EXHIBIT B.14 SOILS MAPPING, EROSION CONTROL AND STORMWATER MANAGEMENT

B.14.1 Soils Mapping

A site-specific soils survey was completed for the project area during the summer of 2009. Through consultation with David Rocque, Maine State Soil Scientist, it was determined that a Class L soil survey would be appropriate to characterize the soils found on the site for the proposed Kibby Expansion Project. Attachment B.14-1 is the Soil Survey Report, which includes a description of soil units, drainage classes, slopes, and an evaluation of soil suitability for the proposed project. Soils mapping is also included with the report.

B.14.2 Erosion Control

The erosion control plan is provided in Attachment B.14-2, which includes provisions for planning, temporary and permanent measure use, stockpile stabilization, seasonal work differences (winter construction), revegetation plans, and inspection and maintenance. This plan was developed in consultation with the State Soil Scientist and incorporates the "toolbox" approach to construction which allows for field judgment to choose the best practice to suit the circumstances. The plan is based on the plan approved in the Kibby Project, as updated based on construction of that project. Lessons learned through construction at the Kibby Project are also incorporated into plans and designs for the Kibby Expansion Project.

B.14.3 Stormwater Management

Per the LURC Chapter 10, Sub-chapter III Land Use Standards, the Project must meet the following stormwater management criteria: Surface Water Quality (for the new or improved access roads, crane (ridge) roads, wind turbine generator ("WTG") assembly pads, and substation), Phosphorous Control (for the portions of the Project that are located in the Chain of Ponds and Gold Brook/Flagstaff Lake watersheds), and Erosion and Sedimentation Control (for all temporary and permanent disturbed areas). Due to the size and distance of the Project from downstream properties, the watershed water quantity calculations consists of a curve number comparison for the pre- and post-development conditions for the contributing watershed.

The curve number comparison calculation utilizes the hydrologic soil information from the medium intensity soil survey of Somerset County, parts of Franklin, and Oxford Counties. Curve numbers based on the cover type and soil group are referenced in Table 2-2c of the USDA Urban Hydrology for Small Watersheds TR55 manual. A weighted curve number was generated by averaging the curve numbers associated with areas of the various cover types and their associated hydrologic soil group.

Phosphorous control is required for the portions of the wind farm located within the Chain of Ponds and Gold Brook/Flagstaff Lake watersheds. The Phosphorous calculations are based on the methodology used in Volume II of the Maine DEP Stormwater BMP Manual "Phosphorous Control in Lake Watersheds A Technical Guide to Evaluating New Development."

The Project will disturb more than one acre of land, therefore the standards of the Maine Construction General Permit must be met. During the construction process, erosion and sedimentation control measures will be implemented and maintained per the Maine Erosion and Sedimentation Control BMP's. Stabilization measures for the site include both temporary and permanent erosion and sedimentation controls; appropriate design of conveyance swales, culvert inlet and outlet protection, and channel protection (where applicable). Site stabilization includes evaluation of slope stability, erosion protection for earthen cut and fill slopes, stabilization of disturbed areas, and considers provision for future maintenance of the site. These treatment practices are used to reduce the impacts of site runoff on downstream water quality.

B.14.1.1 Existing Site Conditions

With the exception of the portions of the Project along the existing Mile 5 Road and short section of the Wahl Road, the existing Project site is undeveloped woodlands. The wooded areas are well vegetated with a mixed growth of small to large trees and good ground cover. Some portions of the site have been harvested for timber, but have reverted back to well-established small to medium sized trees and brush.

The topography and land surface within the Sisk range varies from steep in the higher elevations to moderately steep, to a milder slope as it approaches Kibby Stream and Clearwater Brook, to the east and west, respectively. Elevations range from 3,200 to 3,300-feet at the ridge tops to 2,200-feet at Kibby Stream. Slopes range from 25 percent ("%") to 30% along the ridge tops, with steeper slopes of 30% to 50% in the mid-level elevations and a gentler slope of 10% to 20% as one approaches Kibby Stream.

B.14.1.2 Proposed Development

The proposed Kibby Expansion Project includes 15 wind turbines located along the Sisk Mountain ridgeline, adjacent to and west of the current Kibby Project B Series. Associated elements of the Project include access to the turbines utilizing the existing roadway network to the greatest extent possible, some new access roads and ridgeline roads connecting the turbines, and 34.5 kilovolt ("kV") electrical interconnections (collector lines) from the turbines to a common, newly proposed Kibby Expansion Substation. A short 115 kV electric transmission tap line between the new Kibby Expansion Substation and the existing Kibby Project 115 kV electric transmission line is also proposed.

B.14.1.3 Stormwater Management Approach

The Plan and Profile sheets provided in the Permit Plan Set located in Attachment B.13-1 reflect specific stormwater design measures for each planned roadway. However, it is acknowledged that the final selection of appropriate design elements can only be made based on actual, in-field conditions and professional engineering judgment. Therefore, the plans also reflect a series of design measures, referred to as a "toolbox," that will be selected as appropriate to respond to a range of anticipated site conditions. These techniques have been developed and modified through a series of site visits, meetings, and discussions with regulatory agencies (including LURC, DEP, and the Maine State Soil Scientist), as well as experience gained on the Kibby Project.

Given the hydrology of the site, special design emphasis was placed on handling of surface runoff and subsurface drainage. In general, surface runoff is handled by maintaining overland flow where possible, and re-establishing overland flow (through the use of ditch turnouts and plunge pools), as needed, for distribution of concentrated surface runoff. For subsurface drainage, measures are proposed to maintain subsurface drainage across the roadway where cuts occur in areas of shallow groundwater. Maintenance of the subsurface flows is provided to reduce the potential for creating new seeps or springs. Such measures, outlined on the drawings on sheets C-16 through C-22 in Attachment B.13-1, include a "rock sandwich" drainage blanket (or rock mattress), as well as a series of drainage trenches. Typical roadway sections and drainage controls are also shown on sheets C-16 through C-22, as are erosion control measures.

Construction of the roads between the turbines along the ridgelines will likely occur in areas where deeper groundwater and drainage characteristics will not necessitate the use of conventional drainage conveyance measures. However, TransCanada will ensure oversight of the construction effort by an on-site engineer to allow for appropriate design adjustments to reflect observed field conditions. In this way, roadway construction can minimize its affect on hydrologic conditions at the site and ensure successful long-term stability and function.

During construction of the access roads, particularly at the lower elevations, excavations may expose springs or seeps. As indicated previously, permanent measures will be constructed (i.e., drainage blankets or mattresses) to manage this subsurface flow. To control seepage during construction, while cut and fill operations are still on-going, the contractor is required to use temporary flexible pipe to collect and convey the seeps through the construction site, discharging in a manner to avoid scour/erosion problems down slope. Temporary channels and/or berms and check dams are specified to be used to impound and direct seep drainage to the temporary flexible pipes.

B.14.1.4 Roadway Culverts

As discussed with David Rocque, Soil Scientist for the State of Maine, the use of concentrated treatment structures and ditching should be minimized, where possible, in the stormwater design. Where possible, structures that concentrate run-off have been eliminated. Roadway culverts have been placed where necessary to carryflow-through runoff from the mountainside beneath roads and then redistribute as sheet flow. Conveyance swales are used in conjunction with culverts where access roads parallel adjacent embankment slope. Inlet and outlet protection are used at culverts that convey existing channelized flow to dissipate energy and reduce the effects of concentrated flows. Rock sandwiches are used at wetland crossings without channelized flow and groundwater seeps to avoid the creation of channelized water. As mentioned above, it should be noted that the number of culverts shown on the Project drawings represents the expected worst case condition and therefore is considered a conservative approach. Rock sandwiches may be installed at some proposed culvert locations based on review of the actual field conditions at the time of construction (the "toolbox approach").

Access road culverts are designed to convey a 10-year 24-hour storm event. Culverts are specified to be placed with a minimum of 12" of cover over the pipe. Round corrugated plastic pipes ("CPP") with a smooth wall interior are proposed at all locations with the exception of the larger stream crossings at access road stations 35+85, 36+50, 45+20, and 56+50, which have the highest potential for fish passage. At these locations, corrugated metal pipe arch culverts are proposed to provide a wider and deeper flow at the bottom of the culvert to enhance fish passage. The minimum culvert size proposed at any location is 18-inches. Culvert sizing calculations did not take into account the passage of water through nearby rock sandwiches and therefore some culverts are upsized which, again, will enhance the potential for fish passage in smaller streams. Larger culverts also require less maintenance to function properly.

The modified portion of the Mile 5 Road will be widened from approximately 10-feet to 20-feet. Existing culverts will be replaced due to their poor condition and the expanded roadway width. (It should be noted that the existing bridge at the stream crossing at station 69+75 will remain in place.) The first 12 culverts on Mile 5 Road, directly down slope of Gold Brook Road, were sized neglecting the detention time created by the upslope roadway, thus providing an oversized culvert which again enhances fish passage. Culverts on the Gold Brook Road are evenly spaced along the road, mitigating the effects of the roadway functioning as a drainage divide.

The proposed section of new access road from the Mile 5 Road at station 115+00 to the ridge road will be constructed to a 20-foot width. Culvert installation has been minimized, and only used where there is existing channelized flow. Rock sandwich roadway sections are placed in areas of fill, at wetland crossings, and where groundwater seepage is present. The location of these roadway sections with rock sandwiches are identified on the Project plans, but are subject to minor relocation during construction based on field observations.

Along the ridge, the crane paths (ridge road) that connect the WTG locations will be 34-feet wide to accommodate the large crane needed to erect the turbines. Once the turbines are in place and all construction is complete, these ridge roads will be reduced to a 20-foot width. Large portions of the WTG assembly areas will also be reclaimed. This runoff "credit" was not taken into consideration when sizing the ridge top culverts. A gravel surface was used to model the crane paths, the crane assembly areas and the rip rapped side slopes. Run-off from crane paths is conveyed through erosion control devices such as culverts with inlet and outlet protection, swales, ditch turnouts and plunge pools, where necessary. As with the access road to the ridgeline, the number of the smaller diameter (18") culverts may be reduced (or their locations modified) and additional rock sandwiches installed, based on in-field conditions and professional engineering judgment during construction.

Design calculations used for the sizing of culverts are included in the Stormwater Calculation Package located in Attachment B.14-3.

B.14.1.5 Conveyance Swales

Two types of conveyance swales are used for this Project: a trapezoidal cross section and a triangular cross section. The trapezoidal section is used along the Mile 5 Road to about station 142+00. This conveyance swale is used mostly on the upslope side of the road. A triangular swale section is used from station 142+00 to the end of the ridge access road, where ledge is anticipated. The conveyance swales are designed so they will not extend below the seasonal groundwater table. The conveyance swales lead to ditch turnouts then to plunge pools. As with the access roadway and crane road on the ridge, rock sandwiches are placed in areas of fill, at wetland crossings, and where groundwater seepage is present.

Design calculations used for the sizing of conveyance swales are included in the Stormwater Calculation Package located in Attachment B-14-3.

B.14.1.6 Phosphorus Control Plan

Per LURC Chapter 10.25.L requirements, non-residential development that creates a disturbed area of one or more acres within the direct watershed of a body of standing water 10 acres or greater in size requires a phosphorous control plan. Portions of the Kibby Expansion Project (turbine sites 7, 10, 11, a portion of 12, 13 and 14, and associated crane roads) are located within the Chain of Ponds Lake watershed. Turbine #15 and associated crane road are located in the Gold Brook watershed which flows to the North Branch Dead River and Flagstaff Lake. Therefore, these Project components must meet the phosphorus standards.

Calculations were performed to determine the quantity of phosphorous exported from these portions of the Project. As previously stated, the phosphorous calculations were based on the methodology used in Volume II of the 2008 Maine DEP Stormwater BMP Manual "Phosphorous

Control in Lake Watersheds: A Technical Guide to Evaluating New Development". To derive a total phosphorus budget, an allocation for each lake watershed was provided by MDEP to determine the Project's allowable phosphorus export threshold.

The phosphorous evaluation for the portion of the Project within the Chain of Ponds watershed was based on a parcel bounded by the top of the Sisk Mountain ridge downslope in a generally westerly direction to a boundary defined by the 2,700-foot contour (the development parcel). Most of this area lies within the limits of the P-MA subdistrict, which is bounded by the 2,700-foot contour and above.

The phosphorous evaluation for the portion of the Project within the Gold Brook/Flagstaff Lake watershed was based on a parcel bounded by the top of the Sisk Mountain ridge downslope in a generally southeasterly direction to a boundary defined by the 2,800-foot contour (the development parcel). All of this area lies within the limits of the P-MA subdistrict. Impervious area associated with the new access roads and turbine sites are considered in the phosphorus calculations. All other areas disturbed during construction are stabilized with erosion control mix and allowed to revert to pre-development conditions following construction.

At each turbine site, the impervious areas included in the potential phosphorus export calculations after stabilization of the site consist of a 0.27 acre gravel surface. The impervious area associated with the potential phosphorus export from the ridge roads is the 20-foot wide road that will be permanently maintained after site stabilization. The total length of access road included in the phosphorus calculations is approximately 9,000 feet in the Chain of Ponds watershed and 1,550 feet in the Gold Brook/Flagstaff Lake watershed.

The phosphorus standards restrict the amount of phosphorus exported from a development parcel based primarily on the current water quality and projected growth in the watershed. The allowable per-acre phosphorus allocation for the Chain of Ponds watershed, as provided by the MDEP, is 0.062 pounds per acre per year ("lbs/ac/yr"). The total tributary acreage of the development parcel in this watershed is approximately399.0 acres. Per the criteria established by MDEP, the 399.0 acres of developable land within the Chain of Ponds watershed can export approximately 24.74 pounds of phosphorus per year ("lbs/yr") without providing any controls. This value is reduced to a total of 7.36 lbs/yr after reduction for undevelopable areas such as wetlands exceeding one acre, and areas that have steep slopes exceeding 25 %. The Project's Maximum Permitted Phosphorus Export ("PPE") in the Chain of Ponds watershed is therefore 7.36 lbs/yr. This compares to the Project's potential calculated phosphorous export, based on the area of new impervious surfaces, roads and turbine pads in the Chain of Ponds watershed, of 7.29 lbs/year which is less than the PPE.

The allowable per-acre phosphorus allocation for the Flagstaff Lake watershed within Kibby Township, as provided by the MDEP, is 0.045 lbs/ac/yr. The total tributary acreage of the development parcel in this watershed is approximately 116.2 acres. Per the criteria established

by MDEP, the 116.2 acres of developable land within the Flagstaff Lake watershed can export approximately 5.23 lbs/yr of phosphorus without providing any controls. This value is reduced to a total of 1.88 lbs/yr after reduction for undevelopable areas such as wetlands exceeding one acre, and areas that have steep slopes exceeding 25%. The Project's PPE in the Gold/Brook/ Flagstaff lake watershed is therefore 1.88 lbs/yr. This compares to the Project's calculated phosphorous export, based on the area of new impervious surfaces, roads and turbine pads in the Flagstaff Lake watershed within Kibby Township, of 1.30 lbs/year which is less than the PPE without controls.

Additional details regarding phosphorous calculations are provided in the Stormwater Calculation Package located in Attachment B.14-3.

B.14.1.7 Stormwater Maintenance

TransCanada is responsible for the ongoing maintenance of new Project roads. The landowners will continue to maintain the major access roads at the site, i.e., Gold Brook Road, Wahl Road and Mile 5 Road. Following construction, the landowner will continue to control access to the site. The condition and functioning of the stormwater management features will be monitored for two years following construction. Any problems or concerns that arise will be corrected and monitored until long-term functionality can be assured.

B.14.1.8 Summary

In summary, the stormwater management design and controls as described in this report meet the LURC Chapter 10 requirements with respect to stormwater quantity control, phosphorous control, and erosion and sedimentation control practices. The proposed development is not expected to increase runoff when compared to the pre-development conditions. The curve numbers for each watershed studied are as follows:

Kibby Stream Watershed

Pre-Development Weighted CN = 72 Post-Development Weighted CN = 72

Gold Brook Watershed

Pre-Development Weighted CN = 73 Post-Development Weighted CN = 73

Chain of Ponds Watershed

Pre-Development Weighted CN = 75 Post-Development Weighted CN = 75

Substation Watershed

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Pre-Development Weighted CN = 71
Post-Development Weighted CN = 71
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The stormwater runoff calculations (Attachment B.14-3) indicate that the change in cover types in the developed site (the new access roads, crane (ridge) roads, WTG assembly pads, and substation) have no impact on the overall curve number when compared to the Pre-developed site within the watershed. In general, a higher curve number in the developed condition will usually mean an increase in runoff from the watershed. In each case, the resultant weighted curve numbers for the post-development site in each watershed matches the pre-development weighted curve number; therefore, there is no increase in runoff.

The Project meets its phosphorus budget for the Chain of Ponds and Gold Brook/Flagstaff Lake watersheds.

The Project will be constructed, and stabilized using erosion and sedimentation (E&S) Best Management Practices (BMPs) and receive routine maintenance to ensure their continued function. The site will be maintained to prevent or correct erosion problems. Additional details about specific E&S measures and the minimum contractor E&S Plan requirements are provided on the Permit Plan Set in Attachment B.13-1 and in Attachment B.14-2, respectively. Design measures have been identified that will be used as Project refinements are made during the final design stage and through the construction effort in response to field conditions.

ATTACHMENT B.14-1

Class L Soil Survey

CLASS L SOIL SURVEY

KIBBY EXPANSION WIND PROJECT

Prepared for:

TRANSCANADA



Prepared by:

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STATEWIDE SURVEYS, INC SOIL SCIENTISTS & LAND SURVEYORS 35 Eastman Road, Cape Elizabeth, ME 04107 Phone/Fax: 207-767-4200

November 4, 2009

Dana Valleau TRC 249 Western Avenue Augusta, ME 04330

Class L Soil Survey Kibby Expansion Wind Project Kibby & Chain of Ponds Townships, ME

Dana,

We observed test pits in the areas for the proposed Access Roads, Collector Lines, Substation and Wind Turbine Locations for the proposed Kibby Expansion Wind Power Project intermittently throughout the summer and fall months of 2009 (*June through October 2009*). The test pits were observed in the field to prepare a Class "L" Soil Survey for the proposed fifteen wind turbines, access roads and adjacent collector lines, and the new substation. We understand the soils information will be used for engineering the route alignment in addition to augmenting the permit application for the Kibby Expansion Wind Project with the Land Use Regulation Commission (*LURC*).

The survey limits were established in the field using the plans and GIS background files provided by the TRC GIS department. We observed 110 test pits and 18 borings along the proposed roadways, collector line, substation and turbine string in addition to the soil data collected from the wetlands delineated at the site. We also observed soil profiles from "cuts" into the "banks" along the existing woods roads where present. We documented the soil's morphology from the hand dug test pits and borings within the approximate proposed access road corridor. The field data was referenced to the current Maine State Soil Catena and determined that for mapping purposes the following soils should react similarly to the Abram, Brayton, Colonel, Dixfield, Enchanted, Lyman, Mahoosuc, Monarda, Peacham, Ricker, Searsport, Saddleback, Surplus, Tunbridge soil series including Udorthents. It should be noted that the soil profiles were observed to depths of refusal by hand implements and the reported refusal depths may be greater with mechanized excavations. In most profiles it is not feasible to observe soil profiles to

depths greater than 60" without excavating equipment. The collected data determined the underlying soils limitations for this Class "L" Soil Survey.

The soils ranged from "very shallow" (<10"), "shallow" (10" to <20"), "moderately deep" (20" to <40") and "deep" (40" to <60") depths over bedrock in the proposed project area. These soils also ranged in drainage classification from very poorly drained to excessively drained. Generally, the soils in the higher elevations were determined to have thixotropic and "cryic" soil conditions, whereas the soils in the lower elevations have frigid soil conditions without thixotropic characteristics. Many of the observed soils were shallow to assumed bedrock in the higher elevations with deeper soils in the lower elevations.

Typically, very shallow and shallow soils have many limiting factors for site development for projects with underground utilities, septic fields, lawns etc. However, shallow soils tend to provide suitable areas for wind power projects by impacting less soil in comparison to areas with deeper soils. The shallow soils underlying the proposed wind turbine sites will anchor the wind turbines to solid bedrock with less soil disturbance overall. Additionally, the shallower areas along the crest of the Sisk Mountain ridgelines will provide a natural solid road base with less soil disturbance. Any areas requiring blasting to alleviate slope gradients will produce materials that can be positioned in areas requiring fill materials for a desired local "cut and fill" balance. Less soil overburden should be more easily managed in comparison to deeper soils requiring more extensive soil excavations and overall soil impacts, drainage considerations and more topsoil storage space and management during project construction.

The proposed access road and much of the collector line will generally follow an existing woods road (5 *mile Road*) to elevation \pm 2500 feet. The collector lines will extend from each turbine location along the ridgeline access roads to a common "homerun" line that generally follows existing or proposed roads to the new substation. The existing Mile 5 Road is a drivable gravel road that begins at Mile 5 on the Gold Brook Road. The improved road appears to have been the main "haul" route for tree harvesting the area. The road continues for approximately two miles with both ditching and underlying culverts in place helping with overall conditions of the frequently used roadway. It has a deep base of compacted native soils along with an intricate ditching network along the "uphill" side. The roadway and ditching have all the culverts installed to the stream where the current road is "blocked" by boulders. After this point the culverts have been removed and the low-lying areas of the former culvert locations are currently functioning as "slope breaks" in many instances.

Natural conditions exist above 2700' in elevation and timber harvesting limits. A number of existing foot and moose trails continue up to the Sisk Mountain ridge tops at elevations up to \pm 3400'. The trails follow the "flatter" with gradual grades up to the ridge tops. Some wetland areas and/or streams will need to be avoided or crossed to

reach the ridges using the proposed access route. Many of the wetlands have had previous alterations including grading, filling and ditching efforts below the 2700' elevation. These areas will require control structures under the proposed route for access and to "convey" water for continued flow. The proposed alignment appears to be located in a suitable area as studied, however limitations such as wetlands, streams and steep slopes will need to be considered for the project.

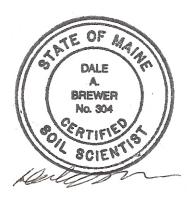
We visited the turbine sites and followed the proposed roadways and adjacent collector lines during this soil mapping effort. We located the existing roads, ditching, culvert locations, seeps, bedrock outcrops, slope breaks, wetland areas, borings and the soil test pit locations with Trimble® GEO-XH GPS units. Please see the following pages for more detailed soil information including the Soil Report, Soil Narratives, Soil Test Pit Logs and the attached Soil Map.

The Class L survey followed the proposed location of the remainder of the collector line, which is generally adjacent to the Gold Brook and Wahl Roads to the new substation. The proposed substation site is located off Wahl Road approximately 800 feet from the existing Kibby Substation.

Please feel free to contact us should questions arise or if further assistance is needed with the proposed Kibby Expansion Wind Project.

Respectfully submitted,

STATEWIDE SURVEYS, INC



Dale A. Brewer CSS #304

CLASS "L" SOIL NARRATIVE REPORT

KIBBY EXPANSION WIND PROJECT

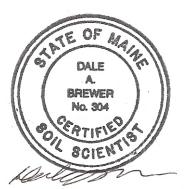
Date:	Test pits observed Summer/Fall 2009.
Base Map:	TRC Topographical Maps Two-foot contour intervals (2' <i>CI</i>) (<i>Provided Survey Plan</i>). Map Scale: 1 inch = 250 feet (1"=250').
Ground Control:	Test pits located by Trimble [®] GEO-XH GPS (sub-foot to sub-meter).

The Maine Association of Professional Soil Scientists (*MAPSS*) has adopted Standards for Class "L" Soil Surveys. This soil investigation has been prepared under remote and hand dug limitations as accepted for Class "L" Soil Surveys standards listed below.

Class L Soil Survey Minimum Standards

- 1. Map units are based on parent materials, slope, soil texture, soil depth to dense till or bedrock (*shallowest*) and soil wetness (*drainage class and/or oxyaquic conditions*) at the Class L High Intensity Map Unit size.
- 2. Scale of 1 inch = 100 feet (1''=100') or larger. 1''=250' for this project.
- 3. Ground Control and Test Pit locations accomplished using a Trimble GEO-XH GPS Unit, (*UTM 19 US Survey Feet*).
- 4. Base map with 2-foot contour intervals.

This Class L Soil Survey was prepared for the proposed Kibby Expansion Wind Project. The accompanying Soil Narratives (*Profile Descriptions*) and Soil Map were completed in general accordance with the standards adopted by the Maine Association of Soil Scientists and the Board of Certification of Geologists and Soil Scientists.



