant Seeding	3.5		
50% Winter Rye	(2.6)	1	10/15 to 3/31
50% Annual Rye	(0.9)		

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<b>Table 3 PERMANENT SEEDING SCHEDULE</b>		
<b>Location</b>	<b>Seed</b>	<b>Percent By Weight</b>
Upland Areas with Loam Cover	Tall Fescue	35%
	Creeping Red Fescue	30%
	Perennial Ryegrass	20%
	Annual Ryegrass	15%
Upland Areas with Erosion Control Mix Cover	Crown Vetch	50%
	Perennial Lupine	25%
	Crimson Clover	15%
	Annual Rye	10%
Slopes and Ditches Below Water Table or Line of Seepage	Creeping Red Fescue	47%
	Red Top	6%
	Tall Fescue	47%

*Topsoil* – Topsoil will be stockpiled on-site when necessary in areas that have minimum potential for erosion, such as flat slopes or on-site borrow pits, and will be kept as far as possible from existing drainage areas. Stockpiles expected to remain longer than 15 days shall be encircled with bales, erosion control mix berms, or silt fence at the down gradient sides of the stockpile and mulched with a second application of hay mulch and anchored with biodegradable netting if deemed necessary by the Engineer or Third-Party representative (Maine Construction General Permit, Appendix A (6) a-d).

*Winter Construction* – For any work proposed during the winter season, the Contractor shall adhere to the following practices.

- Limit the exposed area to those areas in which work is to occur during the following 15 days and that can be mulched in one day prior to any snow event.
- Where required and approved by the Engineer or Third-Party representative, installation of silt fence may be modified from the detail on the design plans to substitute six inches of suitable non-organic material over the bottom of the silt fence in lieu of trenching and backfilling fabric or erosion control mix berm/barrier.
- Mulching and seeding rates shall adhere to the *Temporary Seeding and Mulching Schedule* above. *Note that all mulching rates shall be doubled as shown in the above table and shall follow the sensitive area schedule during winter construction.*
- Permanent seeding shall not be attempted by the Contractor during winter season unless otherwise approved by the Engineer or Third-Party representative.

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### 1.7.2 Erosion Control Removal

Removal of temporary erosion control measures shall be the responsibility of the Contractor. Erosion controls shall remain in place and will be maintained by the Contractor until all related construction is complete and the area has been stabilized. Erosion control mix will be used to revegetate roads/pads and should be left in place.

An area is considered stable if a 90 percent cover of vegetation has been established or riprap or other permanent measures are in place and functioning properly.

Bales and silt fence shall be removed within 30 days of final stabilization. The bales and silt fence shall be disposed of legally and properly off-site. Sediment trapped behind these controls shall be distributed to an area undergoing final grading and graded in an aesthetic manner to conform to the topography, and fertilized, seeded and mulched, or otherwise stabilized, in accordance with the rates previously stated. Erosion control mix berms shall be knocked down and spread to blend with existing ground conditions.

The sediment trapped behind/around/in stone check dams, behind barriers, and sedimentation basins, shall be removed and transported off-site, or to an upslope area undergoing final grading. The sediment trapped by these devices shall not be regraded locally since they exist in drainage ways.

The rip-rap and stone from the check dams may be either removed or regraded in an aesthetic manner that does not inhibit flow or create the potential for erosion.

Once the trapped sediments have been removed from the temporary sedimentation devices, the disturbed areas will be loamed (if necessary), fertilized, seeded and mulched, or otherwise stabilized, in accordance with the rates previously stated.

## 1.8 Housekeeping Standards

These performance standards apply to the project:

- 1. Spill Prevention:** Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop, and implement as necessary, appropriate spill prevention, containment, and response planning measures.

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**NOTE:** Any spill or release of toxic or hazardous substances must be reported to the MaineDEP. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day.

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- 2. Groundwater Protection:** During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area, in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.

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**NOTE:** Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-C(1).

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- 3. Fugitive Sediment and Dust:** Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately and no less than once a week and prior to significant storm events. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

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**NOTE:** Dewatering a stream without a permit from the Department may violate state water quality standards and the Natural Resources Protection Act.

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- 4. Debris and Other Materials:** Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.

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**NOTE:** To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

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- 5. Excavation Dewatering:** Excavation dewatering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and

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hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin, or geotextile filter bag (e.g. Dirtbag®). Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.

### **1.9 Conclusion**

If constructed in conformance with the project design plans and these basic standards, the project is not expected to result in any significant erosion or sedimentation either on or off the site.