Dale A. Brewer, CSS #304

November 4, 2009

CLASS "L" SOIL CONDITIONS SUMMARY TABLE

KIBBY EXPANSION WIND PROJECT

FORM E

Page 1 of 4	FORM E				
SOIL CONDITIONS SUMMARY TABLE For SUBSURFACE INVESTIGATIONS AT DEP SITE LOCATION PROJECTS					
Project Name: KIBBY EXPANSION WIND	DEP Project #:				
Applicant Name: TRANSCANADA TRC ENVIRONMENTAL CORP	Consultant Name: STATEWIDE SURVEYS, INC DALE BREWER, C.S.S. #304				
Project Location <i>(municipality)</i> : KIBBY/ CHAIN OF PONDS TOWNSHIPS	CLASS L LINEAR SOIL SURVEY FOR WIND TURBINE EXPANSION				

TEST PIT	✓ or ×		Depths to (ch	ueck one): ✓ in	ches 🛛 cm	Ground
#	if at Field	• soil series name (C.S.S.) (as appropriate to the investigation)	Mottling Or Oxyaquic	Bedrock Assumed	Restrictive Layer	Surface (%)
TP-1	x	COLONEL "LIKE"	9″	>60″	20″	5-10
TP-2	x	DIXFIELD "LIKE"	>18″		18″	5-10
TP-3	x	DIXFIELD "LIKE"	>18″		18″	20-30
TP-4	x	BRAYTON "LIKE"	12″		14″	0-5
TP-5A	x	TUNBRIDGE VARIANT		20″		10-20
TP-5B	x	TUNBRIDGE VARIANT	12″	20″		10-20
TP-6	x	PEACHAM VARIANT	0″	14″	12″	0-5
TP-7	x	ABRAM		3″		5-10
TP-8	x	TUNBRIDGE "LIKE"	16″	21″		5-10
TP-9	x	PEACHHAM VARIANT	0″	9″		5-10
TP-10	x	PEACHHAM VARIANT	0″	12″	0″	5-10
TP-11	x	LYMAN VARIANT	8″	17″	9″	0-5
TP-12	x	NASKEAG "LIKE"	2″	12″	"	0-5
TP-3	x	DIXFIELD "LIKE"	>18″		18″	20-30
TP-4	x	BRAYTON "LIKE"	12″		14″	0-5
TP-5A	x	TUNBRIDGE VARIANT		20″		10-20
TP-5B	x	TUNBRIDGE VARIANT	12″	20″		10-20
TP-6	x	PEACHAM VARIANT	0″	14″	12″	0-5
TP-7	x	ABRAM		3″		5-10
TP-8	x	TUNBRIDGE "LIKE"	16″	21″		5-10
TP-9	x	PEACHHAM VARIANT	0″	9″		5-10
TP-10	x	PEACHHAM VARIANT	0″	12″	0″	5-10
TP-11	x	LYMAN VARIANT	8″	17″	9″	0-5
TP-12	x	NASKEAG "LIKE"	2″	12″	"	0-5

TP-13	x	DIXFIELD "LIKE"	>18″		18″	20-30
TP-20	x	SURPLUS	10″			15-30
TP-21	x	РЕАСНАМ	0″	32″		0-15
TP-22	x	SADDLEBACK		21″	19″	0-15
TP-23	x	WONSQUEAK	5″	7″		0-15
TP-24	x	WASKISH	0″			0-15
TP-25	x	SURPLUS	16″		16″	15-30
TP-26	x	SURPLUS	12″	43″	14″	0-15
TP-27	x	SURPLUS	14″		10″	15-30
TP-28	x	SURPLUS	8″		24″	15-30
TP-29	x	SURPLUS	6″	12″	6″	0-15
TP-30	x	SADDLEBACK	12″		7″	15-30
TP-31	x	RICKER	8″	14″	8″	0-15
TP-32	x	ENCHANTED		18″	12″	15-30
TP-33	x	SADDLEBACK		19″	12″	0-15
TP-34	x	WONSQUEAK	0″	28″		0-15
TP-35	x	ABRAM		5″		0-15
TP-36	x	DIXFIELD	20″		20″	15-30
TP-37	x	COLONEL	15″		15″	15-30
TP-38	x	DIXFIELD			18″	0-15
TP-39	x	COLONEL	8″		9″	0-15
TP-40	x	SADDLEBACK	6″	16″	10″	0-15
TP-41	x	SADDLEBACK	12″			30-40
TP-42	x	RICKER		2″	0″	30-40
TP-43	x	WONSQUEAK	0″	12″	0″	0-15
TP-44	x	SADDLEBACK		14″	9″	30-40
TP-45	x	RICKER		5″		0-15
TP-46	x	RICKER		0″		0-15
TP-47	x	WONSQUEAK	2″	10″	0″	0-15
TP-48	x	RICKER		5″	3″	0-15
TP-49	x	SADDLEBACK	8″	10″		0-15
TP-50	x	WONSQUEAK		8″	2″	0-15
TP-51	x	RICKER		1″		15-30
TP-52	x	SADDLEBACK	10″	13″	7″	0-15
TP-53	x	SADDLEBACK	12″	24″		0-15
TP-54	x	SADDLEBACK		24″		0-15
TP-55	x	SADDLEBACK		5″		15-30
TP-56	x	COLONEL	14″		18″	0-15
TP-57	x	COLONEL	10″	22″	17″	15-30
TP-58	x	COLONEL	15″		15″	15-30
TP-59	x	РЕАСНАМ	0″	12″	0″	0-15
TP-60	x	РЕАСНАМ	3″		6″	0-15
TP-61	x	RICKER		4″	0″	15-30
TP-62	x	WETLAND	0″			0-15

TP-63	x	WASKISH	0″	24″		0-15
TP-64	x	SADDLEBACK		17″	15″	0-15
TP-65	x	SADDLEBACK	12″	18″	9″	0-15
TP-66	x	ENCHANTED	17″	22″	16″	0-15
TP-67	x	SURPLUS	15″	22″	15″	30-40
TP-68	x	SURPLUS	13″	28″		0-15
TP-69	x	SURPLUS	8″		8″	0-15
TP-70	x	SADDLEBACK	14″	22″	14″	0-15
TP-71	x	SURPLUS	7″	18″		15-30
TP-72	x	SADDLEBACK		10″	0″	15-30
TP-73	x	SADDLEBACK	22″	26″		15-30
TP-74	x	WASKISH	0″	30″	24″	0-15
TP-75	x	SISK		20″		0-15
TP-76	x	SADDLEBACK	16″	20″	12″	0-15
TP-77	<i>x</i>	ENCHANTED	22"	-	22″	0-15
TP-78	x	RICKER		5″	0″	0-15
TP-79	x	WONSQUEAK	9″	16″		0-15
TP-80	x	SADDLEBACK		5″	4″	0-15
TP-81	<i>x</i>	RICKER		1″	_	0-15
TP-82	x	WASKISH	0″	34″		0-15
TP-83	<i>x</i>	SADDLEBACK		10"		30-40
TP-84	<i>x</i>	SADDLEBACK		17″		30-40
TP-85	x	COLONEL	8″		6″	0-15
TP-86	x	DIXFIELD	18″	56″	24″	0-15
TP-87	x	UDORTHENTS				0-15
TP-88	x	UDORTHENTS				0-15
TP-89	x	DIXFIELD	18″		18″	0-15
TP-90	x	BRAYTON	8″			0-15
TP-91	x	DIXFIELD	20″		22″	0-15
TP-92	x	LYMAN		12″		0-15
TP-93	x	BRAYTON	10″		10″	0-15
TP-94	x	TUNBRIDGE		20″	17″	15-30
TP-95	x	BRAYTON	14″		16″	0-15
TP-96	x	BRAYTON	8″		30″	0-15
TP-97	x	TUNBRIDGE		18″	10"	15-30
TP-98	x	PEACHAM	0″		6"	0-15
TP-99	x	TUNBRIDGE	12″	20″	12″	15-30
TP-100	x	MARLOW	22″		22″	0-15
TP-101	x	MARLOW			14″	0-15
TP-102	x	SEARSPORT	0″	15″		0-15
TP-103	x	TUNBRIDGE		20″		0-15
TP-104	x	DIXFIELD		26″	16″	0-15
TP-105	x	BRAYTON	16″		8″	0-15
TP-106	x	BRAYTON	8″		28″	0-15

TP-107	x	BRAYTON	12″			15-30
TP-108	x	BRAYTON	16″		16″	15-30
TP-109	x	BRAYTON	8″		8″	15-30
TP-110	x	SADDLEBACK		<20″		30-40+



Dale A. Brewer, C.S.S. #304

November 4, 2009

CLASS "L" SOIL LEGEND TABLE KIBBY EXPANSION WIND PROJECT

SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG
AbA	ABRAM	SL^1	0-15%	ED ²	D
AbB	ABRAM	SL^1	15-30%	ED ²	D
AbC	ABRAM	SL^1	30-40%	ED ²	D
AbD	ABRAM	SL^1	>40%	ED ²	D
СоА	COLONEL	FSL	0-15%	SWPD	Ċ
BeA	BEMIS	L^8	0-15%	PD ⁵	C
BeB	BEMIS	L^8	15-30%	PD ⁵	С
BrB	BRAYTON	FSL ³	15-30%	SWPD ⁴ /PD ⁵	С
BrC	BRAYTON	FSL ³	30-40%	SWPD ⁴ /PD ⁵	С
СоА	COLONEL	FSL	0-15%	SWPD	С
СоВ	COLONEL	FSL	15-30%	SWPD	С
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С
EnB	ENCHANTED	FSL	0-15%	WD ⁹	C/D
EnD	ENCHANTED	FSL	>40%	WD ⁹	C/D
LtB	LYMAN TUNE		15-30%	ED/WD ⁹	CD/C
LtC	LYMAN TUNE	BRIDGEFSL/L ⁸	30-40%	ED/WD ⁹	CD/C
LtD	LYMAN TUNE	BRIDGEFSL/L	15-30%	ED/WD	CD/C
MaB	MAHOOSUC	PEAT	15-30%	SWED ¹⁰	А
MaC	MAHOOSUC	PEAT	30-40%	SWED ¹⁰	А
PeA	PEACHAM	MUCK	0-15%	VPD ⁶	D
PeB	PEACHAM	MUCK	0-15%	VPD ⁶	D
RiA	RICKER	PEAT	0-15%	SWED ¹⁰	А
RiB	RICKER	PEAT	15-30%	SWED ¹⁰	А
RiC	RICKER	PEAT	30-40%	SWED ¹⁰	А
RiD	RICKER	PEAT	>40%	SWED ¹⁰	А
SeA	SEARSPORT	MUCK	0-15%	VPD ⁶	D
SaA	SADDLEBACK		0-15%	WD ⁹	C/D
SaB	SADDLEBACK		15-30%	WD ⁹	C/D
SaC	SADDLEBACK		15-30%	WD ⁹	C/D
SaD	SADDLEBACK		>40%	WD ⁹	C/D
SiC	SISK	FSL	15-30%	WD ⁹	C
SiD	SISK	FSL	30-40%	WD ⁹	C
SuA	SURPLUS	SL	0-15%	MWD/SWPE	
SuB	SURPLUS	SL	15-30%	MWD/SWPE	
SuC	SURPLUS	SL	30-40%	MWD/SWPE	
TuA TuP	TUNBRIDGE	FSL	0-15% 15.20%	WD	C C
TuB TuC	TUNBRIDGE	FSL	15-30%	WD	C C
TuC	TUNBRIDGE	FSL	30-40%	WD	С

TuD	TUNBRIDGE	FSL	>40%	WD	С
UdA	UDORTHENTS	VARIABLE	0-5%	VARIABLE	D
UdB	UDORTHENTS	VARIABLE	5-10%	VARIABLE	D

SL¹ is Sandy Loam. ED² is Excessively Drained. FSL³ is Fine Sandy Loam. SWPD⁴ is Somewhat Poorly Drained. PD⁵ is Poorly Drained. VPD⁶ is Very poorly Drained. MWD⁷ is Moderately Well Drained. L⁸ is Loam. WD⁹ is Well Drained. SWED¹⁰ is Somewhat Excessively Drained. SIL¹¹ is Silt Loam.

ABRAM (Frigid Lithic Udorthents)

SETTING

Parent Material:	Thin mantle of glacial till
Landform:	Bedrock controlled ridges
Position in Landscape:	Mountaintops, ridge tops, side slopes, shoulders, miscellaneous areas
Slope Gradient Ranges:	0 to 80 percent

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class: Excessively drained soils Typical Profile Description:

> Surface Layer: Thin organic mat Subsurface Layer: Pinkish gray sandy loam, 1 inch thick Subsoil Layer: Very dusky red and brown sandy loam, 3 inches thick Substratum: Bedrock is at 4 inches

Hydrologic Group:	Group D
Surface Run Off:	Rapid
Permeability:	Moderately rapid
Depth to Bedrock:	Very Shallow, 4 inches
Hazard to Flooding:	None

INCLUSIONS

(Within Mapping Unit)

Similar:	Saddleback
Contrasting:	Surplus, Histosols.

USE AND MANAGEMENT

Abram soils for Wind Power construction would likely need to "cut and fill" these areas to prepare the site for use. A limiting factor for building site development is the typical depth to bedrock (<20 *inches*) and slopes. However, shallow soils lend themselves to Wind Power projects with less soil impacts to access the underlying bedrock for use. Blasting or ripping of the underlying bedrock may be necessary to accommodate for slope gradients for site work and road alignments.

BEMIS (Aeric Cryaquepts)

TYPICAL SETTING

Parent Material:	Dense glacial till
Landform:	Smooth, concave high elevation valleys
Position in Landscape:	Lower to intermediate positions
Slope Gradient Ranges:	0 to 15 percent

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class: Typical Profile Description:	Poorly drained
Surface Layer:	Highly decomposed organic materials, 0 to 5 inches
Subsoil Layer:	Mottled dark grayish brown gravelly fine sandy loam, 5 to 13 inches
Substratum:	Mottled olive and olive brown gravelly loam to 65 inches
Hydrologic Group: Surface Run Off:	Group C Slow
Permeability:	Moderately slow to moderately rapid in the organic and slow in the substratum.
Depth to Bedrock:	Very deep, greater than 60 inches
Hazard to Flooding:	May flood occasionally on lowest fringes during spring and periods of excessive precipitation.

INCLUSIONS

(Within Mapping Unit)

Potential inclusion intermixed with the Surplus and/or Mahoosuc soils.

USE AND MANAGEMENT

Wind Power construction would likely need to mat these areas or complete the work during winter conditions. The limiting factor for building site development is wetness due to the presence of shallow water table throughout most of the year. The poorly drained Bemis soils frequently occur in wetland environments (*mapped*). Bemis soils were identified during this soil investigation, however they are expected in the concave sloping areas with the potential for seasonal wetness. Bemis soils may be deeper and underlying the Mahoosuc and/or the Surplus soils.

BRAYTON (Frigid Aeric Haplaquepts)

TYPICAL SETTING

Parent Material:	Dense glacial till.
Landform:	Level or sloping lake plains.
Position in Landscape:	Lower to intermediate positions.
Slope Gradient Ranges:	0 to 25%

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class:	Somewhat poorly and poorly drained soils.
Typical Profile:	Surface layer:Black organic matter, 0-4"Subsurface layer:Gray fine sandy loam, 4-15"Subsoil layer:Light olive brown sandy loam, 15 to 28"Substratum:Olive sandy loam to 28-65".
Hydrologic Group: Surface Run Off: Permeability:	Group C Slow Moderate or moderately slow in upper profile and very slow in dense substratum.
Depth to Bedrock: Hazard to Flooding:	Very deep, greater than 60". May flood occasionally.

INCLUSIONS

(Within Mapping Unit)

Similar:	Colonel.
Contrasting:	Dixfield, Lyman, Tunbridge.

USE AND MANAGEMENT

Wind Power construction would likely need to mat these areas or complete the work during winter conditions. A limiting factor for building site development is wetness due to the presence of a seasonal water table within 1.5 feet (1.5') of the soil surface for a significant portion of the year. Brayton soils are "hydric" and usually found in wetland habitats and may be subject to environmental regulations and environmental permits could be required to impact these areas.

BURNHAM (Typic Haplaquepts)

TYPICAL SETTING

Parent Material:	Glacial till
Landform:	Level flat areas
Position in Landscape:	Lower to intermediate positions
Slope Gradient Ranges:	0 to 3 percent

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class: Very poorly drained soils Typical Profile Description: Surface Layer: Very dark brown muck, 0 to 6 inches Subsurface Layer: Mottled gray loam 12 inches thick Subsoil layer: Mottled gray gravelly loam, 12 to 20 inches Substratum: Very firm olive gravelly loam to 20 to 60 inches

Hydrologic Group:	Group D
Surface Run Off:	Slow
Permeability:	Moderate or moderately slow in upper profile and very slow
	in dense substratum
Depth to Bedrock:	Very deep, greater than 60 inches
Hazard to Flooding:	Possible

INCLUSIONS

(Within Mapping Unit)

Similar:	None	
Contrasting:		

Brayton, Lyman, Monarda, Tunbridge

USE AND MANAGEMENT

Wind Power construction would likely need to mat these areas or complete the work during winter conditions. A limiting factor for building site development is wetness due to inundated or ponded areas on the surface for much of the year. Burnham soils are hydric and usually found in wetland environments and therefore may be subject to regulations. Wetland delineations are recommended prior to impacting these areas, as environmental permits could be required.

COLONEL (Frigid Aquic Haplorthods)

TYPICAL SETTING

Parent Material:	Compact glacial till.
Landform:	Lower toe slopes, gently sloping crests of broad till ridges.
Position in Landscape:	Lower to intermediate positions.
Slope Gradient Ranges:	0 to 35%

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class:	Somewhat poorly drained soils.
Typical Profile:	Surface layer: Very dark grayish brown fine sandy loam, 0-6"
	Subsoil layer: Dark brown and mottled dark yellowish brown fine sandy loam in the upper part and mottled olive brown gravelly fine sandy loam in the lower part, 11" thick.
	Substratum:Mottled olive gravelly fine sandyloam to 65".
Hydrologic Group:	Group C
Surface Run Off:	Medium
Permeability:	Moderate in the solum and moderately slow or slow in substratum.
Depth to Bedrock:	Deep, greater than 60".
Hazard to Flooding:	None

INCLUSIONS

(Within Mapping Unit)

Similar:	Brayton.
Contrasting:	Dixfield, Lyman, Tunbridge.

USE AND MANAGEMENT

Wind Power construction would likely need to mat these areas or complete the work during winter conditions. A limiting factor for building site development is wetness due to the presence of a water table within 1.5 feet (1.5') of the soil surface for a significant portion of the year. Colonel soils generally require ditching to control hydrology once road cuts are made. Colonel soils were identified in the lower elevations in somewhat poorly drained landscapes.

DIXFIELD (Frigid Typic Haplorthods)

TYPICAL SETTING

Parent Material:	Compact loamy glacial till.
Landform:	Glaciated uplands.
Position in Landscape:	Ridge tops and side slopes.
Slope Gradient Ranges:	0 to 50 percent

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class:	Moderately well drained.
Typical Profile Description:	Surface layer: Dark brown fine sandy loam, 0-6" Subsoil layer: The subsoil 15" thick is strong brown and dark yellowish brown fine sandy in the upper part and mottled light olive brown gravelly fine sandy loam in the lower part. Substratum: The substratum to 65" is very firm and mottled light olive brown gravelly fine sandy loam.
Hydrologic Group: Surface Run Off: Permeability: Depth to Bedrock: Hazard to Flooding:	Group C Medium Moderate in the solum and moderately slow or slow in substratum. Deep, greater than 60". None.

INCLUSIONS

(Within Mapping Unit)

Similar:	Marlow, Colonel.
Contrasting:	Lyman, Tunbridge.

USE AND MANAGEMENT

Wind Power construction is generally good with the Dixfield soils, however some areas may need control measures to handle the subsurface water movements. Seasonal high water tables and stoniness are principle limitations for Dixfield soils. Dixfield is a moderately well drained soil with dense basal till with variable depths to water moving across the dense firm restrictive subsoils.

ENCHANTED (*Mixed, Thixotropic over Loamy-Skeletal Humic Cryorthods*)

TYPICAL SETTING

Parent Material:	Glacial till
Landform:	Mountains
Position in Landscape:	Mountainside slopes above 2,300 feet
Slope Gradient Ranges:	5 to 80 percent

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class: Well drained soils Typical Profile Description: Surface Layer: Organic layer, 6 inches thick Subsurface Layer: Pinkish gray very stony very fine sandy loam, 3 inches thick Subsoil layer: Dark reddish brown and yellowish red channery fine sandy loam over mostly olive brown very gravelly sandy loam, 33 inches thick Substratum: Dark grayish brown extremely cobbly loamy sand to 46 inches. Bedrock is at 46 inches.

Hydrologic Group:	Group B
Surface Run Off:	Dependent upon slope gradient
Permeability:	Moderate or moderately rapid in the solum and rapid or very rapid in the substratum
Depth to Bedrock: Hazard to Flooding:	<u>+</u> 46 inches None

INCLUSIONS

(Within Mapping Unit)

Similar:	Surplus
Contrasting:	Saddleback

USE AND MANAGEMENT

Wind Power construction would likely need to "cut and fill" these areas to prepare the site for use. A limiting factor for building site development is the typical depth to bedrock (<46 *inches*) and slopes. Shallow soils lend themselves to Wind Power projects with less soil impacts to access the underlying bedrock for use. Blasting or ripping of the underlying bedrock may be necessary to accommodate for slope gradients, site work and road alignments.

LYMAN (Frigid Loamy Mixed Lithic Haplorthods)

TYPICAL SETTING

Parent Material:	Glacial till.
Landform:	Rocky hills and high plateaus.
Position in Landscape:	Side-slopes, shoulders, crests of ridges, eroded areas and
	nearly all landscapes.
Slope Gradient Ranges:	3 to 80%.

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class:	Somewhat excessively drained (SWED).
Typical Profile	Surface layer: Black loam, 0-2"
Description:	Subsurface layer: Reddish gray fine sandy loam, 2 to 4"
	Subsoil layer: Very dusky red 4 to 6", from 6" to 10" is dark red loam, and from 10" to 17" is dark brown loam. Substratum: Bedrock is at 17".
Hydrologic Group:	Group C/D.
Surface Run Off:	Slow to rapid, depending upon slope and bedrock exposure.
Permeability:	Moderately rapid.
Depth to Bedrock:	Shallow 8 to 20".
Hazard to Flooding:	None.

INCLUSIONS

(Within Mapping Unit)

Similar:	Abram, Tunbridge.
Contrasting:	Brayton, Dixfield.

USE AND MANAGEMENT

Wind Power construction would likely need to "cut and fill" these areas to prepare the site for use. A limiting factor for building site development is the typical depth to bedrock (<20 *inches*) and slopes. Shallow soils lend themselves to Wind Power projects with less soil impacts to access underlying bedrock for use. Blasting or ripping of the underlying bedrock may be necessary to accommodate for slope gradients, site work and road alignments.

MAHOOSUC (Typic Borofolists, Dysic)

TYPICAL SETTING

Parent Material:	Organic deposits over dense compact glacial till
Landform:	Mountain side slopes and valleys at the base of these areas
Position in Landscape	e: Variable
Slope Gradient Range	es: 8 to 80 percent

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class: Somewhat excessively drained		
Typical Profile	e Description:	
	Surface layer:	Dusky red and black undecomposed and partially decomposed organic materials, 0 to 8 inches
	Substratum:	Gravel, cobbles, stones and boulders with little organic materials to 65 inches
Hydrologic G	roup:	Group A
Surface Run C	Off:	Slow
Permeability:		Very rapid
Depth to Bedr	ock:	Very deep, greater than 60 inches

INCLUSIONS

None

(Within Mapping Unit)

Similar:	Rock outcrop
Contrasting:	Saddleback

Hazard to Flooding:

USE AND MANAGEMENT

Wind Power construction would likely need to blast these areas to prepare the site for use. Mahoosuc has limiting factors for building site development including steep slopes, large boulders, stones and seepage. Mahoosuc soils typically have an organic mat over loose boulders and stones. Wetter soils and/or "running" water may be underlying the boulders and stones.

MONARDA (Frigid Aeric Haplaquepts)

TYPICAL SETTING

Parent Material:	Dense glacial till.
Landform:	Glaciated uplands.
Position in Landscape:	Nearly level to strongly sloping.
Slope Gradient Ranges:	0 to 15%.

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class:	Poorly drained soils.	
Typical Profile	Surface layer: 4" organic mat	
Description:	Subsurface layer: Light brownish gray extremely gravelly silt loam 5" thick Subsoil layer: Mottled gray, gray and olive gravelly silt loam and very gravelly loam to 24" Substratum: The substratum to 65" is very dense mottled olive gravelly loam.	
Hydrologic Group:	Group D	
Surface Run Off:	Medium	
Permeability:	Moderate to moderately rapid in the subsurface, moderate to moderately slow in the lower part of the subsoil and substratum.	
Depth to Bedrock:	Deep, greater than 60".	
Hazard to Flooding:	None	

INCLUSIONS

(Within Mapping Unit)

Similar:	Brayton, Colonel
Contrasting:	Dixfield, Lyman, Tunbridge.

USE AND MANAGEMENT

Wind Power construction would likely need to mat these areas or complete the work during winter conditions. A perched fluctuating water table is at or near the surface for 7 to 9 months of the year. Monarda soils have many limitations for site development. Monarda soils are "hydric" and typically found in wetland environments.

PEACHAM (*Histic Humaquepts*)

SETTING

Organic depositions underlain by compact loamy glacial till.
Depressions and drainage ways on glaciated uplands.
Lowest positions and depressions on landform.
(A) 0-3% (B) 3-8%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Very poorly drained, with a perched water table within 0.5 feet of the soil surface from November through May.

Typical Profile Description:	Surface layer: Subsurface layer: Substratum:	Black organic material, 0-7" Olive gray loam, 7-10" Dark greenish gray loam, 10-65"
Hydrologic Group:	Group D	
Surface Run Off:	Moderately rapid	to rapid.
Permeability:	Moderate or mode	erately slow in upper layers, and slow or
	very slow in the de	ense substratum.
Depth to Bedrock:	Deep, greater than	a 40".
Hazard to Flooding:	None, although ma	ay be ponded during spring months
	time and periods o	f excessive precipitation.

INCLUSIONS

(Within Mapping Unit)

Similar:BraytonContrasting:Dixfield, Tunbridge.

USE AND MANAGEMENT

Wind Power construction would likely need to mat these areas or complete the work during winter conditions. The limiting factor for building site development is wetness due to the presence of a shallow water table within 0.5 feet of the soil surface for a significant portion of the year. Peacham soils have severe limitations for construction due to wetness and thick organic cap. Peacham soil is usually classified as wetlands, based on the combined consideration of hydrology, hydric conditions, and vegetation.

RICKER

(Lithic Borofolists, Dysic)

TYPICAL SETTING

Parent Material:Organic deposits over bedrockLandform:Mountains and hillsPosition in Landscape:VariableSlope Gradient Ranges:3 to 80 percent

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class:	s: Well to excessively drained	
Typical Profile I	Description:	
S	urface layer:	Peat and Mucky peat organic materials, 0 to 4 inches
Subsoil: 3" muck layer over a dark bluish gray channery silt loam 3" to 5"		
В	edrock is at 5	11
Hydrologic Gro	up:	Group A
Currence Dure Off	_	Denon dont un on alors

Group A
Dependent upon slope
Very rapid
Very shallow, less than 10 inches
None

INCLUSIONS

(Within Mapping Unit)

Similar:	Rock outcrop
Contrasting:	Saddleback

USE AND MANAGEMENT

Ricker soils have limiting factors for building site development including steep slopes in places with a thin layer of organic materials over very shallow depths to bedrock. However, these shallow soils lend themselves to Wind Power projects with less soil disturbances/impacts when accessing the underlying bedrock for use. Blasting or ripping of the underlying bedrock may be necessary to accommodate for slope gradients and road alignments.

SADDLEBACK

(Cryic Thixotropic Humic Lithic Cryorthods)

TYPICAL SETTING

Parent Material:Thin veneer of glacial tillLandform:Glaciated uplandsPosition in Landscape:Mountain ridges above 2,300 feetSlope Gradient Ranges:3 to 80 percent

COMPOSTION AND SOIL CHARACTERISTICS

Well	Well drained soils	
Description:		
Surface Layer:	Organic mat, 0 to 5 inches	
Subsurface Layer:	Dark grayish brown fine sandy loam, 1 inch	
Subsoil Layer:	Very dusky red, dark reddish brown and reddish	
-	brown fine sandy loam	
Substratum:	Bedrock is at 20 inches	
5	Description: urface Layer: ubsurface Layer: ubsoil Layer:	

Group C/D
Dependent upon slope gradient
Moderate
20 inches
None

INCLUSIONS

(Within Mapping Unit)

Similar: Contrasting: Enchanted Surplus, Rock outcrops

USE AND MANAGEMENT

Saddleback soils have limiting factors for building site development including steep slopes and shallow depths to bedrock. However these shallow soils are less limiting for Wind Power projects with less soil overburden to work with. Therefore, soil disturbances/impacts are less when accessing the shallow soils and underlying bedrock for use. Blasting or ripping of the underlying bedrock may be necessary to accommodate for slope gradients along the road alignments for a desired "cut and fill" balance.

SEARSPORT (*Histic Humaquepts*)

SETTING

Parent Material:	Organic depositions underlain by compact loamy glacial till.
Landform:	Terraces and outwash plains.
Position in Landscape:	Lowest positions and depressions on landform.
Slope Gradient Ranges:	(A) 0-3% (B) 3-8%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Very poorly drained, with a perched water table within 0.5 feet of the soil surface from November through May.

Typical Profile	Surface layer:	Dark gray mucky peat, 0-10"
Description:	Subsurface layer:	Dark gray loamy fine sand, 10-15"
1	Substratum:	Mottled dark gray loamy sand and gray sand, 15-65"

Hydrologic Group:	Group D
Surface Run Off:	Moderately rapid to rapid.
Permeability:	Moderate or moderately slow in upper layers, and slow or
	very slow in the dense substratum.
Depth to Bedrock:	Deep, greater than 40".
Hazard to Flooding:	None, although may be ponded during spring months
	time and periods of excessive precipitation.

INCLUSIONS

(Within Mapping Unit)

Similar: Brayton **Contrasting:** Dixfield, Tunbridge.

USE AND MANAGEMENT

Wind Power construction would likely need to mat these areas or complete the work during winter conditions. The limiting factor for building site development is wetness due to the presence of a shallow water table within 0.5 feet of the soil surface for a significant portion of the year. Searsport soils have severe limitations for construction due to wetness and thick organic cap. Searsport soil is usually classified as wetlands, based on the combined consideration of hydrology, hydric conditions, and vegetation.

SISK (Mixed Humic Cryorthods)

TYPICAL SETTING

Parent Material:Dense glacial tillLandform:Glaciated uplands and mountain ridgesPosition in Landscape:Mountain side slopes above 2,300 feetSlope Gradient Ranges:12 to 60 percent

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class:	Well drained soils
Typical Profile Description:	
Surface Layer:	Organic mat, 0 to 2 inches
Subsurface Lay	ver: Weak red silt loam, 1 inch thick
Subsoil Layer:	Dusky red, reddish brown silt loam in the upper
	part and yellowish brown and light olive brown
	gravelly loam in the lower part, 19 inches thick
Substratum:	Firm, brown gravelly fine sandy loam to 65 inches

Hydrologic Group:Group CSurface Run Off:Variable dependent upon slope gradientPermeability:Moderate in the solum and moderately slow or very slow in the
substratumDepth to Bedrock:Very deep, greater than 60 inchesHazard to Flooding:None

INCLUSIONS

(Within Mapping Unit)

Similar:Surplus, ChesuncookContrasting:Enchanted Saddleback

USE AND MANAGEMENT

Wind Power construction is generally good with the Sisk soils, however some areas may need control measures to handle the subsurface water movements. Seasonal high water tables and stoniness are principle limitations for Sisk soils. Sisk is a well drained soil with dense basal till with variable depths to water moving across the dense firm restrictive subsoils. Sisk soils have limiting factors for building site development including severe slopes, stoniness, frost action and slow percolation rates.

SURPLUS (*Mixed Typic Cryorthods, Thixotropic*)

TYPICAL SETTING

Parent Material:Dense glacial tillLandform:Glaciated uplandsPosition in Landscape:Mountainside slopes above 2,300 feetSlope Gradient Ranges:3 to 45 percent

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class: Moderately well and somewhat poorly drained soils Typical Profile Surface Layer: Organic mat, 0 to 7 inches Subsurface Layer: Brown sandy loam, 7 to 11 inches Subsoil Layer: Dark reddish brown fine sandy loam in the upper part and mottled yellowish red to brown gravelly fine sandy and sandy loam, 11 to 33 inches Substratum: Firm, mottled light olive brown sandy loam, 33 to 60"

Hydrologic Group:	Group C
Surface Run Off:	Dependent upon slope gradient
Permeability:	Moderate in the solum and moderately slow to very slow
	in the substratum
Depth to Bedrock:	Greater than 60 inches
Hazard to Flooding:	None

INCLUSIONS

(Within Mapping Unit)

Similar: Contrasting: Bemis Enchanted, Saddleback, Rock Outcrop, Wonsqueak, Waskish

USE AND MANAGEMENT

Wind Power construction would likely need to mat these areas or complete the work during winter conditions. The Surplus Series limiting factor for building site development is the depth to seasonal perched water table (<24 inches), frost action and strong slopes. The hand dug Test Pits E and F represent surplus soils. The poorly drained Bemis may be underlying or intermixed within the Mahoosuc and/or the Surplus soils. Bemis soils were not identified however seasonally wetter soils are expected in the concave slopes.

TUNBRIDGE (Frigid Typic Haplorthods)

TYPICAL SETTING

Parent Material:	Loamy glacial till.
Landform:	Glaciated uplands.
Position in Landscape:	Uppermost locations on landform, side slopes, shoulders, and crests of ridges.
Slope Gradient Ranges:	8-15%.

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class:	Well drained soils.	
Typical Profile	Surface layer:	Dark brown fine sandy loam, 0-2"
Description:	Subsurface layer: thick.	Grayish brown fine sandy loam, 1"
	5	reddish brown in the upper part and t loam in the lower part 11" thick.
		grayish brown gravelly fine sandy
	loam, 14" thick.	
Hydrologic Group:	Group C.	
Surface Run Off:	Slow to rapid, depe	nding upon slope gradient.
Permeability:	Moderate to moderate	ately rapid.
Depth to Bedrock:	0 to $40''$ to bedrock surface.	

INCLUSIONS

(Within Mapping Unit)

Similar:	
Contrasting:	

Hazard to Flooding:

Lyman. Abram, Dixfield.

None.

USE AND MANAGEMENT

Tunbridge soils have limiting factors for building site development including steep slopes and shallow depths to bedrock (<40"). However these shallow soils are less limiting for Wind Power projects with less soil overburden to work with. Therefore, soil disturbances/impacts are less when accessing the shallow soils and underlying bedrock for use. Blasting or ripping of the underlying bedrock may be necessary to accommodate for slope gradients along the road alignments for a desired "cut and fill" balance.

ROCK OUTCROP

(No Taxonomy)

TYPICAL SETTING

Parent Material:

Landform: Position in Landscape: Slope Gradient Ranges: Weathered/Unweathered volcanic, metamorphic, sedimentary or conglomerate materials. Variable, bedrock controlled ridges. Miscellaneous areas. 0-100%.

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class:

Excessively drained.

Typical Profile Description: Surface layer: Subsurface layer: Subsoil layer: Substratum: Occasional thin organic mat. None. None.

Hydrologic Group: Surface Run Off: Permeability: Depth to Bedrock: Hazard to Flooding:

Group D. Very rapid. Moderately rapid. Very Shallow, < 4". None.

INCLUSIONS

(Within Mapping Unit)

Similar: Contrasting: Lyman. Tunbridge.

USE AND MANAGEMENT

Rock outcrops are limiting factors for building site development with steep slopes and shallow depth to bedrock (<4"). Blasting or ripping of the bedrock is necessary for deep excavation. Rock outcrops are shown as symbols on the soil map.

UDORTHENTS (UdA), (UdB), (UdD)

(Variable composition, no taxonomy given)

TYPICAL SETTING

Parent Material:	Variable
Landform:	Variable
Position in Landscape:	Variable
Slope Gradient Ranges:	Variable

Variable, typically glacialfluvial sands and gravel. Variable, used in most landscapes. Variable. Variable.

COMPOSTION AND SOIL CHARACTERISTICS

Drainage Class:	Excessively drained to well drained soils.
Typical Profile:	Surface layer: Variable, usually sands, gravel and cobbles.
Hydrologic Group: Surface Run Off: Permeability: Depth to Bedrock:	Variable, C/D with permeable underlying soils. Variable, dependent upon the fill composition and slope. Variable, dependent upon the fill composition and slope. Variable.
Hazard to Flooding:	None.
	INCLUCION C

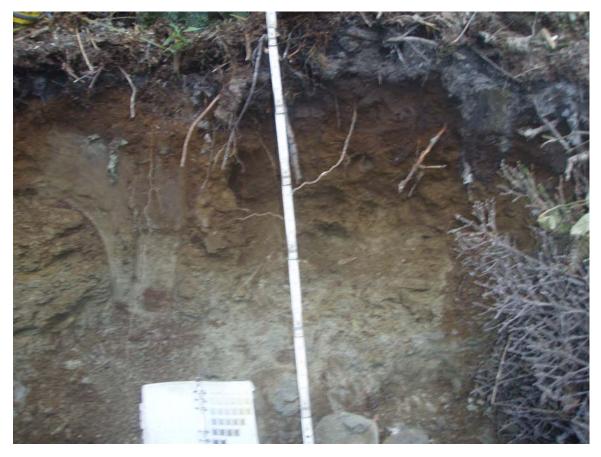
INCLUSIONS

(Within Mapping Unit)

Similar: Contrasting: None. Colonel, Lyman, Tunbridge.

USE AND MANAGEMENT

Environmental permits may be required to "fill" land areas. Udorthents are fill materials located within and around the existing Livermore Falls Substation perimeter. The fill materials observed consisted of compacted sands, gravels and crushed stone materials



Photograph One. TEST PIT 77 – Enchanted soils. Photograph taken 096/22/09.



Photograph Two. View of the landscape with the existing Kibby Mountain Wind Project in the background. Taken from the cut-over area at the end of the 5 Mile Road. This area is has Surplus and Bemis soils. Photograph taken 08/11/09.



Photograph Three. View of the Sisk Mountain ridgeline looking southerly from near Test Pit 61. Photograph taken 09/02/2009.



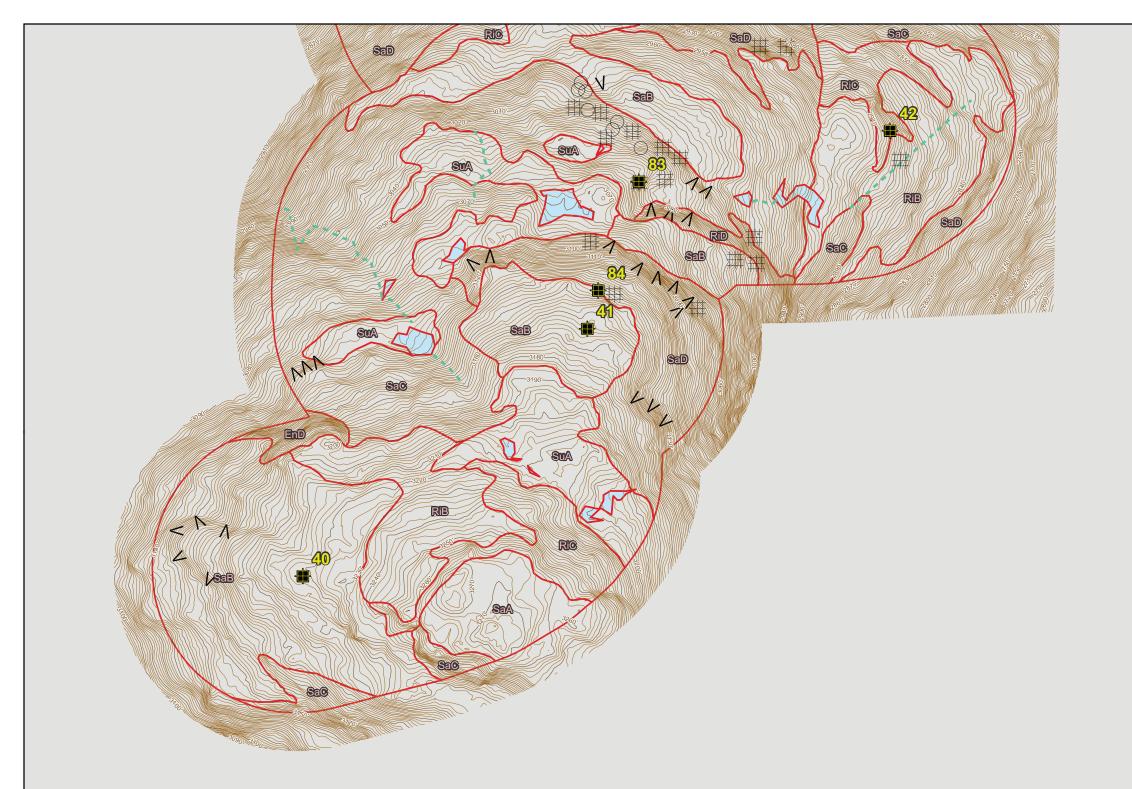
Photograph Four. TEST PIT 80 – shallow Saddleback soils. Photograph taken on 09/22/2009.



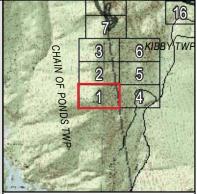
Photograph Five. A photograph of a common bedrock exposure. Photograph taken 09/17/09.



Photograph Six. A close up of cryic soils with thixotropic conditions. These soils have a thick elluvial layer over spodic horizons with thixotropic properties over dense basal till and bedrock.



CLASS "L"	SOIL LEGENE) TABLE																	Class "L" Soil S
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTURE		SLOPE	DRAINAG	E HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGI	E HSG	
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTE	D FSL	_	0-15%	WD ⁹	C/D	SaA	SADDLEBA	.CK FSL	0-15%	WD ⁹	C/D	1. This Class "L" Soil Survey was o
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTE	D FSL	_	>40%	WD ⁹	C/D	SaB	SADDLEBA	.CK FSL	15-30%	WD ⁹	C/D	wind turbine expansion along the
AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TUN	NBRIDGEFSI	L/L ⁸	15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBA	.CK FSL	15-30%	WD ⁹	C/D	The soil survey was designed to p limitations along the proposed acc
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TUN	NBRIDGEFSI	L/L ⁸	30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBA	.CK FSL	>40%	WD ⁹	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TUN	NBRIDGEFSI	L/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	Ċ	2. The Class "L" Soil Survey is bas
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSUC	C PEA	AT	15-30%	SWED10	Α	SiD	SISK	FSL	30-40%	WD ⁹	С	soil survey recently adopted by the Professional Soil Scientists (2009).
BeB	BEMIS	L^8	15-30%	PD ⁵	С	MaC	MAHOOSUC	C PEA	AT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWP	DC	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	MU	JCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWP	DC	3. The map units shown are soil se
BrC	BRAYTON	FSL ³	30-40%	SWPD ⁴ /PD ⁵	С	PeB	PEACHAM	MU	JCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWP	DC	the typical pedon description and
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEA	AT	0-15%	SWED10	А	TuA	TUNBRIDG	E FSL	0-15%	WD	С	intensive surveys. The soil units w impacts, landscape position, topo
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEA	AT	15-30%	SWED10	А	TuB	TUNBRIDG	E FSL	15-30%	WD	С	depth to seasonal water table, dep
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С	RiC	RICKER	PEA	AT	30-40%	SWED10	А	TuC	TUNBRIDG	E FSL	30-40%	WD	С	layers and soil textures as determi
DxB	DIXFIELD	FSL	15-30%	MWD7	С	RiD	RICKER	PEA	AT	>40%	SWED10	А	TuD	TUNBRIDG	E FSL	>40%	WD	С	4. All test pits and borings were ob 5. All test pits and borings were loo
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	MU	JCK	0-15%	VPD ⁶	D	UdA	UDORTHE	NTS VARIABLE	0-5%	VARIABLE	D	GPS units.
													UdB	UDORTHE	NTS VARIABLE	5-10%	VARIABLE	D	



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*	Proposed Turbine Locations
	Test Pit
##	Bedrock
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AbA	Soils
	2' Contour within survey area
	Streams
	Drainage
	Wetlands
	Turbine Pad
	Substation Area
	Project Access
	Collector Corridor
	Proposed 34.5kV Collector Transmission Line
•	Proposed Collector Structure Locations
—	Existing Transmission Line
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Sour	ces: Maine OGIS, USGS and TRC
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	Soils Map
	Page 1
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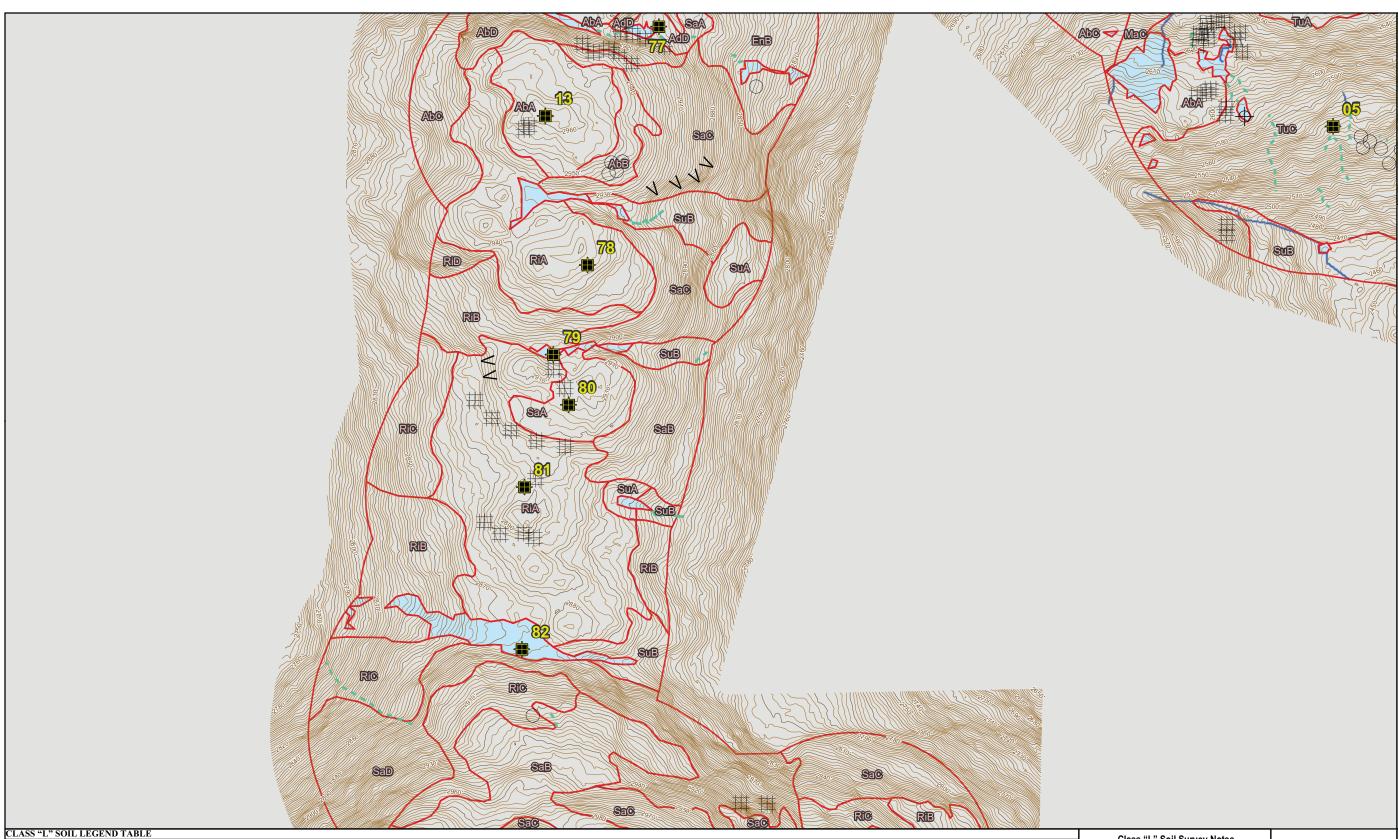
l Survey Notes

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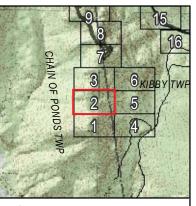
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soil series that closely resemble and may vary with more nits were based on: previous topography, slope, stoniness, e, depth to bedrock, restrictive stermined by observations. ere observed using hand tools. ere located with Trimble Geo-XH





CLASS "L" S	SOIL LEGEND	TABLE																	Class "L" Soil S
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTUR	RE	SLOPE	DRAINAGI	E HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAG	E HSG	
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTE	ED F	SL	0-15%	WD ⁹	C/D	SaA	SADDLEBA	CK FSL	0-15%	WD ⁹	C/D	1. This Class "L" Soil Survey was
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTE	ED F	SL	>40%	WD ⁹	C/D	SaB	SADDLEBA	CK FSL	15-30%	WD ⁹	C/D	wind turbine expansion along the
AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TU	NBRIDGEF	FSL/L ⁸	15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBA	CK FSL	15-30%	WD ⁹	C/D	The soil survey was designed to p limitations along the proposed ac
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TU	NBRIDGEF	FSL/L ⁸	30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBA	CK FSL	>40%	WD ⁹	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TU	NBRIDGEF	FSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	С	2. The Class "L" Soil Survey is ba
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSU	C P	EAT	15-30%	SWED10	Α	SiD	SISK	FSL	30-40%	WD ⁹	С	soil survey recently adopted by th Professional Soil Scientists (2009
BeB	BEMIS	L^8	15-30%	PD ⁵	С	MaC	MAHOOSU	C P	EAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWP	D C	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	Ν	/UCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWP	'D C	3. The map units shown are soil s
BrC	BRAYTON	FSL ³	30-40%	SWPD4/PD5	С	PeB	PEACHAM	Ν	/UCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWP	'D C	the typical pedon description and
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	Р	EAT	0-15%	SWED10	А	TuA	TUNBRIDG	E FSL	0-15%	WD	С	intensive surveys. The soil units v impacts, landscape position, topo
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	Р	EAT	15-30%	SWED10	А	TuB	TUNBRIDG	E FSL	15-30%	WD	С	depth to seasonal water table, dep
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С	RiC	RICKER	Р	EAT	30-40%	SWED10	А	TuC	TUNBRIDG	E FSL	30-40%	WD	С	layers and soil textures as determ
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С	RiD	RICKER	Р	EAT	>40%	SWED10	А	TuD	TUNBRIDG	E FSL	>40%	WD	С	4. All test pits and borings were o 5. All test pits and borings were lo
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	ΓΝ	/UCK	0-15%	VPD ⁶	D	UdA	UDORTHE	NTS VARIABLE	0-5%	VARIABLE	D	GPS units.
													UdB	UDORTHE	NTS VARIABLE	5-10%	VARIABLE	D	



- ***** Proposed Turbine Locations Test Pit
- 拱 Bedrock
- \oplus Boring
- \bigcirc Bouldery
- V Steep
- ABA Soils
- 2' Contour within survey area
- Streams _____
- -Drainage
- Wetlands

- Turbine Pad
 - Substation Area
 - Project Access
 - Collector Corridor
 - Proposed 34.5kV Collector Transmission Line
- Proposed Collector ٠ Structure Locations
- Existing Transmission Line
- Project Limits



Sources: Maine OGIS, USGS and TRC

Kibby Expansion Wind Power Project

Soils Map

Page 2

"L" Soil Survey Notes

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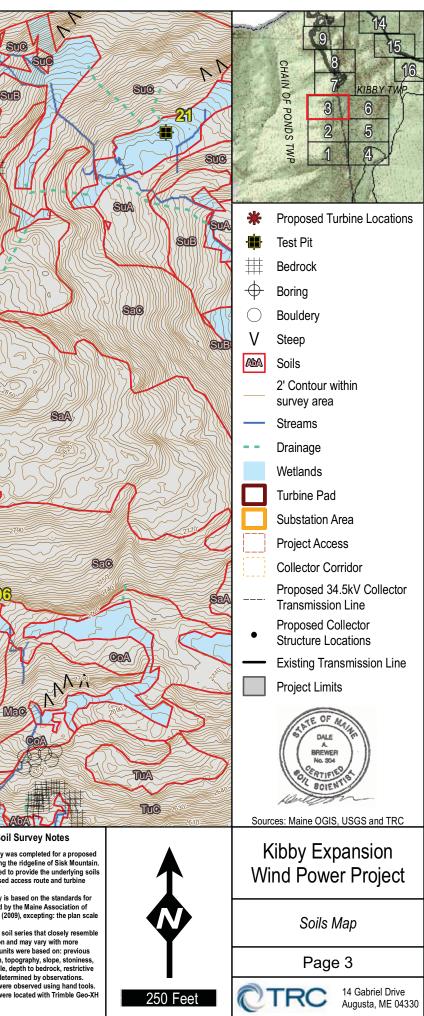
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CLASS "L" SOIL LEGEND TABLE	Abg	RTA ADA Sac	Sec.			HSC Class "L" So

Class "L" Soil																D IMBEL	SOIL LEGEN	CLINDS L
	E HSG	DRAINAG	SLOPE	TURE	SERIES TE	SYMBOL	E HSG	DRAINAG	SLOPE	TEXTURE	SERIES	SYMBOL	E HSG	DRAINAGI	SLOPE	TEXTURE	SERIES	SYMBOL
1. This Class "L" Soil Survey wa		WD ⁹	0-15%	FSL	SADDLEBACK	SaA	C/D	WD ⁹	0-15%	TED FSL	ENCHAN	EnB	D	ED ²	0-15%	SL^1	ABRAM	AbA
wind turbine expansion along th	C/D	WD ⁹	15-30%	FSL	SADDLEBACK	SaB	C/D	WD ⁹	>40%	TED FSL	ENCHAN	EnD	D	ED ²	15-30%	SL^1	ABRAM	AbB
The soil survey was designed to limitations along the proposed a	C/D	WD ⁹	15-30%	FSL	SADDLEBACK	SaC	CD/C	ED/WD ⁹	15-30%	JNBRIDGEFSL/L ⁸	LYMAN T	LtB	D	ED ²	30-40%	SL^1	ABRAM	AbC
locations.		WD ⁹	>40%	FSL	SADDLEBACK	SaD	CD/C	ED/WD ⁹	30-40%	UNBRIDGEFSL/L ⁸	LYMAN T	LtC	D	ED ²	>40%	SL^1	ABRAM	AbD
2. The Class "L" Soil Survey is b		WD ⁹	15-30%	FSL	SISK	SiC	CD/C	ED/WD	15-30%	JNBRIDGEFSL/L	LYMAN T	LtD	С	SWPD	0-15%	. FSL	COLONEL	СоА
soil survey recently adopted by Professional Soil Scientists (200		WD ⁹	30-40%	FSL	SISK	SiD	Α	SWED10	15-30%	JC PEAT	MAHOOS	MaB	С	PD ⁵	0-15%	L^8	BEMIS	BeA
of 1" = 250'.	PD C	MWD/SWF	0-15%	SL	SURPLUS	SuA	А	SWED ¹⁰	30-40%	JC PEAT	MAHOOS	MaC	С	PD ⁵	15-30%	L^8	BEMIS	BeB
3. The map units shown are soil		MWD/SWF	15-30%	SL	SURPLUS	SuB	D	VPD ⁶	0-15%	1 MUCK	PEACHAN	PeA	05 C	SWPD4/PD5	15-30%	FSL ³	BRAYTON	BrB
the typical pedon description an	PD C	MWD/SWF	30-40%	SL	SURPLUS	SuC	D	VPD ⁶	0-15%	1 MUCK	PEACHAN	PeB	05 C	SWPD4/PD5	30-40%	FSL ³	BRAYTON	BrC
intensive surveys. The soil units impacts, landscape position, top	С	WD	0-15%	FSL	TUNBRIDGE	TuA	Α	SWED10	0-15%	PEAT	RICKER	RiA	С	SWPD	0-15%	. FSL	COLONEL	СоА
depth to seasonal water table, de	С	WD	15-30%	FSL	TUNBRIDGE	TuB	А	SWED ¹⁰	15-30%	PEAT	RICKER	RiB	С	SWPD	15-30%	. FSL	COLONEL	СоВ
layers and soil textures as deter	С	WD	30-40%	FSL	TUNBRIDGE	TuC	А	SWED10	30-40%	PEAT	RICKER	RiC	С	MWD ⁷	0-15%	FSL	DIXFIELD	DxA
4. All test pits and borings were 5. All test pits and borings were	С	WD	>40%	FSL	TUNBRIDGE	TuD	Α	SWED10	>40%	PEAT	RICKER	RiD	С	MWD7	15-30%	FSL	DIXFIELD	DxB
GPS units.	D	VARIABLE	0-5%	VARIABLE	UDORTHENTS	UdA	D	VPD ⁶	0-15%	AT MUCK	SEARSPOI	SeA	С	MWD ⁷	30-40%	FSL	DIXFIELD	DxC
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AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TUNI	BRIDGEFSL/L ⁸	15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	The soil survey was designed to p limitations along the proposed acc
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СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TUNI	BRIDGEFSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	С	2. The Class "L" Soil Survey is bas
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СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEAT	15-30%	SWED ¹⁰	А	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, dep
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С	RiC	RICKER	PEAT	30-40%	SWED10	А	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as determ
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С	RiD	RICKER	PEAT	>40%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were of 5. All test pits and borings were lo
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	MUCK	0-15%	VPD ⁶	D	UdA	UDORTHENTS	VARIABLE	0-5%	VARIABLE	D	GPS units.
												UdB	UDORTHENTS	VARIABLE	5-10%	VARIABLE	D	

DXG

Niler2:5 Rd

DXC

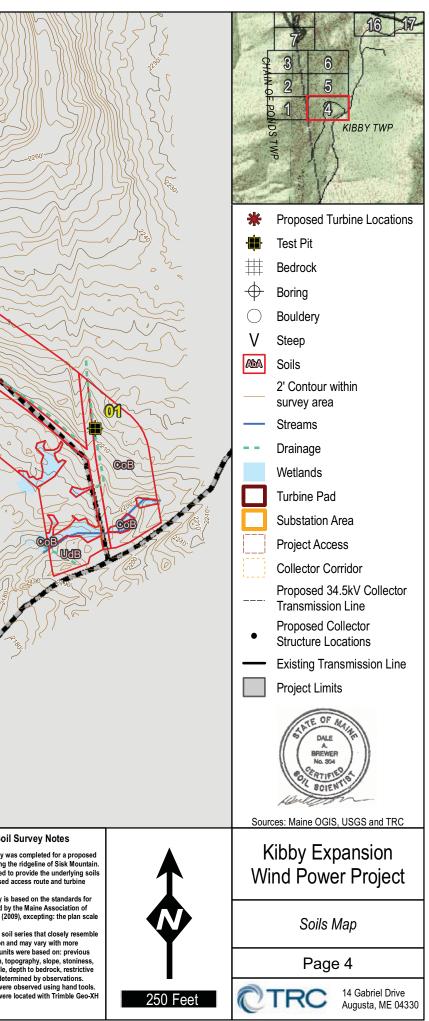
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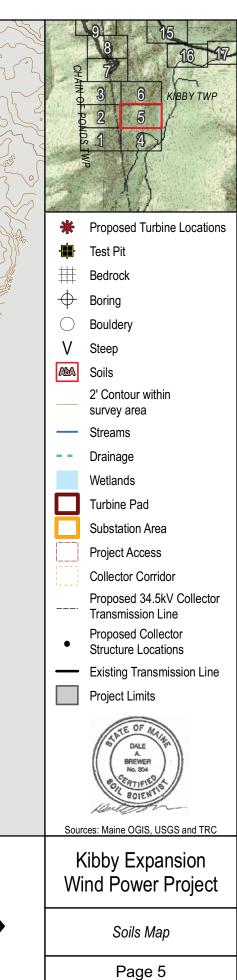
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CLASS "L" SOIL LEGEND TABLE													Class "L" Soil					
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAG	E HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	E HSG	
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTE	D FSL	0-15%	WD ⁹	C/D	SaA	SADDLEBACH	K FSL	0-15%	WD ⁹	C/D	
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTE	D FSL	>40%	WD ⁹	C/D	SaB	SADDLEBACH	K FSL	15-30%	WD ⁹	C/D	wind turbine expansion along th
AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TUN	NBRIDGEFSL/L8	15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBACH	K FSL	15-30%	WD ⁹	C/D	The soil survey was designed to limitations along the proposed a
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TUN	NBRIDGEFSL/L8	30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBACH	K FSL	>40%	WD ⁹	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TUN	NBRIDGEFSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	C	2. The Class "L" Soil Survey is I
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSUC	C PEAT	15-30%	SWED10	Α	SiD	SISK	FSL	30-40%	WD ⁹	С	soil survey recently adopted by Professional Soil Scientists (200
BeB	BEMIS	L^8	15-30%	PD⁵	С	MaC	MAHOOSUC	C PEAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWP	D C	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWP	D C	3. The map units shown are soil
BrC	BRAYTON	FSL ³	30-40%	SWPD4/PD5	С	PeB	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWP	D C	the typical pedon description ar
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEAT	0-15%	SWED10	А	TuA	TUNBRIDGE	FSL	0-15%	WD	С	intensive surveys. The soil units impacts, landscape position, to
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEAT	15-30%	SWED10	А	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, d
DxA	DIXFIELD	FSL	0-15%	MWD7	С	RiC	RICKER	PEAT	30-40%	SWED10	Α	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as deter
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С	RiD	RICKER	PEAT	>40%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were 5. All test pits and borings were
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	MUCK	0-15%	VPD ⁶	D	UdA	UDORTHENT	S VARIABLE	0-5%	VARIABLE	D	GPS units.
												UdB	UDORTHENT	S VARIABLE	5-10%	VARIABLE	D	



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Class "L" SOIL LECEND TABLE	Class "L" Soil

CLASS "L"	SOIL LEGENL) TADLE																Class "L" Soil
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAG	E HSG	SYMBOL	SERIES 1	EXTURE	SLOPE	DRAINAGE	HSG	
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTED) FSL	0-15%	WD ⁹	C/D	SaA	SADDLEBACK	FSL	0-15%	WD9	C/D	1. This Class "L" Soil Survey wa
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTED) FSL	>40%	WD ⁹	C/D	SaB	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	wind turbine expansion along the
AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TUN	BRIDGEFSL/L ⁸	15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	The soil survey was designed to limitations along the proposed a
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TUN	BRIDGEFSL/L ⁸	30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBACK	FSL	>40%	WD9	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TUN	BRIDGEFSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD9	C	2. The Class "L" Soil Survey is I
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSUC	PEAT	15-30%	SWED10	Α	SiD	SISK	FSL	30-40%	WD9	С	soil survey recently adopted by Professional Soil Scientists (200
BeB	BEMIS	L^8	15-30%	PD⁵	С	MaC	MAHOOSUC	PEAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWPE	D C	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWPE) C	3. The map units shown are soil
BrC	BRAYTON	FSL ³	30-40%	SWPD4/PD5	С	PeB	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWPE) C	the typical pedon description an
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEAT	0-15%	SWED10	А	TuA	TUNBRIDGE	FSL	0-15%	WD	С	intensive surveys. The soil units impacts, landscape position, to
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEAT	15-30%	SWED10	А	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, d
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С	RiC	RICKER	PEAT	30-40%	SWED10	А	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as deter
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С	RiD	RICKER	PEAT	>40%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were 5. All test pits and borings were
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	MUCK	0-15%	VPD ⁶	D	UdA	UDORTHENTS	VARIABLE	0-5%	VARIABLE	D	GPS units.
												UdB	UDORTHENTS	VARIABLE	5-10%	VARIABLE	D	



		14
	*	Proposed Turbine Locations
	÷	Test Pit
	##	Bedrock
	\oplus	Boring
	\bigcirc	Bouldery
	V	Steep
<u>S</u>	Aba	Soils
		2' Contour within survey area
2340	—	Streams
[7]}		Drainage
		Wetlands
		Turbine Pad
, , , , , , , , , , , , , , , , , , ,		Substation Area
		Project Access
		Collector Corridor
		Proposed 34.5kV Collector Transmission Line
	•	Proposed Collector Structure Locations
}}{({<	—	Existing Transmission Line
		Project Limits
		ALL SOF MANY
0	Sourc	ces: Maine OGIS, USGS and TRC
		ibby Expansion nd Power Project
		Soils Map
		Page 6
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oil Survey Notes

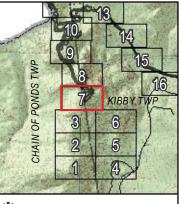
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CLASS "L" SOIL LEGEND TABLE														Class "L" Soil S				
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	E HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINA	GE HSG	SYMBOL	SERIES 7	EXTURE	SLOPE	DRAINAG	E HSG	
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTE	ED FSL	0-15%	WD ⁹	C/D	SaA	SADDLEBACK	FSL	0-15%	WD ⁹	C/D	1. This Class "L" Soil Survey was
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTE	ED FSL	>40%	WD ⁹	C/D	SaB	SADDLEBACK	FSL	15-30%	WD9	C/D	wind turbine expansion along the
AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TU	NBRIDGEFSL/L	8 15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	The soil survey was designed to p limitations along the proposed ac
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TU	NBRIDGEFSL/L	8 30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBACK	FSL	>40%	WD9	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TU	NBRIDGEFSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD9	С	2. The Class "L" Soil Survey is ba
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSU	C PEAT	15-30%	SWED10	Α	SiD	SISK	FSL	30-40%	WD9	С	soil survey recently adopted by th Professional Soil Scientists (2009
BeB	BEMIS	L^8	15-30%	PD⁵	С	MaC	MAHOOSU	C PEAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWI	PD C	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	MUCH	C 0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWI	PD C	3. The map units shown are soil s
BrC	BRAYTON	FSL ³	30-40%	SWPD4/PD5	С	PeB	PEACHAM	MUCH	C 0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWI	PD C	the typical pedon description and
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEAT	0-15%	SWED10	А	TuA	TUNBRIDGE	FSL	0-15%	WD	С	intensive surveys. The soil units impacts, landscape position, topo
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEAT	15-30%	SWED10	А	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, de
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С	RiC	RICKER	PEAT	30-40%	SWED10	А	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as determ
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С	RiD	RICKER	PEAT	>40%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were o 5. All test pits and borings were lo
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	r MUCH	C 0-15%	VPD ⁶	D	UdA	UDORTHENTS	VARIABLE	0-5%	VARIABLE	D	GPS units.
												UdB	UDORTHENTS	VARIABLE	5-10%	VARIABLE	D	



- * Proposed Turbine Locations Test Pit
- 拱 Bedrock
- \oplus Boring
- \bigcirc Bouldery
- V Steep
- ABA Soils
 - 2' Contour within survey area
 - Streams
- Drainage
- Wetlands
- Turbine Pad
 - Substation Area
 - Project Access
 - Collector Corridor
 - Proposed 34.5kV Collector Transmission Line
- Proposed Collector ۲ Structure Locations
- Existing Transmission Line
- Project Limits



Sources: Maine OGIS, USGS and TRC

Kibby Expansion Wind Power Project

Soils Map

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oil Survey Notes

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y was completed for a proposed g the ridgeline of Sisk Mountain. d to provide the underlying soils ed access route and turbine

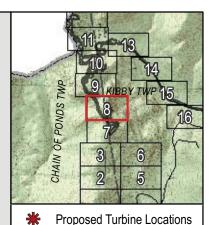
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	SOIL LEGENE					01 0 () 0 0 ()	000000											Class "L" Soil S
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGI	E HSG	SYMBOL	SERIES 1	FEXTURE	SLOPE	DRAINAGE	HSG	
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTE	ED FSL	0-15%	WD ⁹	C/D	SaA	SADDLEBACK	FSL	0-15%	WD ⁹	C/D	
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTE	ED FSL	>40%	WD ⁹	C/D	SaB	SADDLEBACK	FSL	15-30%	WD9	C/D	wind turbine expansion along the
АЬС	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TU	NBRIDGEFSL/L	⁸ 15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	The soil survey was designed to limitations along the proposed as
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TU	NBRIDGEFSL/L	8 30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBACK	FSL	>40%	WD9	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TU	NBRIDGEFSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	С	2. The Class "L" Soil Survey is b
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSU	C PEAT	15-30%	SWED10	А	SiD	SISK	FSL	30-40%	WD9	С	soil survey recently adopted by t Professional Soil Scientists (200
BeB	BEMIS	L^8	15-30%	PD ⁵	С	MaC	MAHOOSU	C PEAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWPI	DC	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWPI	DC	3. The map units shown are soil
BrC	BRAYTON	FSL ³	30-40%	SWPD4/PD5	С	PeB	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWPI	DC	the typical pedon description and intensive surveys. The soil units
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEAT	0-15%	SWED10	А	TuA	TUNBRIDGE	FSL	0-15%	WD	С	impacts, landscape position, top
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEAT	15-30%	SWED ¹⁰	А	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, de
DxA	DIXFIELD	FSL	0-15%	MWD7	С	RiC	RICKER	PEAT	30-40%	SWED10	А	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as determ
DxB	DIXFIELD	FSL	15-30%	MWD7	С	RiD	RICKER	PEAT	>40%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were of 5. All test pits and borings were I
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	r MUCk	0-15%	VPD ⁶	D	UdA	UDORTHENTS	5 VARIABLE	0-5%	VARIABLE	D	GPS units.
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		Froposed furbine Location
		Test Pit
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	\oplus	Boring
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- Collector Corridor
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Sources: Maine OGIS, USGS and TRC

Kibby Expansion Wind Power Project

Soils Map

Page 8

TRC 14 Gabriel Drive Augusta, ME 04330

oil Survey Notes

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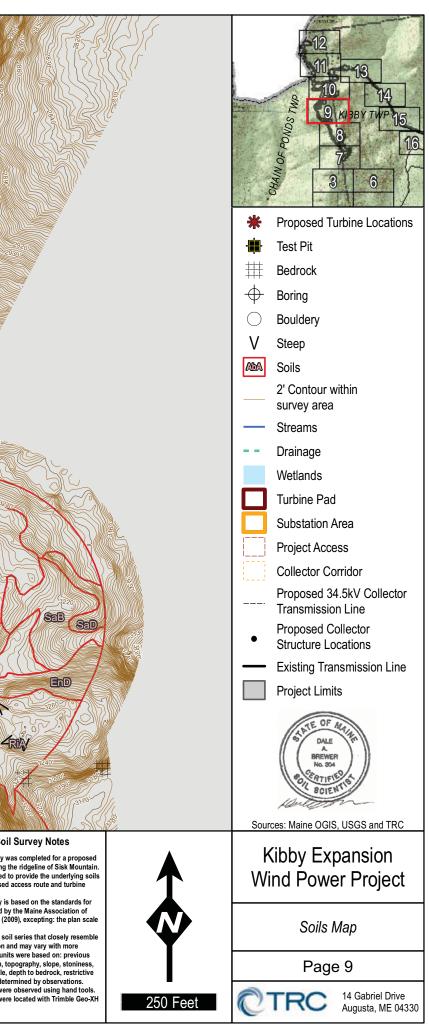
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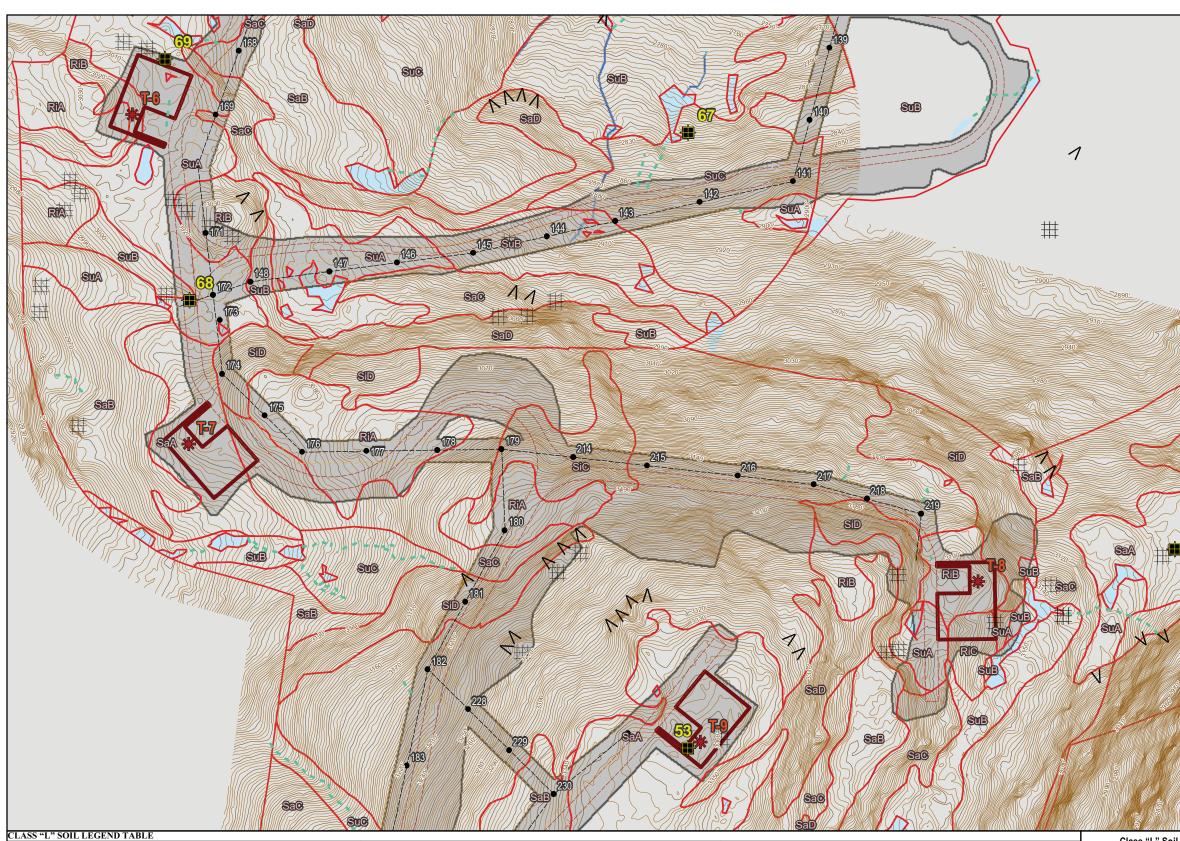
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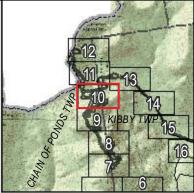
																666	
CLAS SYMB AbA	<mark>S "L" SOIL LEGEN</mark> OL SERIES ABRAM	D TABLE TEXTURE SL ¹	<u>SLOP</u> 0-15%	E DRAIN ED ²	AGE HSG SYMBO D EnB	OL SERIES ENCHANTE	TEXTURE ED FSL	193 RIG SLOPE 0-15%	ED AGE HSG SYI C/D Sa/	MBOL SEI	AB End RIES TE DDLEBACK	XTURE FSL	Elope 0-15%	1200 ¹ 3200 ¹	NAGE HSG	RiD	Soil

Class "L" Soll	GE HSG	DRAINAO	SLOPE	TURE	SERIES TEX	SYMBOL	E HSG	DRAINAG	SLOPE	TEXTURE	SERIES	G SYMBOL	GE HSG	DRAINAG	SLOPE	TEXTURE	SERIES	SYMBOL
1. This Class "L" Soil Survey wa	C/D	WD ⁹	0-15%	FSL	SADDLEBACK	SaA	C/D	WD9	0-15%	ED FSL	ENCHANT	EnB	D	ED ²	0-15%	SL^1	ABRAM	AbA
wind turbine expansion along th	C/D	WD ⁹	15-30%	FSL	SADDLEBACK	SaB	C/D	WD9	>40%	ED FSL	ENCHANT	EnD	D	ED ²	15-30%	SL^1	ABRAM	AbB
The soil survey was designed to limitations along the proposed a	C/D	WD ⁹	15-30%	FSL	SADDLEBACK	SaC	CD/C	ED/WD9	15-30%	NBRIDGEFSL/L ⁸	LYMAN TU	LtB	D	ED ²	30-40%	SL^1	ABRAM	AbC
locations.	C/D	WD ⁹	>40%	FSL	SADDLEBACK	SaD	CD/C	ED/WD ⁹	30-40%	NBRIDGEFSL/L ⁸	LYMAN TU	LtC	D	ED ²	>40%	SL^1	ABRAM	AbD
2. The Class "L" Soil Survey is b	Ċ	WD9	15-30%	FSL	SISK	SiC	CD/C	ED/WD	15-30%	NBRIDGEFSL/L	LYMAN TU	LtD	С	SWPD	0-15%	FSL	COLONEL	СоА
soil survey recently adopted by Professional Soil Scientists (200	С	WD9	30-40%	FSL	SISK	SiD	A	SWED10	15-30%	IC PEAT	MAHOOSU	MaB	С	PD ⁵	0-15%	L^8	BEMIS	BeA
of 1" = 250'.	PD C	MWD/SW	0-15%	SL	SURPLUS	SuA	А	SWED10	30-40%	IC PEAT	MAHOOSU	MaC	С	PD^5	15-30%	L^8	BEMIS	BeB
3. The map units shown are soil	'PD C	MWD/SW	15-30%	SL	SURPLUS	SuB	D	VPD ⁶	0-15%	MUCK	PEACHAM	PeA	D⁵ C	SWPD4/PD5	15-30%	FSL ³	BRAYTON	BrB
the typical pedon description an	'PD C	MWD/SW	30-40%	SL	SURPLUS	SuC	D	VPD ⁶	0-15%	MUCK	PEACHAM	PeB	D⁵ C	SWPD4/PD5	30-40%	FSL ³	BRAYTON	BrC
intensive surveys. The soil units impacts, landscape position, top	С	WD	0-15%	FSL	funbridge	TuA	А	SWED10	0-15%	PEAT	RICKER	RiA	С	SWPD	0-15%	FSL	COLONEL	СоА
depth to seasonal water table, de	С	WD	15-30%	FSL	FUNBRIDGE	TuB	А	SWED10	15-30%	PEAT	RICKER	RiB	С	SWPD	15-30%	FSL	COLONEL	СоВ
layers and soil textures as deter	С	WD	30-40%	FSL	FUNBRIDGE	TuC	А	SWED10	30-40%	PEAT	RICKER	RiC	С	MWD7	0-15%	FSL	DIXFIELD	DxA
4. All test pits and borings were 5. All test pits and borings were	С	WD	>40%	FSL	funbridge	TuD	А	SWED10	>40%	PEAT	RICKER	RiD	С	MWD7	15-30%	FSL	DIXFIELD	DxB
GPS units.	ΕD	VARIABLI	0-5%	VARIABLE	JDORTHENTS	UdA	D	VPD ⁶	0-15%	T MUCK	SEARSPOR	SeA	С	MWD ⁷	30-40%	FSL	DIXFIELD	DxC
	ЕD	VARIABLI	5-10%	VARIABLE	JDORTHENTS	UdB												





	oon noon a																		
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTURE	SL	OPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGI	E HSG	Class "L" Soil
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTE	ED FSL	0-1	.5%	WD ⁹	C/D	SaA	SADDLEBACK	K FSL	0-15%	WD ⁹	C/D	1. This Class "L" Soil Survey wa
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTE	ED FSL	>40	0%	WD ⁹	C/D	SaB	SADDLEBACK	K FSL	15-30%	WD ⁹	C/D	wind turbine expansion along th
AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TU	NBRIDGEFSL	/L ⁸ 15-	30%	ED/WD ⁹	CD/C	SaC	SADDLEBACK	K FSL	15-30%	WD ⁹	C/D	The soil survey was designed to limitations along the proposed a
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TU	NBRIDGEFSL	/L ⁸ 30-	40%	ED/WD ⁹	CD/C	SaD	SADDLEBACK	K FSL	>40%	WD ⁹	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TU	NBRIDGEFSL	L 15-	30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	Ċ	2. The Class "L" Soil Survey is b
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSU	C PEA	T 15-	30%	SWED10	Α	SiD	SISK	FSL	30-40%	WD ⁹	С	soil survey recently adopted by Professional Soil Scientists (200
BeB	BEMIS	L^8	15-30%	PD⁵	С	MaC	MAHOOSU	C PEA	Т 30-	40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWP	D C	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	MU	CK 0-1	5%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWP	D C	3. The map units shown are soil
BrC	BRAYTON	FSL ³	30-40%	SWPD4/PD5	С	PeB	PEACHAM	MU	CK 0-1	.5%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWP	D C	the typical pedon description an
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEA	Т 0-1	.5%	SWED10	А	TuA	TUNBRIDGE	FSL	0-15%	WD	С	intensive surveys. The soil units impacts, landscape position, to
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEA	T 15-	30%	SWED10	А	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, d
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С	RiC	RICKER	PEA	Т 30-	40%	SWED10	А	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as deter
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С	RiD	RICKER	PEA	T >40	0%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were 5. All test pits and borings were
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	Г MU	CK 0-1	.5%	VPD ⁶	D	UdA	UDORTHENT	S VARIABLE	0-5%	VARIABLE	D	GPS units.
													UdB	UDORTHENT	S VARIABLE	5-10%	VARIABLE	D	



	Sala Stort	
	*	Proposed Turbine Locations
		Test Pit
	##	Bedrock
	\oplus	Boring
	\bigcirc	Bouldery
	V	Steep
(1,	Aba	Soils
		2' Contour within survey area
3000: (2980)	—	Streams
		Drainage
		Wetlands
3060		Turbine Pad
		Substation Area
V		Project Access
<u>1980'</u>		Collector Corridor
		Proposed 34.5kV Collector Transmission Line
	•	Proposed Collector Structure Locations
	—	Existing Transmission Line
		Project Limits
		CANE OF MALE DALE A BREWER No. 304 CONTENTION BOILENTION

s "L" Soil Survey Notes

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ey was completed for a proposed ong the ridgeline of Sisk Mountain. Ned to provide the underlying soils used access route and turbine

y is based on the standards for d by the Maine Association of (2009), excepting: the plan scale

e soil series that closely resemble ion and may vary with more l units were based on: previous n, topography, siope, stoniness, ble, depth to bedrock, restrictive determined by observations. were observat using hand tools. were located with Trimble Geo-XH



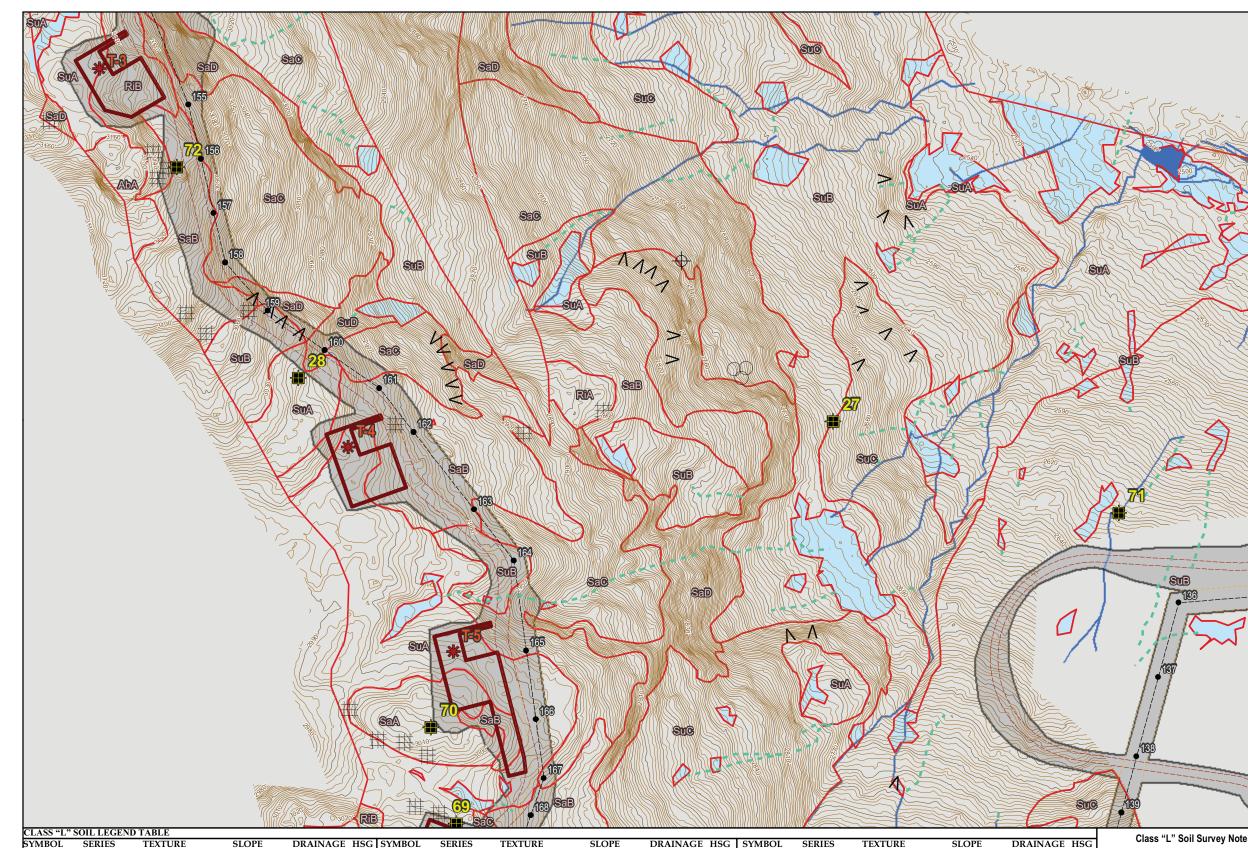
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Kibby Expansion Wind Power Project

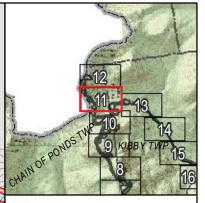
Sources: Maine OGIS, USGS and TRC

Soils Map

Page 10



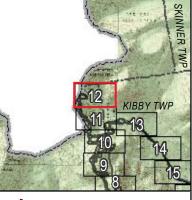
																	Clace "I " Soil Survey Notes
SYMBO	L SERIES	TEXTURE	SLOPE	DRAINAGE	E HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAG	E HSG	SYMBOL	SERIES TI	EXTURE	SLOPE	DRAINAGE I	ISG Class "L" Soil Survey Notes
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTED	FSL	0-15%	WD9	C/D	SaA	SADDLEBACK	FSL	0-15%		2/D 1. This Class "L" Soil Survey was completed for a pro
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTED	FSL	>40%	WD ⁹	C/D	SaB	SADDLEBACK	FSL	15-30%	WD9 C	$\rm C/D$ wind turbine expansion along the ridgeline of Sisk M
АЬС	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TUNI	BRIDGEFSL/L ⁸	15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBACK	FSL	15-30%	WD ⁹ C	The soil survey was designed to provide the underly limitations along the proposed access route and turb
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TUNI	BRIDGEFSL/L ⁸	30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBACK	FSL	>40%	WD9 C	C/D locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TUNI	BRIDGEFSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD9 C	2. The Class "L" Soil Survey is based on the standard
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSUC	PEAT	15-30%	SWED10	A	SiD	SISK	FSL	30-40%	WD9 C	 soil survey recently adopted by the Maine Associatio Professional Soil Scientists (2009), excepting: the pla
BeB	BEMIS	L^8	15-30%	PD⁵	С	MaC	MAHOOSUC	PEAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWPD 0	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWPD 0	
BrC	BRAYTON	FSL ³	30-40%	SWPD4/PD5	С	PeB	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWPD 0	the typical pedon description and may vary with more
CoA	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEAT	0-15%	SWED10	А	TuA	TUNBRIDGE	FSL	0-15%	WD C	intensive surveys. The soil units were based on: previmpacts, landscape position, topography, slope, ston
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEAT	15-30%	SWED10	А	TuB	TUNBRIDGE	FSL	15-30%	WD C	depth to seasonal water table, depth to bedrock, rest
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С	RiC	RICKER	PEAT	30-40%	SWED10	Α	TuC	TUNBRIDGE	FSL	30-40%	WD C	layers and soil textures as determined by observation
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С	RiD	RICKER	PEAT	>40%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD C	 4. All test pits and borings were observed using hand 5. All test pits and borings were located with Trimble
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	MUCK	0-15%	VPD ⁶	D	UdA	UDORTHENTS	VARIABLE	0-5%	VARIABLE I	GPS units.
												UdB	UDORTHENTS	VARIABLE	5-10%	VARIABLE I	



222 S S BIB	Proposed Turbine Locations
	🖶 Test Pit
	∰ Bedrock
	+ Boring
	Bouldery
	V Steep
	ADA Soils
	2' Contour within survey area
	Streams
3540	Drainage
	Wetlands
	Turbine Pad
	Substation Area
	Project Access
183	Collector Corridor
185	Proposed 34.5kV Collector Transmission Line
2	Proposed Collector Structure Locations
	Existing Transmission Line
	Project Limits
	DALE OF ALAR DALE A BRIEWER No. 304 BOLE NTIFIER Sources: Maine OGIS, USGS and TRC
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or a proposed Sisk Mountain. nderlying soils Id turbine	Kibby Expansion Wind Power Project
nderlying soils Id turbine tandards for ociation of the plan scale sely resemble th more	Soils Map
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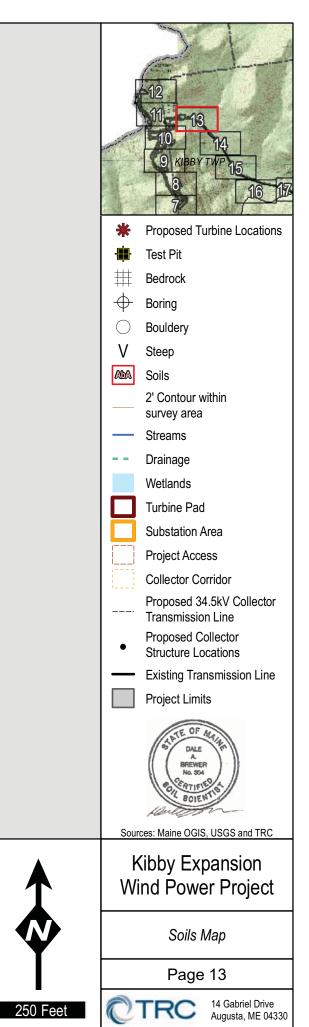
CLASS "L"	SOIL LEGEND	TABLE																Class "L" Soil Survey Notes
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAG	E HSG	SYMBOL	SERIES 1	TEXTURE	SLOPE	DRAINAGE	HSG	Class L Soll Survey Notes
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTED	FSL	0-15%	WD9	C/D	SaA	SADDLEBACK	FSL	0-15%	WD ⁹	C/D	1. This Class "L" Soil Survey was completed for a proposed
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTED	FSL	>40%	WD9	C/D	SaB	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	wind turbine expansion along the ridgeline of Sisk Mountain.
AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TUNI	BRIDGEFSL/L ⁸	15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	The soil survey was designed to provide the underlying soils limitations along the proposed access route and turbine
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TUNI	BRIDGEFSL/L ⁸	30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBACK	FSL	>40%	WD ⁹	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TUNI	BRIDGEFSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	Ċ	2. The Class "L" Soil Survey is based on the standards for
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSUC	PEAT	15-30%	SWED10	Á	SiD	SISK	FSL	30-40%	WD ⁹	С	soil survey recently adopted by the Maine Association of
BeB	BEMIS	L^8	15-30%	PD ⁵	С	MaC	MAHOOSUC	PEAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWPI	DС	Professional Soil Scientists (2009), excepting: the plan scale of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWPI	ЭC	3. The map units shown are soil series that closely resemble
BrC	BRAYTON	FSL ³	30-40%	SWPD ⁴ /PD ⁵	С	PeB	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWPI	DС	the typical pedon description and may vary with more
CoA	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEAT	0-15%	SWED10	А	TuA	TUNBRIDGE	FSL	0-15%	WD	С	intensive surveys. The soil units were based on: previous impacts, landscape position, topography, slope, stoniness,
СоВ	COLONEL	FSL	15-30%	SWPD	C	RiB	RICKER	PEAT	15-30%	SWED10	А	TuB	TUNBRIDGE	FSL	15-30%	WD	C	depth to seasonal water table, depth to bedrock, restrictive
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	C	RiC	RICKER	PEAT	30-40%	SWED10	А	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as determined by observations.
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С	RiD	RICKER	PEAT	>40%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were observed using hand tools.
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	C	SeA	SEARSPORT	MUCK	0-15%	VPD ⁶	D	UdA	UDORTHENTS	VARIABLE	0-5%	VARIABLE	D	5. All test pits and borings were located with Trimble Geo-XH GPS units.
												UdB	UDORTHENTS	VARIABLE	5-10%	VARIABLE	D	



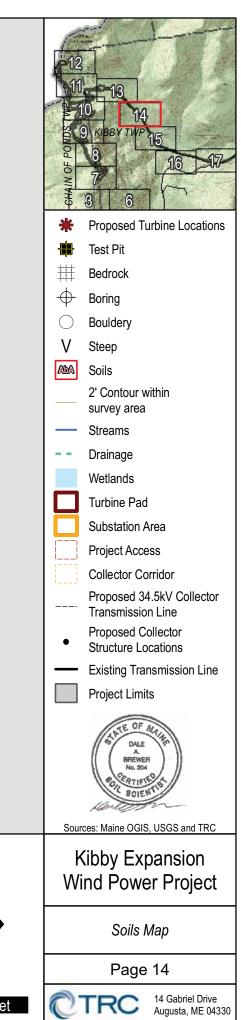
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		*	Proposed Turbine Locations
		÷	Test Pit
		##	Bedrock
		\oplus	Boring
		\bigcirc	Bouldery
		V	Steep
		Aba	Soils
			2' Contour within survey area
		—	Streams
			Drainage
			Wetlands
			Turbine Pad
			Substation Area
			Project Access
			Collector Corridor
			Proposed 34.5kV Collector Transmission Line
		٠	Proposed Collector Structure Locations
		—	Existing Transmission Line
			Project Limits
		Sour	Ces: Maine OGIS, USGS and TRC
ı. S			(ibby Expansion nd Power Project
•			Soils Map
			Page 12
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			DRAINAGE HSG SY ED ² D	MBOL SERIES TEXTUR		DRAINAGE HS		SERIES TEX SADDLEBACK		SLOPE		Class "L" Soil Survey Notes 1. This Class "L" Soil Survey was completed for a proportional of the property of
АЬВ АЬС	ABRAM ABRAM	$\begin{array}{cccc} SL^{1} & & 15.30\% \\ SL^{1} & & 30-40\% \end{array}$	$\begin{array}{ccc} ED^2 & D & En \\ ED^2 & D & LtE \end{array}$	D ENCHANTED F B LYMAN TUNBRIDGE	SL >40%	WD ⁹ C/ ED/WD ⁹ CE		SADDLEBACK SADDLEBACK	FSL	15-30%	WD9 C/D WD9 C/D	
AbD CoA	ABRAM	SL ¹ >40% FSL 0-15%	ED ² D LtC SWPD C LtE	C LYMAN TUNBRIDGE	FSL/L ⁸ 30-40%	ED/WD ⁹ CE	D/C SaD D/C SiC	SADDLEBACK SISK	FSL	>40%	WD ⁹ C/D WD ⁹ C	Immators along the proposed access route and turbine locations. 2. The Class "L" Soil Survey is based on the standards fi soil survey recently adopted by the Maine Association of
BeA BeB	BEMIS	L ⁸ 0-15% L ⁸ 15-30%	PD^5 C Ma PD^5 C Ma	B MAHOOSUC F	PEAT 15-30% PEAT 30-40%	SWED ¹⁰ A SWED ¹⁰ A	SiD	SISK SURPLUS	FSL	30-40%	WD ⁹ C MWD/SWPD C	soil survey recently adopted by the Maine Association of Professional Soil Scientists (2009), excepting: the plan s of 1" = 250'.
BrB BrC	BRAYTON	FSL ³ 15-30% FSL ³ 30-40%	SWPD ⁴ /PD ⁵ C Pel SWPD ⁴ /PD ⁵ C Pel	A PEACHAM M	MUCK 0-15% MUCK 0-15%	VPD ⁶ D VPD ⁶ D	SuB	SURPLUS SURPLUS	SL	15-30%	MWD/SWPD C MWD/SWPD C MWD/SWPD C	3. The map units shown are soil series that closely resen the typical pedon description and may vary with more
бгС СоА СоВ	COLONEL	FSL 0-15% FSL 15-30%	SWPD C Rif SWPD C Rif	A RICKER F	PEAT 0-15% PEAT 15-30%	SWED ¹⁰ A SWED ¹⁰ A	TuA	TUNBRIDGE TUNBRIDGE	FSL	0-15%	WD C WD C	intensive surveys. The soil units were based on: previou impacts, landscape position, topography, slope, stonines depth to seasonal water table, depth to bedrock, restricti
Cob DxA DxB	DIXFIELD	FSL 15-30% FSL 0-15% FSL 15-30%	MWD ⁷ C Ric	C RICKER F	PEAT 30-40%	SWED10 A	TuC	TUNBRIDGE TUNBRIDGE TUNBRIDGE	FSL	30-40%	WD C WD C WD C	depth to seasonal water table, depth to bedrock, restrict layers and soil textures as determined by observations. 4. All test pits and borings were observed using hand too 5. All test pits and borings were located with Trimble Geo
DxB DxC		FSL 15-30% FSL 30-40%	MWD ⁷ C RiI MWD ⁷ C Sez		PEAT >40% MUCK 0-15%	SWED ¹⁰ A VPD ⁶ D		UDORTHENTS UDORTHENTS	FSL VARIABLE VARIABLE	0-5%	VARIABLE D VARIABLE D	5. All test pits and borings were located with Trimble Geo GPS units.
			1				LUUD		VANIADLE	J=111/0		

-	пэG	DRAINAGE	SLOPE	TUKE	SERIES IE/	SIMBOL	с пэс	DRAINAG	SLUFE	EATURE	SERIES I
1. This Class "L" Soil Survey was completed for a proposed	C/D	WD ⁹	0-15%	FSL	SADDLEBACK	SaA	C/D	WD ⁹	0-15%	FSL	ENCHANTED
wind turbine expansion along the ridgeline of Sisk Mountain.		WD9	15-30%	FSL	SADDLEBACK	SaB	C/D	WD ⁹	>40%	FSL	ENCHANTED
The soil survey was designed to provide the underlying soils limitations along the proposed access route and turbine		WD ⁹	15-30%	FSL	SADDLEBACK	SaC	CD/C	ED/WD ⁹	15-30%	LIDGEFSL/L ⁸	LYMAN TUNBR
locations.	CID	WD ⁹	>40%	FSL	SADDLEBACK	SaD	CD/C	ED/WD ⁹	30-40%	IDGEFSL/L ⁸	LYMAN TUNBR
2. The Class "L" Soil Survey is based on the standards for		WD9	15-30%	FSL	SISK	SiC	CD/C	ED/WD	15-30%	SIDGEFSL/L	LYMAN TUNBR
soil survey recently adopted by the Maine Association of		WD ⁹	30-40%	FSL	SISK	SiD	Α	SWED10	15-30%	PEAT	MAHOOSUC
Professional Soil Scientists (2009), excepting: the plan scale of 1" = 250'.		MWD/SWPD	0-15%	SL	SURPLUS	SuA	A	SWED10	30-40%	PEAT	MAHOOSUC
3. The map units shown are soil series that closely resemble	-	MWD/SWPD	15-30%	SL	SURPLUS	SuB	D	VPD6	0-15%	MUCK	PEACHAM
the typical pedon description and may vary with more	-	MWD/SWPD	30-40%	SL	SURPLUS	SuC	D	VPD ⁶	0-15%	MUCK	PEACHAM
intensive surveys. The soil units were based on: previous	c	WD	0-15%	FSL	TUNBRIDGE	TuA	-	SWED ¹⁰	0-15%	PEAT	RICKER
impacts, landscape position, topography, slope, stoniness,	C						A		/-		
depth to seasonal water table, depth to bedrock, restrictive	C	WD	15-30%	FSL	TUNBRIDGE	TuB	А	SWED ¹⁰	15-30%	PEAT	RICKER
layers and soil textures as determined by observations.		WD	30-40%	FSL	TUNBRIDGE	TuC	А	SWED10	30-40%	PEAT	RICKER
4. All test pits and borings were observed using hand tools. 5. All test pits and borings were located with Trimble Geo-XH		WD	>40%	FSL	TUNBRIDGE	TuD	А	SWED10	>40%	PEAT	RICKER
GPS units.		VARIABLE	0-5%	VARIABLE	UDORTHENTS	UdA	D	VPD ⁶	0-15%	MUCK	SEARSPORT
	D	VARIABLE	5-10%	VARIABLE	UDORTHENTS	UdB					



CLASS "L" SOIL LEGEND TABLE																		
																		Class "L" Soil Survey Notes
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAG	E HSG	SYMBOL	SERIES T	EXTURE	SLOPE	DRAINAGE	HSG	
АЬА	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTED) FSL	0-15%	WD ⁹	C/D	SaA	SADDLEBACK	FSL	0-15%	WD ⁹	C/D	1. This Class "L" Soil Survey was completed for a propo
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTED) FSL	>40%	WD ⁹	C/D	SaB	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	wind turbine expansion along the ridgeline of Sisk Mour
AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TUN	BRIDGEFSL/L ⁸	15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	The soil survey was designed to provide the underlying limitations along the proposed access route and turbine
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TUN	BRIDGEFSL/L ⁸	30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBACK	FSL	>40%	WD ⁹	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TUN	BRIDGEFSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	С	2. The Class "L" Soil Survey is based on the standards
BeA	BEMIS	L^8	0-15%	PD⁵	С	MaB	MAHOOSUC	PEAT	15-30%	SWED10	Α	SiD	SISK	FSL	30-40%	WD ⁹	С	soil survey recently adopted by the Maine Association of Professional Soil Scientists (2009), excepting: the plan s
BeB	BEMIS	L^8	15-30%	PD⁵	С	MaC	MAHOOSUC	PEAT	30-40%	SWED10	Α	SuA	SURPLUS	SL	0-15%	MWD/SWPD	C	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWPD	C	3. The map units shown are soil series that closely reserved
BrC	BRAYTON	FSL ³	30-40%	SWPD4/PD5	С	PeB	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWPD	C	the typical pedon description and may vary with more
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEAT	0-15%	SWED10	Α	TuA	TUNBRIDGE	FSL	0-15%	WD	С	intensive surveys. The soil units were based on: previou impacts, landscape position, topography, slope, stoning
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEAT	15-30%	SWED10	Α	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, depth to bedrock, restrict
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С	RiC	RICKER	PEAT	30-40%	SWED10	Α	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as determined by observations.
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С	RiD	RICKER	PEAT	>40%	SWED10	Α	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were observed using hand to 5. All test pits and borings were located with Trimble Ge
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	MUCK	0-15%	VPD ⁶	D	UdA	UDORTHENTS	VARIABLE	0-5%	VARIABLE	D	GPS units.
												UdB	UDORTHENTS	VARIABLE	5-10%	VARIABLE	D	



Created: 11/25/2009

was completed for a proposed the ridgeline of Sisk Mountain. to provide the underlying soils d access route and turbine

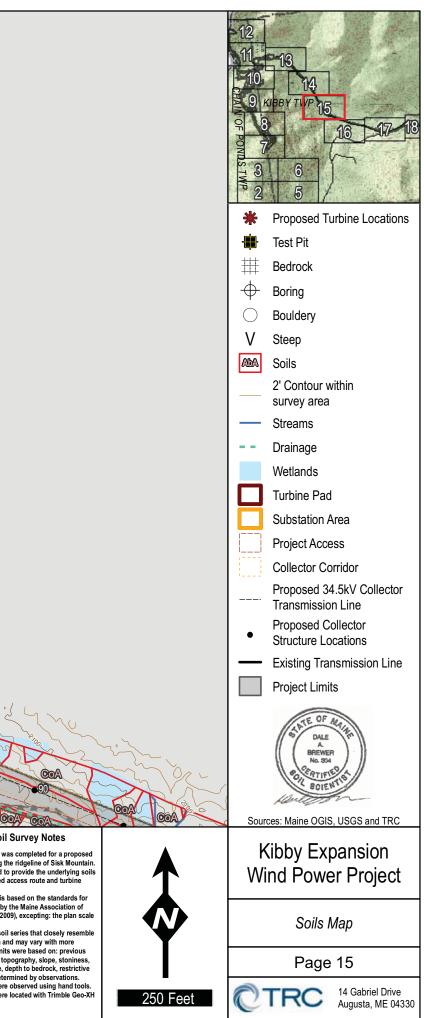
based on the standards for y the Maine Association of 009), excepting: the plan scale

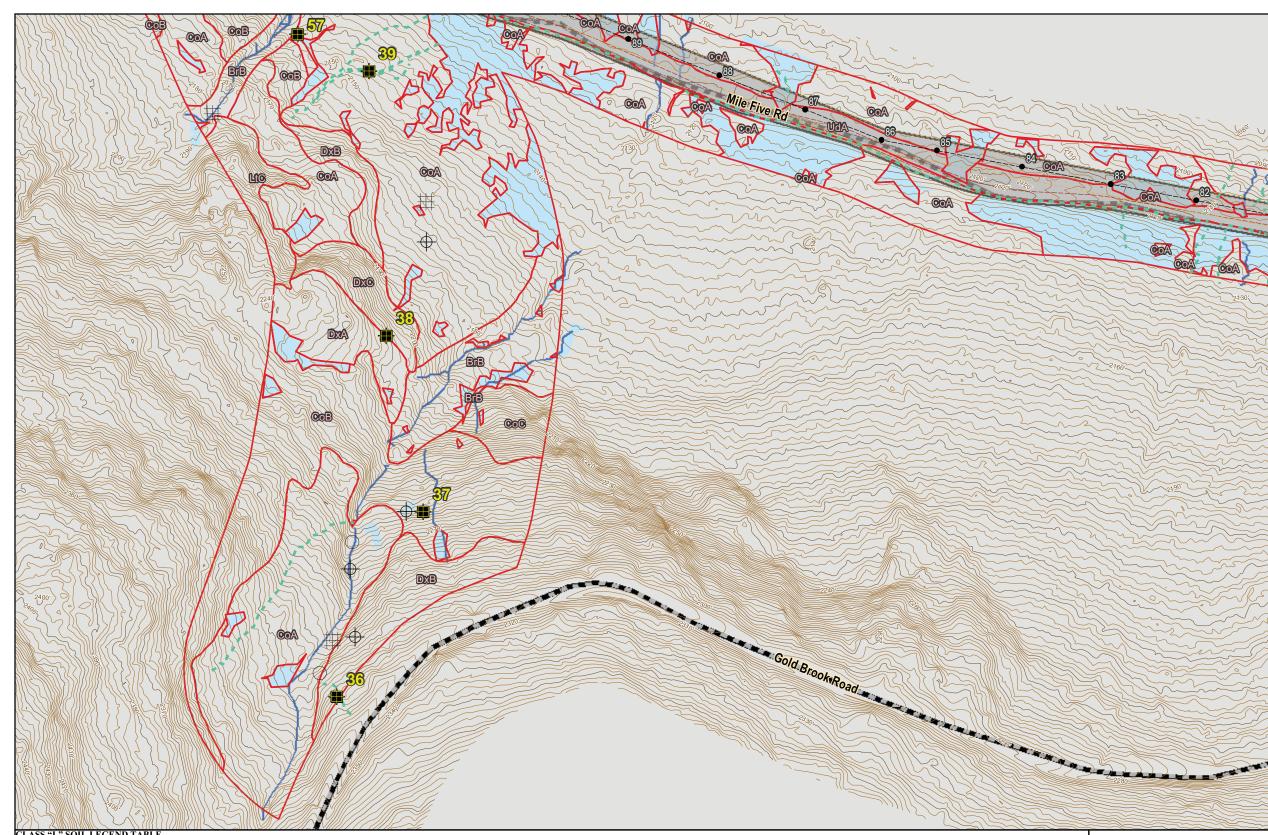
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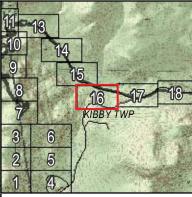
										y.
CLASS "L" SOIL LEGEND TA SYMBOL SERIES T AbA ABRAM	ABLE EXTURE SL ¹ 0-15%	DRAINAGE HSG SY ED ² D Ent	MBOL SERIES TE ENCHANTED	XTURE SLOPE FSL 0-15%	DRAINAGE HSC WD ⁹ C/E	G SYMBOL SERII SaA SADE	ES TEXTURE DLEBACK FSL	57	COA	2100' 2100' 00 00 00 00 00 00 00 00 00 00 00 00

SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAG	E HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	E HSG	
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTE	ED FSL	0-15%	WD ⁹	C/D	SaA	SADDLEBACK	S FSL	0-15%	WD ⁹	C/D	1. This Class "L" Soil Survey was
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTE	ED FSL	>40%	WD ⁹	C/D	SaB	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	wind turbine expansion along the
AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TUI	NBRIDGEFSL/L ⁸	15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	The soil survey was designed to p limitations along the proposed acc
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TUN	NBRIDGEFSL/L ⁸	30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBACK	K FSL	>40%	WD ⁹	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TUN	NBRIDGEFSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	С	2. The Class "L" Soil Survey is bas
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSU	C PEAT	15-30%	SWED10	A	SiD	SISK	FSL	30-40%	WD ⁹	С	soil survey recently adopted by th Professional Soil Scientists (2009)
BeB	BEMIS	L^8	15-30%	PD⁵	С	MaC	MAHOOSU	C PEAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWP	D C	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWP	D C	3. The map units shown are soil se
BrC	BRAYTON	FSL ³	30-40%	SWPD4/PD5	С	PeB	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWP	D C	the typical pedon description and
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEAT	0-15%	SWED10	Α	TuA	TUNBRIDGE	FSL	0-15%	WD	С	intensive surveys. The soil units w impacts, landscape position, topo
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEAT	15-30%	SWED10	Α	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, dep
DxA	DIXFIELD	FSL	0-15%	MWD7	С	RiC	RICKER	PEAT	30-40%	SWED10	А	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as determ
DxB	DIXFIELD	FSL	15-30%	MWD7	С	RiD	RICKER	PEAT	>40%	SWED10	Α	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were of 5. All test pits and borings were lo
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	MUCK	0-15%	VPD ⁶	D	UdA	UDORTHENTS	5 VARIABLE	0-5%	VARIABLE	D	GPS units.
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CLASS "L"															Class "L" Soil Si				
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEX	TURE	SLOPE	DRAINAGE	E HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAG	E HSG	
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTE	ED	FSL	0-15%	WD ⁹	C/D	SaA	SADDLEBAC	CK FSL	0-15%	WD ⁹	C/D	1. This Class "L" Soil Survey was o
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTE	ED	FSL	>40%	WD ⁹	C/D	SaB	SADDLEBAC	CK FSL	15-30%	WD ⁹	C/D	wind turbine expansion along the r
AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TU	NBRID	DGEFSL/L ⁸	15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBAG	CK FSL	15-30%	WD ⁹	C/D	The soil survey was designed to pr limitations along the proposed acc
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TU	NBRID	DGEFSL/L ⁸	30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBAG	CK FSL	>40%	WD ⁹	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TU	NBRID	DGEFSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	Ċ	2. The Class "L" Soil Survey is bas
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BeB	BEMIS	L^8	15-30%	PD⁵	С	MaC	MAHOOSU	IC	PEAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWF	D C	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM		MUCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWF	'D C	3. The map units shown are soil se
BrC	BRAYTON	FSL ³	30-40%	SWPD4/PD5	С	PeB	PEACHAM		MUCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWF	'D C	the typical pedon description and
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER		PEAT	0-15%	SWED10	А	TuA	TUNBRIDGE	FSL	0-15%	WD	С	intensive surveys. The soil units w impacts, landscape position, topog
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER		PEAT	15-30%	SWED10	Α	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, dept
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С	RiC	RICKER		PEAT	30-40%	SWED10	А	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as determine
DxB	DIXFIELD	FSL	15-30%	MWD7	С	RiD	RICKER		PEAT	>40%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were ob 5. All test pits and borings were loo
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	Г	MUCK	0-15%	VPD ⁶	D	UdA	UDORTHEN	TS VARIABLE	0-5%	VARIABLE	D	GPS units.
													UdB	UDORTHEN	TS VARIABLE	5-10%	VARIABLE	D	



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	*	Proposed Turbine Locations
		Test Pit
	###	Bedrock
	\oplus	Boring
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	V	Steep
	Aba	Soils
		2' Contour within survey area
	—	Streams
		Drainage
		Wetlands
		Turbine Pad
		Substation Area
		Project Access
		Collector Corridor
		Proposed 34.5kV Collector Transmission Line
	•	Proposed Collector Structure Locations
\sum	_	Existing Transmission Line
ALL ALL		Project Limits
		SATE OF Marshi DALE A BREWER No. 304 BOTENTIES SOTENTIES
	Sour	ces: Maine OGIS, USGS and TRC
		libby Expansion nd Power Project
		Soils Map
		Page 16

Survey Notes

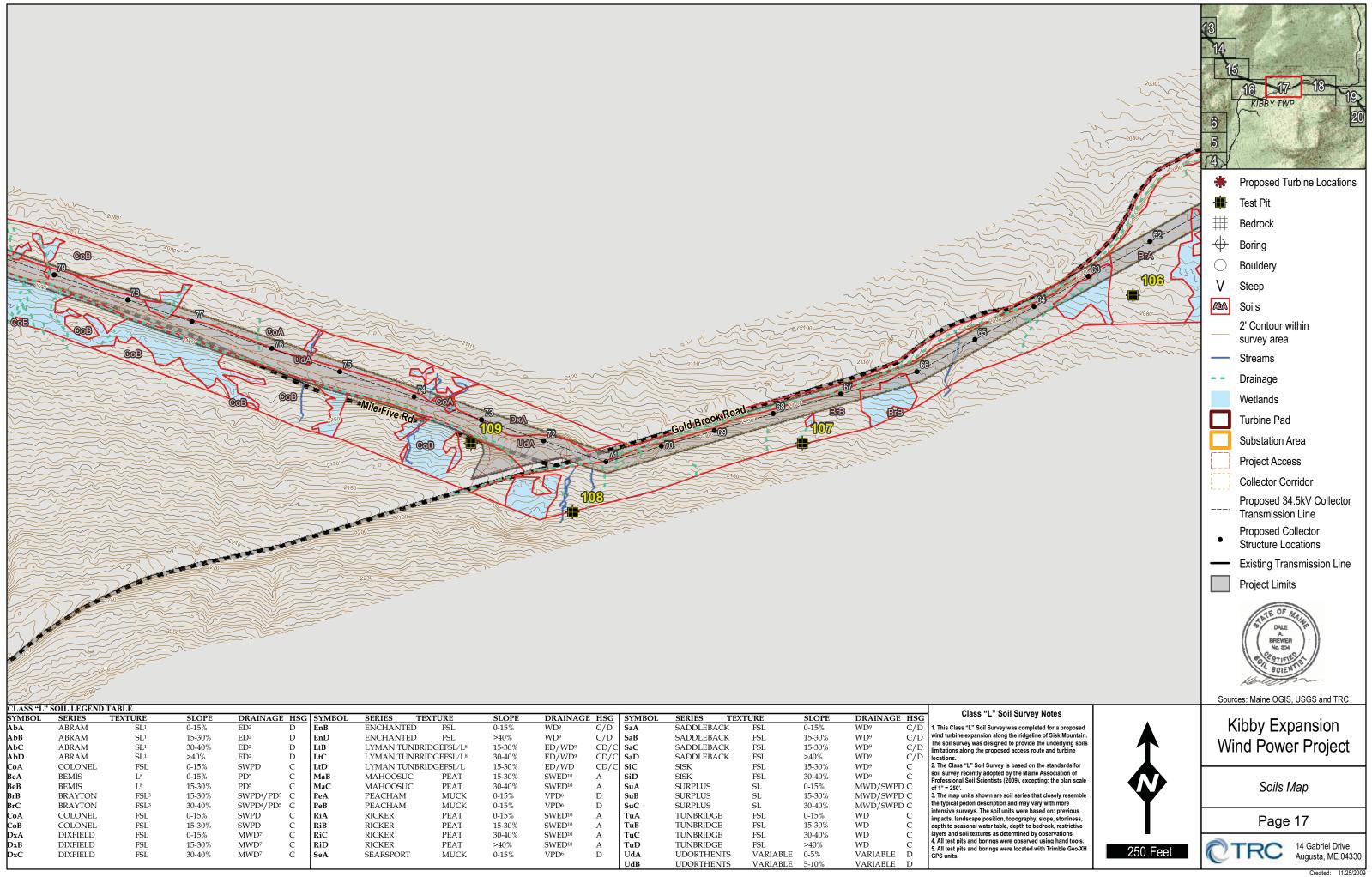
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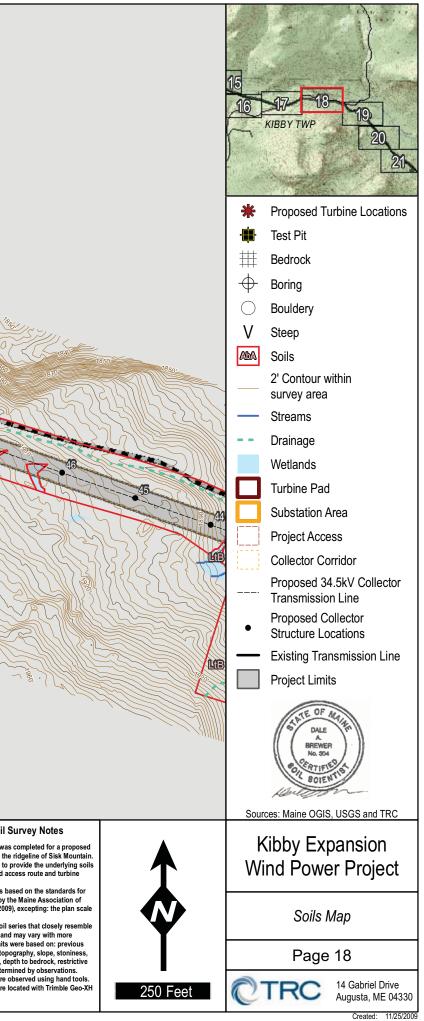
Page 16



CLASS L	SOIL LEGENI	J TADLE																 Class "L" Soil Su
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAC	GE HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	E HSG	
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTE	D FSL	0-15%	WD9	C/D	SaA	SADDLEBAC	K FSL	0-15%	WD9	C/D	1. This Class "L" Soil Survey was c
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTE	D FSL	>40%	WD ⁹	C/D	SaB	SADDLEBAC	K FSL	15-30%	WD ⁹	C/D	wind turbine expansion along the ri
АЬС	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TUN	NBRIDGEFSL/L	⁸ 15-30%	ED/WD ⁹	CD/C	SaC	SADDLEBAC	K FSL	15-30%	WD ⁹	C/D	The soil survey was designed to pr limitations along the proposed according
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TUN	NBRIDGEFSL/L	8 30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBAC	K FSL	>40%	WD ⁹	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TUN	NBRIDGEFSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	C	2. The Class "L" Soil Survey is base
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSUC	C PEAT	15-30%	SWED10	A	SiD	SISK	FSL	30-40%	WD ⁹	С	soil survey recently adopted by the Professional Soil Scientists (2009),
BeB	BEMIS	L^8	15-30%	PD⁵	С	MaC	MAHOOSUC	C PEAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWPI	D C	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD ⁴ /PD ⁵	С	PeA	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWPI	DС	3. The map units shown are soil ser
BrC	BRAYTON	FSL ³	30-40%	SWPD4/PD5	С	PeB	PEACHAM	MUCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWPI	D C	the typical pedon description and n
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEAT	0-15%	SWED10	А	TuA	TUNBRIDGE	FSL	0-15%	WD	С	intensive surveys. The soil units we impacts, landscape position, topog
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEAT	15-30%	SWED10	А	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, dept
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С	RiC	RICKER	PEAT	30-40%	SWED10	А	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as determine
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С	RiD	RICKER	PEAT	>40%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were obs 5. All test pits and borings were loc
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	MUCK	0-15%	VPD ⁶	D	UdA	UDORTHENT	S VARIABLE	0-5%	VARIABLE	D	GPS units.
												UdB	UDORTHENT	S VARIABLE	5-10%	VARIABLE	D	

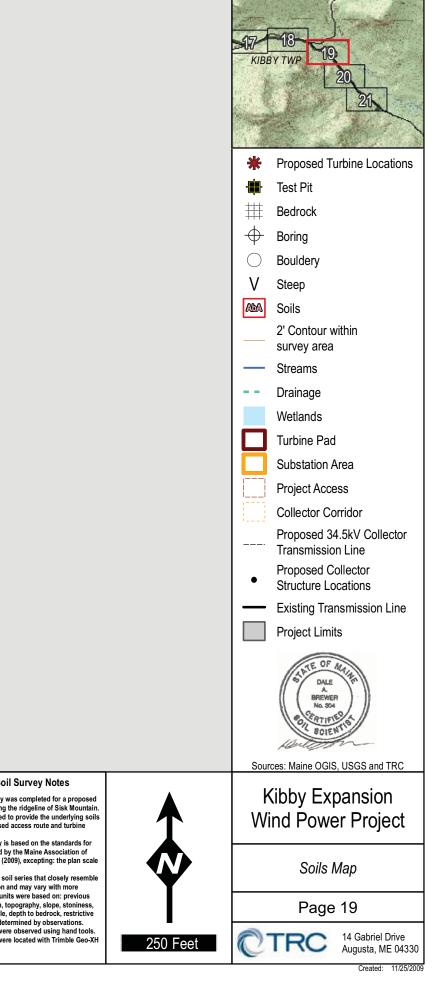
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CLASS "L"	SOIL LEGENI) TABLE																	Class "L" Soil Su
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTU	RE	SLOPE	DRAINAG	E HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAG	E HSG	
AbA	ABRAM	SL^1	0-15%	ED ²	D	EnB	ENCHANTE	ED F	FSL	0-15%	WD ⁹	C/D	SaA	SADDLEBACK	K FSL	0-15%	WD9	C/D	1. This Class "L" Soil Survey was o
AbB	ABRAM	SL^1	15-30%	ED ²	D	EnD	ENCHANTE	ED F	FSL	>40%	WD ⁹	C/D	SaB	SADDLEBACK	FSL	15-30%	WD9	C/D	wind turbine expansion along the r
AbC	ABRAM	SL^1	30-40%	ED ²	D	LtB	LYMAN TU	NBRIDGEI	FSL/L ⁸	15-30%	ED/WD9	CD/C	SaC	SADDLEBACK	FSL	15-30%	WD ⁹	C/D	The soil survey was designed to pr limitations along the proposed acc
AbD	ABRAM	SL^1	>40%	ED ²	D	LtC	LYMAN TU	NBRIDGE	FSL/L ⁸	30-40%	ED/WD ⁹	CD/C	SaD	SADDLEBACK	FSL	>40%	WD9	C/D	locations.
СоА	COLONEL	FSL	0-15%	SWPD	С	LtD	LYMAN TU	NBRIDGEI	FSL/L	15-30%	ED/WD	CD/C	SiC	SISK	FSL	15-30%	WD ⁹	C	2. The Class "L" Soil Survey is bas
BeA	BEMIS	L^8	0-15%	PD ⁵	С	MaB	MAHOOSU	C P	PEAT	15-30%	SWED10	Α	SiD	SISK	FSL	30-40%	WD ⁹	С	soil survey recently adopted by the Professional Soil Scientists (2009).
BeB	BEMIS	L^8	15-30%	PD⁵	С	MaC	MAHOOSU	C P	PEAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWP	D C	of 1" = 250'.
BrB	BRAYTON	FSL ³	15-30%	SWPD4/PD5	С	PeA	PEACHAM	Ν	MUCK	0-15%	VPD ⁶	D	SuB	SURPLUS	SL	15-30%	MWD/SWP	D C	3. The map units shown are soil se
BrC	BRAYTON	FSL ³	30-40%	SWPD ⁴ /PD ⁵	С	PeB	PEACHAM	Ν	MUCK	0-15%	VPD ⁶	D	SuC	SURPLUS	SL	30-40%	MWD/SWP	D C	the typical pedon description and r
СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	P	PEAT	0-15%	SWED10	А	TuA	TUNBRIDGE	FSL	0-15%	WD	С	intensive surveys. The soil units w impacts, landscape position, topog
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	Р	PEAT	15-30%	SWED10	А	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, dep
DxA	DIXFIELD	FSL	0-15%	MWD7	С	RiC	RICKER	P	PEAT	30-40%	SWED10	А	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as determine
DxB	DIXFIELD	FSL	15-30%	MWD7	С	RiD	RICKER	P	PEAT	>40%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were of 5. All test pits and borings were lo
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	Г М	MUCK	0-15%	VPD ⁶	D	UdA	UDORTHENTS	5 VARIABLE	0-5%	VARIABLE	D	GPS units.
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	SOIL LEGEND		CLODE	DRAMACE	1100	CALDOL	CEDIEC		CLOPE	DRADIAC		CALDOL	CEBIEC		CLODE	DRADUCE	1100	Class "L" Soil S
SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAGE	HSG	SYMBOL	SERIES	TEXTURE	SLOPE	DRAINAG		SYMBOL		TEXTURE	SLOPE	DRAINAGE	HSG	
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BeB	BEMIS	L^8	15-30%	PD ⁵	С	MaC	MAHOOSU	C PEAT	30-40%	SWED10	А	SuA	SURPLUS	SL	0-15%	MWD/SWPI	DС	of 1" = 250'.
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СоА	COLONEL	FSL	0-15%	SWPD	С	RiA	RICKER	PEAT	0-15%	SWED10	А	TuA	TUNBRIDGE	FSL	0-15%	WD	С	intensive surveys. The soil units impacts, landscape position, top
СоВ	COLONEL	FSL	15-30%	SWPD	С	RiB	RICKER	PEAT	15-30%	SWED10	А	TuB	TUNBRIDGE	FSL	15-30%	WD	С	depth to seasonal water table, de
DxA	DIXFIELD	FSL	0-15%	MWD ⁷	С	RiC	RICKER	PEAT	30-40%	SWED10	А	TuC	TUNBRIDGE	FSL	30-40%	WD	С	layers and soil textures as determ
DxB	DIXFIELD	FSL	15-30%	MWD ⁷	С	RiD	RICKER	PEAT	>40%	SWED10	А	TuD	TUNBRIDGE	FSL	>40%	WD	С	4. All test pits and borings were of 5. All test pits and borings were I
DxC	DIXFIELD	FSL	30-40%	MWD ⁷	С	SeA	SEARSPORT	MUCK	0-15%	VPD ⁶	D	UdA	UDORTHENT	S VARIABLE	0-5%	VARIABLE	D	GPS units.
												UdB	UDORTHENT	S VARIABLE	5-10%	VARIABLE	D	



					φ.,		Part Part Part Part Part Part Part Part		GOA 15 · · ·
CLASS "L" SOIL LEGENESYMBOLSERIESAbAABRAMAbBABRAMAbCABRAMAbDABRAMCoACOLONELBeABEMISBeBBEMISBrCBRAYTONBrCBRAYTONCoACOLONELCoBCOLONELCoBCOLONELDxADIXFIELDDxBDIXFIELD	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	DRAINAGE HSG SYMBOL ED ² D EnB ED ² D EnD ED ² D LtB ED ² D LtC SWPD C LtD PD ⁵ C MaB PD ⁵ C PeA SWPD ⁴ /PD ⁵ C PeB SWPD C RiA SWPD C RiB MWD ⁷ C RiC MWD ⁷ C RiD	SERIESTEXTUREENCHANTEDFSLENCHANTEDFSLLYMAN TUNBRIDGEFSL/L³LYMAN TUNBRIDGEFSL/L³LYMAN TUNBRIDGEFSL/LMAHOOSUCPEATMAHOOSUCPEATPEACHAMMUCKPEACHAMMUCKRICKERPEATRICKERPEATRICKERPEATRICKERPEATRICKERPEATRICKERPEAT	SLOPE DRAINAG 0-15% WD ⁹ >40% WD ⁹ 15-30% ED/WD ⁹ 30-40% ED/WD ⁹ 15-30% ED/WD ⁹ 15-30% ED/WD ⁹ 15-30% SWED ¹⁰ 30-40% SWED ¹⁰ 0-15% VPD ⁶ 0-15% SWED ¹⁰ 15-30% SWED ¹⁰ 30-40% SWED ¹⁰	E HSG SYMBOL C/D SaA C/D SaB CD/C SaC CD/C SaD CD/C SiD A SiD A SuA D SuB D SuC A TuA A TuB A TuD	SERIESTEXTURESADDLEBACKFSLSADDLEBACKFSLSADDLEBACKFSLSADDLEBACKFSLSISKFSLSURPLUSSLSURPLUSSLSURPLUSSLTUNBRIDGEFSLTUNBRIDGEFSLTUNBRIDGEFSLTUNBRIDGEFSLTUNBRIDGEFSL	$\begin{array}{ccccc} & 0.15\% \\ & 15.30\% \\ & 15.30\% \\ & >40\% \\ & 15.30\% \\ & 30.40\% \\ & 0.15\% \\ & 15.30\% \\ & 30.40\% \\ & 0.15\% \\ & 15.30\% \\ & 30.40\% \\ & 30.40\% \end{array}$	DRAINAGE HSG WD ⁹ C/D WD ⁹ C WD ⁹ C MWD ⁹ C MWD/SWPD C MWD/SWPD C MWD/SWPD C WD C WD C WD C WD C WD C WD C	Class "L" Soil 3 1. This Class "L" Soil Survey wa: wind turbine expansion along the The soil survey was designed to limitations along the proposed an locations. 2. The Class "L" Soil Survey is b soil survey recently adopted by t Professional Soil Scientists (200 of 1" = 250'. 3. The map units shown are soil : the typical pedon description and intensive surveys. The soil units impacts, landscape position, top depth to seasonal water table, de layers and soil textures as deterr 4. All test pits and borings were

VPD⁶

A D

UdA

UdB

UDORTHENTS

UDORTHENTS

DIXFIELD

DxB DxC

30-40%

FSL

FSL

MWD⁷

С

С

SeA

SEARSPORT

MUCK

0-15%

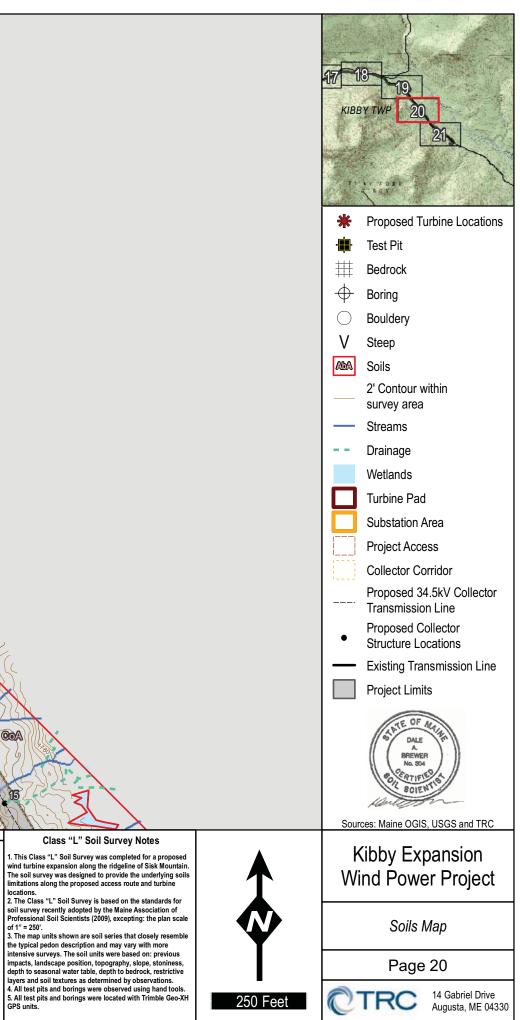
VARIABLE 0-5%

VARIABLE 5-10%

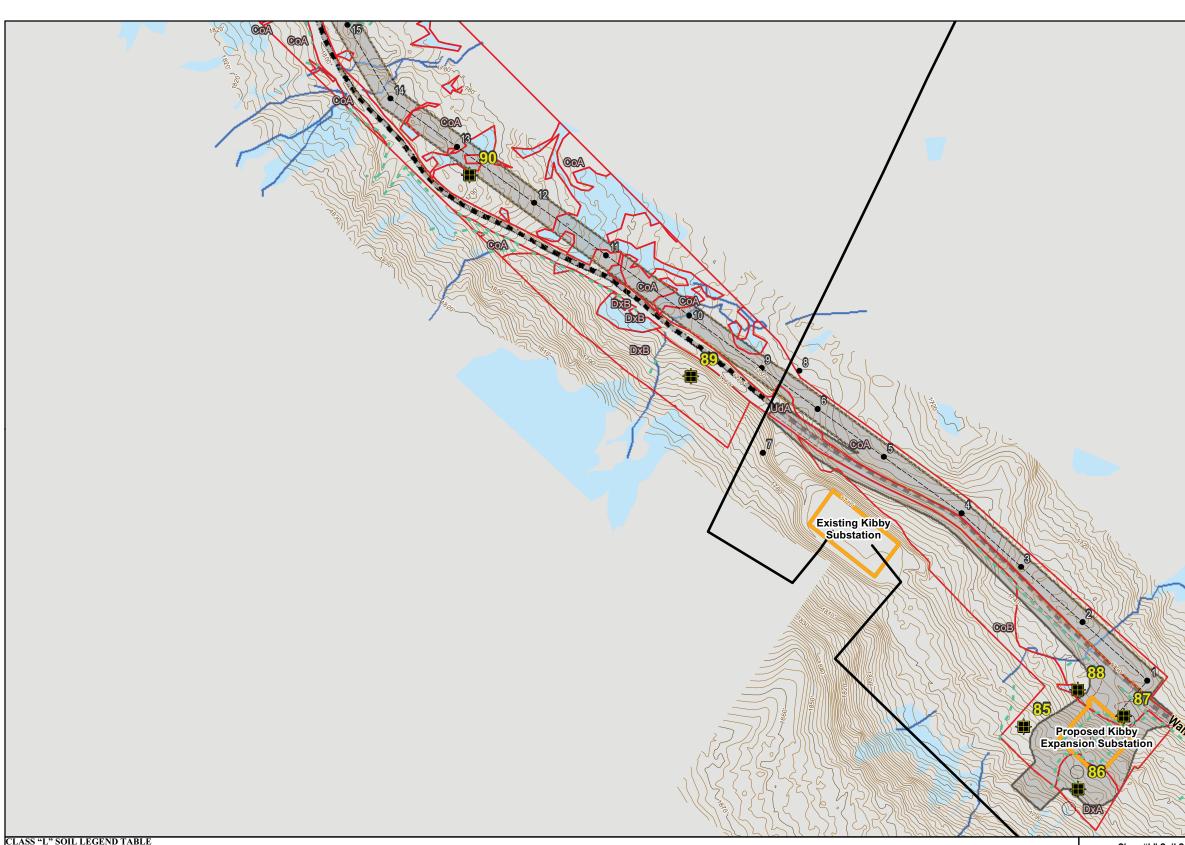
GPS units.

VARIABLE D

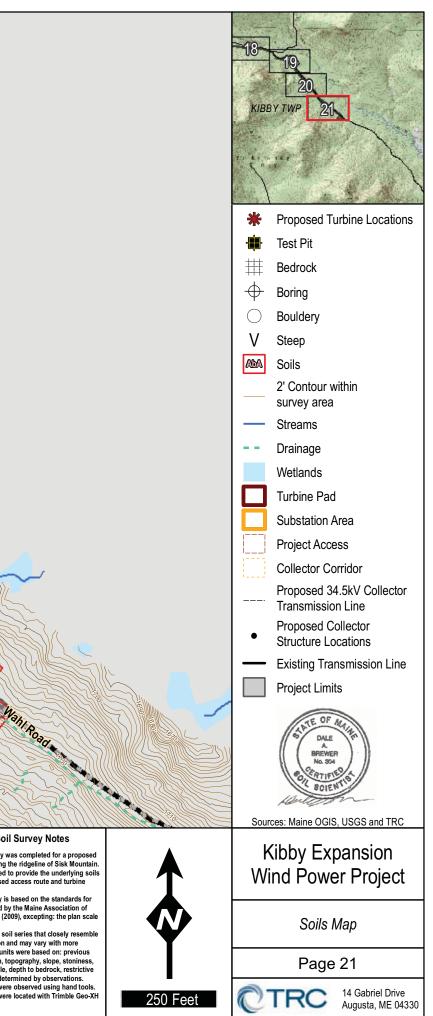
VARIABLE D



Created: 11/25/2009



Class "L" So																DIADLE	SOIL LEGEN	CLASS L
	NAGE HSG	DRAIN	SLOPE	EXTURE	SERIES	SYMBOL	E HSG	DRAINAC	SLOPE	TEXTURE	SERIES	SYMBOL	E HSG	DRAINAGI	SLOPE	TEXTURE	SERIES	SYMBOL
	C/D	WD9	0-15%	FSL	SADDLEBAC	SaA	C/D	WD ⁹	0-15%	ED FSL	ENCHANTI	EnB	D	ED ²	0-15%	SL^1	ABRAM	AbA
D wind turbine expansion along	C/D	WD9	15-30%	FSL	SADDLEBAC	SaB	C/D	WD ⁹	>40%	ED FSL	ENCHANTI	EnD	D	ED ²	15-30%	SL^1	ABRAM	АЬВ
D The soil survey was designed limitations along the proposed	C/D	WD ⁹	15-30%	FSL	SADDLEBAC	SaC	CD/C	ED/WD ⁹	15-30%	JNBRIDGEFSL/L ⁸	LYMAN TU	LtB	D	ED ²	30-40%	SL^1	ABRAM	AbC
D locations.	C/D	WD9	>40%	FSL	SADDLEBAC	SaD	CD/C	ED/WD ⁹	30-40%	JNBRIDGEFSL/L ⁸	LYMAN TU	LtC	D	ED ²	>40%	SL^1	ABRAM	AbD
2. The Class "L" Soil Survey is	С	WD9	15-30%	FSL	SISK	SiC	CD/C	ED/WD	15-30%	JNBRIDGEFSL/L	LYMAN TU	LtD	С	SWPD	0-15%	FSL	COLONEL	СоА
soil survey recently adopted to Professional Soil Scientists (2	С	WD9	30-40%	FSL	SISK	SiD	Α	SWED10	15-30%	JC PEAT	MAHOOSU	MaB	С	PD ⁵	0-15%	L^8	BEMIS	BeA
of 1" = 250'.	/SWPD C	MWD/S	0-15%	SL	SURPLUS	SuA	Α	SWED10	30-40%	JC PEAT	MAHOOSU	MaC	С	PD ⁵	15-30%	L^8	BEMIS	BeB
3. The map units shown are so	/SWPD C	MWD/S	15-30%	SL	SURPLUS	SuB	D	VPD ⁶	0-15%	MUCK	PEACHAM	PeA	95 C	SWPD4/PD5	15-30%	FSL ³	BRAYTON	BrB
the typical pedon description	/SWPD C	MWD/S	30-40%	SL	SURPLUS	SuC	D	VPD ⁶	0-15%	MUCK	PEACHAM	PeB	05 C	SWPD4/PD5	30-40%	FSL ³	BRAYTON	BrC
intensive surveys. The soil un impacts, landscape position, t	С	WD	0-15%	FSL	TUNBRIDGE	TuA	Α	SWED10	0-15%	PEAT	RICKER	RiA	С	SWPD	0-15%	FSL	COLONEL	СоА
depth to seasonal water table,	С	WD	15-30%	FSL	TUNBRIDGE	TuB	Α	SWED10	15-30%	PEAT	RICKER	RiB	С	SWPD	15-30%	FSL	COLONEL	СоВ
layers and soil textures as det	С	WD	30-40%	FSL	TUNBRIDGE	TuC	Α	SWED10	30-40%	PEAT	RICKER	RiC	С	MWD ⁷	0-15%	FSL	DIXFIELD	DxA
4. All test pits and borings we 5. All test pits and borings we	С	WD	>40%	FSL	TUNBRIDGE	TuD	Α	SWED10	>40%	PEAT	RICKER	RiD	С	MWD ⁷	15-30%	FSL	DIXFIELD	DxB
GPS units.	ABLE D	VARIAE	0-5%	VARIABLE	UDORTHENT	UdA	D	VPD ⁶	0-15%	T MUCK	SEARSPORT	SeA	С	MWD ⁷	30-40%	FSL	DIXFIELD	DxC
	ABLE D	VARIAE	5-10%	VARIABLE	UDORTHENT	UdB												



-	s SANDY c LOAM				-	5			
DEPTH BELOW MINERAL SOIL SURFACE (Inches)	7				(Inches)	7			
(Inc	a VERY				Inc	ORGANIC			
2	 FINE 		5YR 2.5/2			WITH		10YR 2/2	
¥-		THIXOTROPIC		7.5YR 3/3	SURFACE	SAND	VERY		
<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	2 LOAM	FRIABLE			<u><u> </u></u>		FRIABLE		
- St	SANDY			-	T SU				
18 -	LOAM		10YR 3/3		SOIL -				
ST ST			10110.00		s 7				
RA-	LIMIT	OF	TEST	PIT	DEPTH BELOW MINERAL				
9-					19-	SILT		5GY 4/1	
IW -					W-	LOAM			
3-					18-				
2	00					\$			
B _					18_				
E-					16-	REFUSAL	32"	ASSUMED	BEDROCK
<u>10</u> -				-	10 -				
					11 -				
-					- 1				
	90				1 7	0			
-					11 -				
- 7									
0	hydric	Slope %	Limiting factor	 ground water 		hydric	Slope %	Limiting factor	ground water
	non-hydric	15-30	10"	restrictive layer bedrock	•	non-hydric	0-15	0"	restrictive layer bedrock
	Soil Series / phase name:		STONY	Drainage HSG		Soil Series / phase name:			Drainage HSG
CSS	1	SURPLUS	SANDY LOAM	SWPD C	C.S.S.		PEACHAM	VARIANT	VPD D
								100	
	SOIL	L DESCRIPTION ANI	D CLASSIFICATION			SOI	L DESCRIPTION AN	D CLASSIFICATION	4
	Exploration Symbol:	TP 22	X Test Pit	Boring	11	Exploration Symbol:	TP 23	X Test Pit	Boring
	2	* Depth of Organic Horizo	n Above Mineral Soil		11	8	* Depth of Organic Horizo	n Above Mineral Soil	
	Texture		Color	Mottling	ti	Texture	Consistency	Color	Mottling
	1	Consistency VERY	7.5Y 5/1		11 –	1			
	(r	FRIABLE	5YR 2.5/1			2		5YR 2. 5/1	
	5				- 14	SANDY	FRIABLE		
	s VERY		5YR 2.5/2		1 -	LOAM	FRIADLE		2.5Y 5/2
~ -	6 FINE		51K 2.5/2			2 8		2.5Y 4/3	7.5YR 2.5/2
hes	7 SANDY				hes	7		201 00	110 110 110 14
100	a LOAM	FRIABLE			Inc	REFUSAL	7"	ASSUMED	BEDROCK
SURFACE (Inches)	9		10YR 3/3		SOIL SURFACE (Inches		8		
EA -					- E				
CIR.	14	-			SURF				
L S			10YR 4/4		LS -				
SOIL					0		2		
1 -	GRAVELLY	FIRM	2.5¥ 4/2			5			
E I									
DEPTH BELOW MINERAL	REFUSAL	21"	ASSUMED	BEDROCK	DEPTH BELOW MINERAL				
2 -					- <				
107		-			0-				
- BE	~				BEI				
E					12-				
EP			-		EP -				
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1 2	0		-		-				
-					- i I				
-						>			
- 3	10								
•	hydric	Slope %	Limiting factor	ground water		hydric	Slope %	Limiting factor	ground water
	non-hydric	0-15	19"	restrictive layer Bedrock		non-hydric	0-15	0"	restrictive layer bedrock
	Soil Series / phase name:			Drainage HSG		Soil Series / phase name:			Drainage HSG
CSS		SADDLEBACK	FSL	EWD C/D	C.S.S.		WONSQUEAK	MUCK	VPD D
								and the second second	
_		ments (as applicable)			Da	11/4/2009	1	-	
P	rofessional Endorser				Li		11.	AE OF M	
P C.S.S	signature:	rea	p						
1	signature		R		1.00	1 1.50%	1/2		A.
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	signature:	rea	R	2		#304	6	A. BREWER	In
1	signature:	rea	R					A. BREWER No. 304	17m
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1	signature:	rea	R	1		1.00		A. BREWER No. 304	AR A
1	signature:	rea	R	2				A. BREWER No. 304	AF ST
1	signature:	rea	R					A. BREWER No. 304	Nr.
1	signature:	rea	R	2.				A. BREWER	ME .

FORM F		0901355
	SOIL PROFILE/CLASSIFICATION INFO for subsurface investigations at DEP Site Lo	
Project Name:	Applicant Name:	Project Location (municipality)
KIBBY EXPANSION CLASS L	TRANSCANADA	KIBBY/CHAIN OF PONDS

1

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1

__5

Exploration Symbol: TP 21

6 Texture SANDY LOAM

Boring

Mottling

L L L L

Exploration Symbol: TP 20

6

Texture SANDY LOAM

SILT LOAM

SANDY

SOIL DESCRIPTION AND CLASSIFICATION

pth of Organic H

VERY FRIABLE

Consistency STONY

x

Test Pit

Color 10YR 4/1

5YR 2.5/2

n Above Mineral Soil

Boring

Mottling 7.5YR 3/3

SOIL DESCRIPTION AND CLASSIFICATION

Depth of Organic H

Consistency

x

n Abo

Test Pit

ve Mineral Soil

Color

2.5¥ 3/2

ľ

	SS	fo			TION INFORMATION DEP Site Location Project	ts	3. 4.S. 5.	1923	12 181
roject Name:		Applicant Name	: SISK WIND F	OWER		Project Location (mi	unicipality)	-	
KIBBY EXPANSI	ON CLASS L		TRAN	SCANADA		KIB	BY, CHAIN OF	PONDS	
SO	IL DESCRIPTION A	ND CLASSIFICATIO	N		SO	IL DESCRIPTION AND	CLASSIFICAT	ON	
Exploration Symbol	: TP 24	X Test Pit	Borin	g	Exploration Symbol	TP 25	X Test Pit		Boring
	" Depth of Organic Hor	izon Above Mineral Sol			5	* Depth of Organic Horizon	Above Mineral Soil		
 Texture 	Consistency	Color	Mottlin	ng	 Texture 	Consistency	Color		Mottling
					T CAN HAVE A MUS	LOOPE	FN/ 375		

0	Texture	Consistency	Color	Mottling	L	Texture LOAMY SAND	Consistency	Color	Mottling
- 1					1.2	1 LOAMY SAND	LOOSE	5Y 3/2	_
-2			BROWN		- 24	2 ORGANIC	MUCK	BLACK	
-		VERY	DROWN		- 10-	5 ORGANIC	MUCK	DLACK	
+		FRIABLE			125	*			_
-		11011010			~-	1			_
-	ORGANIC				es -	7 FINE			
	ORGANIC				(Inches)	SANDY		10YR 4/3	
-	MUCKY					e LOAM	VERY	1018 4/3	
10	PEAT				SURFACE	+ LOAN	FRIABLE		
10	I LAI		-		¥ -	10	FRIADLE		
			-		5 -				_
14						12		2.5Y 4/4	
16					N -	.14		2.51 4/4	
18						10			2020 22
20					X -	18	FIRE		10YR 4/4
\rightarrow					H -	20 SANDY 21 LOAM	FIRM	2.5¥ 5/3	2.5¥ 7/2
-					§ -				
-			DIACH	-	3 -	25			
_			BLACK		8 -				10YR 4/4
30			-		료 -	30	VERY	5Y 5/3	5Y 6/1
_						32	FIRM		
-					DEPTH	34			
-					b _			5Y 5/2	10Y 5/1
_					0_	LIMIT	OF	TEST PIT	10YR 4/4
40					1.2	40			
	LIMIT	OF	TEST	PIT					
60					12	60			
					1.5				
								_	
	hydric	Slope %	Limiting factor	 ground water 		hydric	Slope %	Limiting factor	pround water
	non-hydric	0-15	0"	restrictive layer	×	non-hydric	15-30	16"	 vestcictive layer
1	Not the labor of t		VARIANT	D bedrock	-	1010			D bedrock
:) ¹	Soil Series / phase name			Drainage HSG	CSS	Soil Series / phase name:			Drainage HSG
1		WASKISH	MOD. DEEP	VPD D		/	SURPLUS	SL	SWPD C

_			D CLASSIFICATION		-			ND CLASSIFICATIO	
	Exploration Symbol:		X Test Pit	Boring		Exploration Symbol:	And the local data and the local	X Test Pit	Boring
l		* Depth of Organic Horiz				3	* Depth of Organic Hori		
0	Texture	Consistency	Color	Mottling		o Texture	Consistency	Color	Mottling
1	VERY FINE SANDY LOAM		5YR 5/2 5YK 2.5/1		-	1 VFSL		10YR 5/1 5YR 2.5/1	-
- 2	SANDILOAM		51K 2.5/1	-	S - 5-	2		51K 2.5/1	_
- 4		VERY				4	VERY	5YR 3/2	
5		FRIABLE	10YR 4/4			s LOAM	FRIABLE		-
- 6					15	6			-
7					Inches,	7		7.5YR 3/3	
- 8	LOAM		5YR 2.5/1		(Inc	8			
9		10100 Provide G			8	9			
10	SILT LOAM	FRIABLE	2.5Y 3/2		EAC	10			
12				10YR 4/4	15 -	12			5Y 4/2
16				2.5Y 5/2		17 SANDY	FIRM	2.5Y 4/3	10YR 4/4
18				2501 512	13 -	18 LOAM	TIKM	2.51 9/5	1018 4/4
20						20			-
		FIRM			RA-				
-	SANDY				- NE				
	LOAM		2.5¥ 4/3		DEPTH BELOW MINERAL	26 LIMIT	OF	TEST	PIT
					N				
30					E -	50			
\rightarrow					TB-				
-		·			ti-				
+					E -				
40					-	40			
42					-				
43		VERY FIRM	2.5Y 3/3	7.5YR 3/3	1 7			-	
7	REFUSAL	43"	ASSUMED	BEDROCK	1 -	50			
\pm					-				
	hydria	Slope %	Limiting factor	ground water	•	hydric	Slope %	Limiting factor	D ground water
	non-hydric	0-15	14"	 restrictive layer Bedrock 		non-hydric	15-30	10"	 restrictive layer bedrock
	Soil Series / phase name:	SURPLUS	VARIANT MOD. DEEP	Drainage HSG SWPD C	C.S.S	Soil Series / phase name:	SURPLUS	SL	Drainage HS SWPD C
		SURPLUS	MOD. DEEP	SWPD C		/	SURFLUS	SL	SWPD C

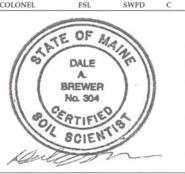
	signature:	hall	Dat	11/4/2009
C.S.S.	name	DALE A. BREWER	Lio	#304



Norm CRAVELY ZOY 4.3 Norm SENDY Norm Norm <th>FORM F</th> <th></th> <th>Contraction of the</th> <th>SOIL PROFILE/CLAS</th> <th></th> <th></th> <th></th> <th></th> <th>090135</th>	FORM F		Contraction of the	SOIL PROFILE/CLAS					090135
NEW PORTANSING CLASS I TRANSCANDA NEW PORTANGE 1000000000000000000000000000000000000	ect Name:	AV. 10-10-54	for Applicant Name:	subsurface investigatio SISK WIND POWER	ns at DEP	Site Location Proje		municipality)	
Column 1		ION CLASS L	representation						NDS
Column 1	50			N	11	50			AL CONTRACTOR OF
1 Open of Construction Resolved Res				and the second s				passa a	
Norm PREARUE Norm PREARUE Norm PREARUE	5	* Depth of Organic Hori	-		11 1	6	* Depth of Organic Horiz		1
Norm PREARUE Norm PREARUE Norm PREARUE		Consistency		Mottling		Texture	Consistency	Color	Mottling
NIT IDVE DI IDVE DI IDVAN IDVA DI IDVA DI IDVA DI IDVA DI IDVAN IDVA DI IDVA DI IDVA DI IDVA DI IDVA DI IDVAN IDVA DI IDVA DI IDVA DI IDVA DI IDVA DI IDVA DI IDVAN IDVA DI IDVAN IDVA DI IDVANDI IDVA DI IDVA DI	2 LOAM		101R 4/2		1				
SILT 1978-01	3				2		FRIABLE	5YR 5/1	
Image: Solution of the second secon	5 SILT		10YR 4/1			LOAM			
Index PRAME JOTE 51 (10000 JOTE 51 (10000 <thjote 51<br="">(100000 <thjote 51<br="">(10000 <thjot< td=""><td>6 LOAM</td><td></td><td></td><td></td><td>es)</td><td></td><td></td><td></td><td></td></thjot<></thjote></thjote>	6 LOAM				es)				
Index PRAME JOTE 51 (10000 JOTE 51 (10000 <thjote 51<br="">(100000 <thjote 51<br="">(10000 <thjot< td=""><td>7</td><td></td><td></td><td></td><td># Inch</td><td>COARSE</td><td></td><td></td><td></td></thjot<></thjote></thjote>	7				# Inch	COARSE			
Image: Construction of the second s							FIRM	2.5YR 4/2	
Image: Construction of the second s	to 12 LOAM	FRIABLE	2.5Y 4/2	10YK 4/4	RFA 21 0	SAND			
Image: Structury in the structury						REFUSAL	12"	ASSUMED	BEDROCK
Characterization Consistency Construction Constructi	10 7A			-	7100				
Image: Source in the second	20 GRAVELLY		2.5Y 4.3						
Image: Source in the second		-	-		- VEH				
Image: Source in the second		FIRM			W 25				
Image: Source in the second	30				NO NO				
Image: Source in the second	LIMIT	OF	TEST	PIT	1 BE				
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Image: Solution of the set of phase news Image: Solution of the set of the se	40								
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No. 304 / //		ation Symbol: 	TP 34 ¹ Depth of Organic Horize Consistency VERY FRIABLE FRIABLE 28" 28" 28" 28" 28" 28" 28" 28" 28" 28"	Test Pit 2.5Y 4/2 ASSUMED Limiting factor 0" MUCK	Boring Mottling Mottling Boring Mottling Boring Mottling Boring Boring Boring Boring Boring Boring Boring Boring B	a a DEPTH BELOW MINERAL SOIL SUPFACE S 3 a a b b b b b b b b b b b b b b b b b b	Exploration Symbol: 3 Texture LOAM SILT LOAM REFUSAL 	TP 35 * Depth of Organic Horiz Consistency VERY FRIABLE FRIABLE S'' S'' S'' ABRAM	Test Pit Tes	Boring Mottling BEDROCK BEDROCK
6 CERTIFIE 4	c c	ation Symbol: 	TP 34 ¹ Depth of Organic Horize Consistency VERY FRIABLE FRIABLE 28" 28" 28" 28" 28" 28" 28" 28" 28" 28"	Test Pit 2.5Y 4/2 ASSUMED Limiting factor 0" MUCK	Boring Mottling Mottling Boring Mottling Boring Mottling Boring Boring Boring Boring Boring Boring Boring Boring B	a a DEPTH BELOW MINERAL SOIL SUPFACE S 3 a a b b b b b b b b b b b b b b b b b b	Exploration Symbol: 3 Texture LOAM SILT LOAM REFUSAL 	TP 35 * Depth of Organic Horiz Consistency VERY FRIABLE FRIABLE S'' S'' S'' ABRAM	Test Pit Test Pit Test Pit Test Pit Test Pit SYR 2.5/1 SYR 3/4 TOYR 5/1 ASSUMED	Boring Mottling BEDROCK BEDROCK
O CATIFIE S		ation Symbol: 	TP 34 ¹ Depth of Organic Horize Consistency VERY FRIABLE FRIABLE 28" 28" 28" 28" 28" 28" 28" 28" 28" 28"	Test Pit 2.5Y 4/2 ASSUMED Limiting factor 0" MUCK	Boring Mottling Mottling Boring Mottling Boring Mottling Boring Boring Boring Boring Boring Boring Boring Boring B	a a DEPTH BELOW MINERAL SOIL SUPFACE S 3 a a b b b b b b b b b b b b b b b b b b	Exploration Symbol: 3 Texture LOAM SILT LOAM REFUSAL 	TP 35 Depth of Organic Horu Consistency VERY FRIABLE FRIABLE S'' Sicen % 0-15 ABRAM	Test Pit Tes	Boring Mottling BEDROCK BEDROCK
		ation Symbol: 	TP 34 ¹ Depth of Organic Horize Consistency VERY FRIABLE FRIABLE 28" 28" 28" 28" 28" 28" 28" 28" 28" 28"	Test Pit 2.5Y 4/2 ASSUMED Limiting factor 0" MUCK	Boring Mottling Mottling Boring Mottling Boring Mottling Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Bor	a a DEPTH BELOW MINERAL SOIL SUPFACE S 3 a a b b b b b b b b b b b b b b b b b b	Exploration Symbol: 3 Texture LOAM SILT LOAM REFUSAL 	TP 35 Depth of Organic Horu Consistency VERY FRIABLE FRIABLE S'' Sicen % 0-15 ABRAM	Test Pit Tes	Boring Mottling BEDROCK BEDROCK
		ation Symbol: 	TP 34 ¹ Depth of Organic Horize Consistency VERY FRIABLE FRIABLE 28" 28" 28" 28" 28" 28" 28" 28" 28" 28"	Test Pit 2.5Y 4/2 ASSUMED Limiting factor 0" MUCK	Boring Mottling Mottling Boring Mottling Boring Mottling Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Bor	a a DEPTH BELOW MINERAL SOIL SUPFACE S 3 a a b b b b b b b b b b b b b b b b b b	Exploration Symbol: 3 Texture LOAM SILT LOAM REFUSAL 	TP 35 Depth of Organic Horu Consistency VERY FRIABLE FRIABLE S'' Sicen % 0-15 ABRAM	Test Pit Tes	Boring Mottling BEDROCK BEDROCK
8CIEN 2	Constant of the second se	ation Symbol: 	TP 34 ¹ Depth of Organic Horize Consistency VERY FRIABLE FRIABLE 28" 28" 28" 28" 28" 28" 28" 28" 28" 28"	Test Pit 2.5Y 4/2 ASSUMED Limiting factor 0" MUCK	Boring Mottling Mottling Boring Mottling Boring Mottling Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Bor	a a DEPTH BELOW MINERAL SOIL SUPFACE S 3 a a b b b b b b b b b b b b b b b b b b	Exploration Symbol: 3 Texture LOAM SILT LOAM REFUSAL 	TP 35 Depth of Organic Horu Consistency VERY FRIABLE FRIABLE S'' Sicen % 0-15 ABRAM	Test Pit Tes	Boring Mottling BEDROCK BEDROCK
	R R Sol Series Sol Series	ation Symbol: 	TP 34 ¹ Depth of Organic Horize Consistency VERY FRIABLE FRIABLE 28" 28" 28" 28" 28" 28" 28" 28" 28" 28"	Test Pit 2.5Y 4/2 ASSUMED Limiting factor 0" MUCK	Boring Mottling Mottling Boring Mottling Boring Mottling Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Bor	a a DEPTH BELOW MINERAL SOIL SUPFACE S 3 a a b b b b b b b b b b b b b b b b b b	Exploration Symbol: 3 Texture LOAM SILT LOAM REFUSAL 	TP 35 Depth of Organic Horu Consistency VERY FRIABLE FRIABLE S'' Sicen % 0-15 ABRAM	Test Pit Tes	Boring Mottling BEDROCK BEDROCK
	R hyx ron-h Sol Serie	ation Symbol: 	TP 34 ¹ Depth of Organic Horize Consistency VERY FRIABLE FRIABLE 28" 28" 28" 28" 28" 28" 28" 28" 28" 28"	Test Pit 2.5Y 4/2 ASSUMED Limiting factor 0" MUCK	Boring Mottling Mottling Boring Mottling Boring Mottling Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Bor	a a DEPTH BELOW MINERAL SOIL SUPFACE S 3 a a b b b b b b b b b b b b b b b b b b	Exploration Symbol: 3 Texture LOAM SILT LOAM REFUSAL 	TP 35 Depth of Organic Horu Consistency VERY FRIABLE FRIABLE S'' Sicen % 0-15 ABRAM	Test Pit Tes	Bering Mottling BEDROCK BEDROCK
Harlow	R hyx ron-h Sol Serie	ation Symbol: 	TP 34 ¹ Depth of Organic Horize Consistency VERY FRIABLE FRIABLE 28" 28" 28" 28" 28" 28" 28" 28" 28" 28"	Test Pit 2.5Y 4/2 ASSUMED Limiting factor 0" MUCK	Boring Mottling Mottling Boring Mottling Boring Mottling Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Bor	a a DEPTH BELOW MINERAL SOIL SUPFACE S 3 a a b b b b b b b b b b b b b b b b b b	Exploration Symbol: 3 Texture LOAM SILT LOAM REFUSAL 	TP 35 Depth of Organic Horu Consistency VERY FRIABLE FRIABLE S'' Sicen % 0-15 ABRAM	Test Pit Test Pit Test Pit Test Pit Test Pit SYR 2.5/1 SYR 3/4 TOYR 5/1 ASSUMED	Boring Mottling BEDROCK BEDROCK



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Pr	ofessional En	dorsements (as applicable)	and the second	
	signature	han 2	Dat	11/4/2009
	name:	DALE A. BREWER	Lio	#304

siope %	Limiting factor	ground water restrictive tayer bedruck
/ phase name: COLONEL	FSL	Orainage HSG SWPD C
SOIL DESCRIPTION		
on Symbol: TP 39	X Test Pit	Boring
3 * Depth of Organic Ho	orizon Above Mineral Soll	
xture Consistency	Color	Mottling
	10YR 5/1	
	IGIKOT	
INE		-
NDY FRIABLE		
DAM	2.5Y 4/1	
		5Y 6/1
NDY VERY		10YR 4/4
DAM FIRM	2.5Y 5/3	
MIT OF	TEST	PIT
		_
		-
	-	
Slope %	Limiting factor	ground water
	8"	restrictive layer bedrock
/ phase name: COLONEL	FSL	Drainage HSG SWPD C

	Exploration Symbo	ol: TP 36	X Test Pit	Boring		Exploration Symbol	: TP 37	X Test Pit	Boring
h	8	* Depth of Organic Horiz	ton Above Mineral Soil		11	4	* Depth of Organic Horiz	on Above Mineral Soil	
	Texture	Consistency	Color	Mottling	H	Texture	Consistency	Color	Mottling
. 1						SANDY			
2			2.5Y 5/1		1 =	2 LOAM		7.5YR 5/1	
4						4		7.5YR 3/3	
5	VERY				11 2	5			
. 6	FINE				(S)	6	FRIABLE		
.7	SANDY				19	7 FINE			
8	LOAM	VERY	10YR 4/4		(Inches)	a SANDY		10YR 3/3	
.0		FRIABLE				9 LOAM			
10					1 8 T	0			
12						t			
14					SURFACE	Z			
16						> VERY	1		
18			2.5Y 4/2		SOIL	4 FINE		2.5Y 4/3	
20	LOAM					5 SANDY			
22		FIRM	2.5Y 4/4	5Y 5/2	E T	6 LOAM			5Y 6/1
24				10YR 3/3	127	GRAVELLY		2.5¥ 5/4	
26	LIMIT	OF	TEST	PIT	1 2 7	FINE	FIRM		
-					13-	SANDY			
30					197	4 LOAM			
					1 HE	LIMIT	OF	TEST	PIT
+					DEPTH BELOW MINERAL				
+					DE				_
40					1 2	10			
60		-				0			
					1 -				
_	hydric non-hydric	Slope %	Limiting factor	ground water restrictive layer	0	hydric non-hydric	Slope %	Limiting factor	ground wate nethrctive layer
	nut-riyane	15-30		restrictive layer bedrock	117	hanknyana	15-30		restrictive layer bedrock

ojec	KIBBY EXPANSIO	ON CLASS L		TRANSCANA	DA		K	IBBY/CHAIN OF PO	ONDS
	201	L DESCRIPTION AN		1		84	DIL DESCRIPTION AN		
	Exploration Symbol:		X Test Pit	Boring		Exploration Symbol		X Test Pit	Boring
	6	* Depth of Organic Horiz		<u> </u>	11	_5	* Depth of Organic Horizo		L
0	Texture	Consistency	Color	Mottling		Texture	Consistency	Color	Mottling
1	VERY	FRIABLE	7.5YR 5/1 5YR 2.5/1	-	1	SANDY			
3	FINE	TRATOLE	U A AC BRITA	-		LOAM		10YR 5/1	
- 4	SANDY		5YR 2.5/2		4				
5	LOAM	FRIABLE			5		-		
7		FRIADLE		7.5YR 3/3	105)		FRIABLE		
	LOAM		10YR 3/4	OXYAQUIC	(Inches,	GRAVELLY		2.5Y 4/3	
9				CONDITION	E ·	SANDY			
10				7.5YR 3/3	SURFACE	LOAM			
14		FIRM	5Y 4/2	5Y 6/1	SUR			2.5Y 4/4	5Y 2/2
-16	LOAM				710				2.5Y 5/6
18	REFUSAL	16"	ASSUMED	BEDROCK	TIOS	LIMIT	OF	TEST	PIT
20					RAL 8				
					INE				
_					W 25				
30					DEPTH BELOW MINERAL				
					BEI				
					E				
					DEF				
40			-						-
1									
60					-60				
			-		1 -				-
-		-			11 -				
	hydric	Slope %	Limiting factor	ground water		hydric	Slope %	Limiting factor	ground wat
	non-hydric	0-15	6''	C restrictive layer		non-hydric	30-40	12"	D restrictive lay
t	Soil Series / phase name			Drainage HSG		Soil Series / phase name	h:		Drainage H
1		SADDLEBACK	FSL	WD C/D	CSS	8	SADDLEBACK	FSL	WD C
_	801	L DESCRIPTION AN			1	60	DIL DESCRIPTION AN	ID CLASSIFICATIO	N
_	301	L DESCRIPTION AN		press,				X Test Pit	Boring
	Exploration Symbol	TP 42	V Toot Pit	Boring		Evoloration Symbol			
	Exploration Symbol:		X Test Pit	Boring		Exploration Symbol			
0	4	* Depth of Organic Horize	on Above Mineral Soil			18	* Depth of Organic Horizo	on Above Mineral Soil	
0				Mottling					Mottling
0 1 2 2	4 Texture GRV F SL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling		18	* Depth of Organic Horizo	on Above Mineral Soil	
0 1 2 3 4	4 Texture	* Depth of Organic Horiza	on Above Mineral Soil Color		0 - 	18	* Depth of Organic Horizo	on Above Mineral Soil	
0 1 2 3 4 5	4 Texture GRV F SL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	0 1 2 3 4 5	18 Texture SANDY	* Depth of Organic Horizo	on Above Mineral Soil	
0 1 2 3 4 5 5 7	4 Texture GRV F SL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling		 Texture	* Depth of Organic Horizo Consistency	on Above Mineral Soil Color	
0 1 2 3 4 5 6 7 8	4 Texture GRV F SL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling		18 Texture SANDY	* Depth of Organic Horizo Consistency	on Above Mineral Soil Color	
0 1 2 3 4 5 6 7 8 9	4 Texture GRVFSL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	(Inches) == 2 = = = = = = = = = = = = = = = = =	18 Texture SANDY	* Depth of Organic Horizo Consistency	on Above Mineral Soil Color	
0 1 2 3 4 5 6 7 8 9 10	4 Texture GRVFSL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	(Inches) == 2 = = = = = = = = = = = = = = = = =	18 Texture SANDY	* Depth of Organic Horizo Consistency	on Above Mineral Soil Color	
0 1 2 3 4 5 5 7 8 9 10 12 14	 Texture GRVFSL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	(Inches) == 2 = = = = = = = = = = = = = = = = =	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14 16	 Texture GRV F SL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	SURFACE (Inches) = = = = = = = = = = = = = = = = = = =	18 Texture SANDY	* Depth of Organic Horizo Consistency	on Above Mineral Soil Color	Mottling
14	 Texture GRV F SL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	SURFACE (Inches)	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14	 Texture GRV F SL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	L SOIL SURFACE (inches) 2 宮 コ 声 コ こ	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14	 Texture GRV F SL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	L SOIL SURFACE (inches) 2 宮 コ 声 コ こ	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14 16	 Texture GRV F SL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	L SOIL SURFACE (inches) 2 宮 コ 声 コ こ	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14 16 18 20	 Texture GRV F SL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	L SOIL SURFACE (inches) 2 宮 コ 声 コ こ	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14 16 18 20	 Texture GRV F SL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	L SOIL SURFACE (inches) 2 宮 コ 声 コ こ	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14 16 18 20	 Texture GRV F SL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	L SOIL SURFACE (inches) 2 宮 コ 声 コ こ	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14	 Texture GRV F SL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	L SOIL SURFACE (inches) 2 宮 コ 声 コ こ	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14 16 18 20 30	 Texture GRVFSL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	DEPTH BELOW MINERAL SOIL SURFACE (Inches) Image:	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14 16 18 20 30 40	 Texture GRVFSL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	L SOIL SURFACE (inches) 2 宮 コ 声 コ こ	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14 16 18 20 30	 Texture GRVFSL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	DEPTH BELOW MINERAL SOIL SURFACE (Inches) 1 1 2 1 1 0	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14 18 20 30 40 58	 Texture GRVFSL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	DEPTH BELOW MINERAL SOIL SURFACE (Inches) Image:	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14 18 20 30 40 58	 Texture GRVFSL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling	DEPTH BELOW MINERAL SOIL SURFACE (Inches) 1 1 2 1 1 0	18 Texture SANDY LOAM	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling
14 18 20 30 40 58	 Texture GRVFSL REFUSAL	* Depth of Organic Horize Consistency FIRM	on Above Mineral Soil Color 7.5YR 5/1	Mottling BEDROCK	■ DEPTH BELOW MINERAL SOIL SURFACE (Inches)	18 Texture SANDY LOAM REFUSAL	* Depth of Organic Horize Consistency FIRM	2.5¥ 4/4	Mottling Mottling BEDROCI
14 16 18 20 30 40 58		* Depth of Organic Horizon Consistency FIRM 2"	Assumed Association of the second sec	Mottling BEDROCK	DEPTH BELOW MINERAL SOIL SURFACE (Inches) 0	18 Texture SANDY LOAM REFUSAL	* Depth of Organic Horizo Consistency FIRM I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	ASSUMED	Motting Motting BEDROC
14 16 18 20 30 40 58 90	 Texture GRVFSL REFUSAL	* Depth of Organic Horizon Consistency FIRM 2" 	n Above Mineral Sol Color 7.5YR 5/1 ASSUMED	Mottling BEDROCK BEDROCK	DEPTH BELOW MINERAL SOIL SURFACE (Inches) 18 18 8 18	18 Texture SANDY LOAM REFUSAL	* Depth of Organic Horizon Consistency FIRM 12" 12"	ASSUMED	Mottling Mottling BEDROCI
14 16 18 20 30 40 58 90	 Texture GRVFSL REFUSAL	* Depth of Organic Horizon Consistency FIRM 2" 	Above Mineral Sol Color 7.5YR 5/1 ASSUMED	Mottling BEDROCK	□ DEPTH BELOW MINERAL SOIL SURFACE (Inches) □ 8 8 9 9 0 0	18 Texture SANDY LOAM REFUSAL	* Depth of Organic Horizo Consistency FIRM FIRM 12" 12" 12" Stope % 0-15	n Above Mneral Sol Color	Mottling Mottling BEDROCI
14 16 18 20 30 40 50 50	 Texture GRVFSL REFUSAL	* Depth of Organic Horizon Consistency FIRM 2" 	n Above Mineral Sol Color 7.5YR 5/1 ASSUMED	Mottling BEDROCK BEDROCK	De DEPTH BELOW MINERAL SOIL SURFACE (Inches) 8 8 8 1 8 1 1 1 0	18 Texture SANDY LOAM REFUSAL REFUSAL	* Depth of Organic Horizo Consistency FIRM FIRM 12" 12" 12" 12" 12" 12" 12" 12" 12" 12"	ASSUMED	Mottling Mottling BEDROCI
16 18 20 30 40 58 90	 Texture GRVFSL REFUSAL	* Depth of Organic Horizon Consistency FIRM 2" 	on Above Mineral Sol Color 7.5YR 5/1 ASSUMED ASSUMED Limiting factor 2" PEAT	Mottling BEDROCK BEDROCK	□ DEPTH BELOW MINERAL SOIL SURFACE (Inches) □ 8 8 9 9 0 0	18 Texture SANDY LOAM REFUSAL	* Depth of Organic Horizo Consistency FIRM FIRM 12" 12" 12" 12" 12" 12" 12" 12" 12" 12"	ASSUMED	Mottling Mottling BEDROCI
14 16 18 20 30 40 58 90	 Texture GRVFSL REFUSAL	* Depth of Organic Horizon Consistency FIRM 2" Signe % 30-40 RICKER	on Above Mineral Sol Color 7.5YR 5/1 ASSUMED ASSUMED Limiting factor 2" PEAT	Mottling BEDROCK BEDROCK	DEPTH BELOW MINERAL SOIL SURFACE (Inches) 8 8 8 1 1 1 1 0	18 Texture SANDY LOAM REFUSAL REFUSAL	* Depth of Organic Horizo Consistency FIRM FIRM 12" 12" 12" 12" 12" 12" 12" 12" 12" 12"	ASSUMED	Mottling Mottling BEDROCT BEDR

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ect	Name:	ONCLASSE	Applicant Name:	TRANCCAN			Project Location (CANTRO .
-	KIBBY EXPANSI	ON CLASS L		TRANSCAN	ADA		K	IBBY/CHAIN OF PO	ONDS
-		L DESCRIPTION AN		proved in the second se			IL DESCRIPTION A		
L.	Exploration Symbol		X Test Pit	Boring	41	Exploration Symbol		X Test Pit	Boring
h	8 Texture	* Depth of Organic Horizo Consistency	Color	Mottling		5 Texture	* Depth of Organic Horiz Consistency	Color	Mottling
3	TEATUTE		COUCH	wrottaing			Consistency		wonnig
2		FRIABLE	7.5YR 5/1		2	SANDY LOAM	FRIABLE	7.5YR 5/1	_
4	GRAVELLY		710718 012			LOAM	TRIADEL	7.5YR 2.5/3	-
5	SANDY				5				
6	LOAM		5YR 2.5/2		(sau	REFUSAL	5"	ASSUMED	BEDROC
9					(Inches,				
0				-					
12		FIRM	10YR 3/6		SURFACE = = = = =	(-
14									
16 18	REFUSAL	14"	ASSUMED	BEDROCK	TIOS				-
20									
+					DEPTH BELOW MINERAL				
+					VIW 25				-
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30					BEL(-	-
+				2	HE-				-
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60				3	60				
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	hydric non-hydric	Slope %	Limiting factor	ground weber restrictive layer		hydric non-hydric	Slope %	Limiting factor	D ground wat
	non-nyana	30-40	9"	restrictive layer bedrock	11.	non-nyane	0-15		restrictive lay bedrock
S	ioil Series / phase name		FSL	Drainage HSG WD C/D	CSS	Soil Series / phase name		DEAT	Drainage H
		SADDLEBACK	PSL	WD C/D			RICKER	PEAT	EWD
_									
	SOI	L DESCRIPTION AN	D CLASSIFICATION	4		so	IL DESCRIPTION A	ND CLASSIFICATIO	N
E	SOI Exploration Symbol		D CLASSIFICATION	N Boring		SC Exploration Symbol	and the second se	ND CLASSIFICATIO	Boring
E	Exploration Symbol: 12''		X Test Pit			Exploration Symbol	and the second se	X Test Pit	
E	Exploration Symbol 12" Texture	TP 46 * Depth of Organic Horize Consistency	x Test Pit	Boring Mottling		Exploration Symbol	TP 47	X Test Pit	
0 1 2	Exploration Symbol: 12''	TP 46 * Depth of Organic Horize	X Test Pit	Boring		Exploration Symbol	TP 47	on Above Mineral Soil	Boring
0 1 1 1 1	Exploration Symbol 12" Texture	TP 46 * Depth of Organic Horize Consistency	x Test Pit	Boring Mottling		Exploration Symbol <u>18</u> Texture	TP 47	Test Pit on Above Mineral Sol	Boring Mottling
0 1 2 3 4	Exploration Symbol 12" Texture	TP 46 * Depth of Organic Horize Consistency	x Test Pit	Boring Mottling		Exploration Symbol <u>18</u> Texture GRAVELLY	* Depth of Organic Horiz Consistency	Test Pit on Above Mineral Sol	Boring Mottling 2.5Y 4/3 5Y 5/1
0 1 2 3 4 5 6	Exploration Symbol 12" Texture	TP 46 * Depth of Organic Horize Consistency	x Test Pit	Boring Mottling	s)	Exploration Symbol <u>18</u> Texture	TP 47	Test Pit on Above Mineral Sol	Boring Mottling 2.5Y 4/3 5Y 5/1
0 1 2 3 4 5 6 7	Exploration Symbol 12" Texture	TP 46 * Depth of Organic Horize Consistency	x Test Pit	Boring Mottling	ches)	Exploration Symbol 18 Texture GRAVELLY SANDY	* Depth of Organic Horiz Consistency	X Test Pit on Above Mineral Sol Color 10YR 3/4	Boring Mottling 2.5Y 4/3 5Y 5/1
01234567	Exploration Symbol 12" Texture	TP 46 * Depth of Organic Horize Consistency	x Test Pit	Boring Mottling	; (Inches) = 2 = 2 = 0 = 1 = 2 = 2	Exploration Symbol 18 Texture GRAVELLY SANDY	* Depth of Organic Horiz Consistency	X Test Pit on Above Mineral Sol Color 10YR 3/4	Boring Mottling 2.5Y 4/3 5Y 5/1
0 1 2 3 4 5 6 7 8 9 10	Exploration Symbol 12" Texture	TP 46 * Depth of Organic Horize Consistency	x Test Pit	Boring Mottling	ACE (Inches)	Exploration Symbol 18 Texture GRAVELLY SANDY	TP 47 * Depth of Organic Horiz Consistency FIRM	X Test Pit on Above Mineral Sol Color 10YR 3/4 7.5YR 3/4	Boring Mottling 2.5Y 4/3 5Y 5/1
0 1 2 3 4 5 6 7 3 9 10 12	Exploration Symbol 12" Texture	TP 46 * Depth of Organic Horize Consistency	x Test Pit	Boring Mottling	JHFACE (Inches)	Exploration Symbol 18 Texture GRAVELLY SANDY	* Depth of Organic Horiz Consistency	X Test Pit on Above Mineral Sol Color 10YR 3/4	Boring Mottling 2.5Y 4/3 5Y 5/1 7.5YR 4/4
0 1 2 3 4 5 6 7 8 9 10 12 14	Exploration Symbol 12" Texture	TP 46 * Depth of Organic Horize Consistency	x Test Pit	Boring Mottling	SURF/	Exploration Symbol 18 Texture GRAVELLY SANDY LOAM	TP 47 * Depth of Organic Horiz Consistency FIRM	X Test Pit on Above Mineral Sol Color 10YR 3/4 7.5YR 3/4	Boring Mottling 2.5Y 4/3 5Y 5/1 7.5YR 4/4
0 1 2 3 4 5 6 7 3 9 10 12	Exploration Symbol 12" Texture	TP 46 * Depth of Organic Horize Consistency	x Test Pit	Boring Mottling	SOIL SURFACE (Inches)	Exploration Symbol 18 Texture GRAVELLY SANDY LOAM	TP 47 * Depth of Organic Horiz Consistency FIRM	X Test Pit on Above Mineral Sol Color 10YR 3/4 7.5YR 3/4	Boring Mottling 2.5Y 4/3 5Y 5/1 7.5YR 4/4
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Projec	t Name: KIBBY EXPANSIO	ON CLASS I	Applicant Name:	TRANSCA!				Project Location (r	nunicipality) IBBY/CHAIN OF PO	NDS
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	SOI	L DESCRIPTION AN						IL DESCRIPTION AM	and the second se	N
	Exploration Symbol:		X Test Pit	Boring		1	Exploration Symbol	TP 49	X Test Pit	Boring
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3	LOAM-					3				
4	SANDY	FIRM	7.5YR 3/3			4			10YR 3/3	
5	LOAM- REFUSAL	5"	ASSUMED	BEDROCK	-1-	3	LOAM	FRIABLE		
105	REFUSAL	5	ASSUMED	BEDROCK	SURFACE (Inches)	- 6	LOAM		7.5YR 2.5/2	-
SURFACE (inches)					- Inct	- 0			710 11 210/2	-
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40			-		-1-	40				
_										
60				2	-11 -	60				
-				-	-1-	+				
					-11	+				
0	hydric	Slope %	Limiting factor	ground water	0	-	hydric	Slope %	Limiting factor	D ground water
	non-hydric	0-15	3"	 restrictive layer 			non-hydric	0-15	10"	D restrictive layer
-	Soil Series / phase name			Drainage HSG	-1-1	1	Soil Series / phase name			B bedrock Drainage HSG
css	Sol Selles / prase name.	RICKER	PEAT	EWD A	C.S.S	s)	Sol Senes / prase name	SADDLEBACK	FSL	WD C/D
,						,				12 1 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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	Exploration Symbol:	TP 50	X Test Pit	Boring		-	Exploration Symbol	TP 51	X Test Pit	Boring
	14	* Depth of Organic Horiz	on Above Mineral Soil				11	* Depth of Organic Horizo	on Above Mineral Soil	
0	Texture	Consistency FRIABLE	Color 2.5Y 3/3	Mottling		0	Texture	Consistency V FRIABLE	Color	Mottling
1	STONY	FRIABLE	2.5¥ 3/3		-11 -	1	VFSL REFUSAL	V FRIABLE	10YR 5/2 ASSUMED	BEDROCK
	SANDY			-	-11	- 1	KEPUSAL	*	ASSOMED	DEDROCK
4	LOAM	FIRM	-		-11	4				
5			5Y 3/2			5				
es)					es)	6				
to -					(Inches,	7				
SURFACE (Inches)	REFUSAL	8"	ASSUMED	BEDROCK	- E.					
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40					-11-	40				
58				-	11					
- 90	1				-11 -	50				
- 90	0		-		-11 -	+		-		
	hydric	Slope %	Limiting factor	ground water	0		hydric	Siope %	Limiting factor	ground water
۵	non-hydric		0"	D restrictive layer			non-hydric	15-30	1"	restrictive layer
h	Soil Series / phase name:			Drainage HSG		1	Soil Series / phase name			Drainage HSG
S.S.		WONSQUEAK	VARIANT	VPD D	C.S.S	1		RICKER	PEAT	EWD A
	1									
Pro		ments (as applicable)	5.5500	-	Ded.	11/4/2009	· /	-	
C.S.S.	signature: name:	DALE A. BREWI	in the second se			Dat	#304		AE OF M	//
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ect Name:			subsurface investigatio SISK WIND POWER		N INFORMATION Site Location Proje	cts Project Location (r	municipality)	
KIBBY EXPANSI	ON CLASS L		TRANSCANA	DA		K	IBBY/CHAIN OF PO	NDS
50	IL DESCRIPTION AN	D CLASSIFICATION	J	11	SC	DIL DESCRIPTION A		N
Exploration Symbo		X Test Pit	Boring		Exploration Symbol		X Test Pit	Boring
3	* Depth of Organic Horizo			41 F	_5	* Depth of Organic Horizi		
o Texture	Consistency	Color	Mottling		Texture	Consistency	Color	Mottling
1		10YR 4/1				Contractor (
2				2		FRIABLE	10YR 5/1	
4 LOAMY	FRIABLE	7.5YR 3/1				FRIADLE		
SAND	FRIADLE	7.51K 5/1			VERY	-	-	
5				6 8	FINE		7.5YR 2.5/1	
7				1 che	SANDY			
B SANDY LOAM	FIRM	7.5YR 2.5/1		SURFACE (inches)	LOAM			
U LOAM	FIRM			ACE a				
12 SANDY		7.5YR 4/4	2.5Y 4/3	12		FRIABLE	7.5YR 3/2	-
13 LOAM			5Y 5/1	112				7.5YK 3/4
14 REFUSAL	13"	ASSUMED	BEDROCK	15				OXYAQUI
16				0S 10	SANDY LOAM		2.5¥ 4/4	
14				ERAL 2 2	LOAM		2.51 4/4	
				1 J 24			1	-
				DEPTH BELOW MINERAL	REFUSAL	24"	ASSUMED	BEDROCK
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30				8 BELO				
				12-				
				Id -			-	
				113 -				
40				40				
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60				60		-		
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hydric	Slope %	Limiting factor	ground water	0	hydric	Slope %	Limiting factor	ground wate
non-hydrid	0-15	7"	 restrictive toyer 		non-hydric	0-15	24"	D restrictive layer
10.10			D bedick		oil Series / phase name			bedtock
Soil Series / phase name	SADDLEBACK	FSL	Drainage HSG WD C/D	CSS	oi Senes / phase name	SADDLEBACK	FSL	Drainage HS WD C
				- <u> </u>				
SANDY LOAM					Texture	Consistency	Color	Mottling
2 3 4 CHANERY	FRIABLE	2.5Y 4/1		7 2 3 4	VERY FINE SANDY LOAM LOAM	VERY FRIABLE	7.5YR 4/1 5YK 2.5/1	
5 SANDY	FRIABLE	5YR 2.5/1		1 2 3 4 5	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
s SANDY e LOAM	FRIABLE			1 2 3 4 6 7 7 9 9 7	VERY FINE SANDY LOAM	VERY FRIABLE	7.5YR 4/1 5YK 2.5/1	
5 SANDY 6 LOAM 7	FRIABLE			(inches) = 2 0 0 + 1 1 1 - 1	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
5 SANDY 6 LOAM 7 8				CE (Inches)	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
5 SANDY 6 LOAM 7 8 9 10	THIXOTROPIC	5YR 2.5/1		IFACE (inches)	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
5 SANDY 6 LOAM 7 8 9 10				≥URFACE (Inches)	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
5 SANDY 6 LOAM 7 8 9 10	THIXOTROPIC	5YR 2.5/1		SURF	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
5 SANDY 6 LOAM 7 8 9 10 11 13 15 15	THIXOTROPIC FIRM	5YR 2.5/1 5YR 3/4		12 17	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
5 SANDY 6 LOAM 7 8 9 10 11 13 15 15	THIXOTROPIC	5YR 2.5/1 5YR 3/4 2.5Y 4/4		12 17	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
5 SANDY 6 LOAM 7 8 9 10 11 12 13 15 16 16	THIXOTROPIC FIRM	5YR 2.5/1 5YR 3/4		12 17	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
s SANDY c LOAM z LOAM s s s s very fine s SANDY s very fine s SANDY	THIXOTROPIC FIRM	5YR 2.5/1 5YR 3/4 2.5Y 4/4	BEDROCK	12 17	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
s SANDY c LOAM LOAM b c c c c c c c c c c c c c	THIXOTROPIC FIRM FRIABLE	5YR 2.5/1 5YR 3/4 2.5Y 4/4 5Y 4/3	BEDROCK	12 17	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
6 SANDY 6 LOAM 7 8 9 10 11 13 15 15 15 15 20 VERY FINE 22 SANDY 24 LOAM	THIXOTROPIC FIRM FRIABLE	5YR 2.5/1 5YR 3/4 2.5Y 4/4 5Y 4/3	BEDROCK	12 17	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
s SANDY c LOAM LOAM b c c c c c c c c c c c c c	THIXOTROPIC FIRM FRIABLE	5YR 2.5/1 5YR 3/4 2.5Y 4/4 5Y 4/3	BEDROCK	12 17	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
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6 SANDY 6 LOAM 7 8 9 10 11 15 15 15 16 10 10 10 10 11 15 15 16 10 10 10 10 10 10 10 10 10 10	THIXOTROPIC FIRM FRIABLE	5YR 2.5/1 5YR 3/4 2.5Y 4/4 5Y 4/3	BEDROCK	12 17	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
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6 SANDY 6 LOAM 7 8 9 10 11 15 15 15 16 10 10 10 10 11 15 15 16 10 10 10 10 10 10 10 10 10 10	THIXOTROPIC FIRM FRIABLE	5YR 2.5/1 5YR 3/4 2.5Y 4/4 5Y 4/3	BEDROCK	12 17	VERY FINE SANDY LOAM LOAM	VERY FRIABLE FRIABLE	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3	
6 SANDY 6 LOAM 7 8 9 10 11 12 15 15 15 15 15 15 15 15 15 15	THIXOTROPIC FIRM FRIABLE 24"	5YR 2.5/1 5YR 3/4 2.5Y 4/4 5Y 4/3 ASSUMED		DEPTH BELOW MINERAL SOIL 8 8 5	VERY FINE SANDY LOAM LOAM REFUSAL	VERY FRIABLE 5"	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3 ASSUMED	BEDROCK
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6 SANDY 6 LOAM 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	THIXOTROPIC FIRM FRIABLE 24" Stope % 0-15	5YR 2.5/1 5YR 3/4 2.5Y 4/4 5Y 4/3 ASSUMED	D ground witter D instructions layer B Bedrock	■ □ DEPTH BELOW MINERAL SOIL	VERY FINE SANDY LOAM LOAM REFUSAL	VERY FRIABLE 5"	7.5YR 4/1 5YR 2.5/1 7.5YR 2.5/3 ASSUMED	BEDROCK
s SANDY c LOAM c LOA	THIXOTROPIC FIRM FRIABLE 24" Skope % 0-15 SADDLEBACK	5YR 2.5/1 5YR 3/4 2.5Y 4/4 5Y 4/3 ASSUMED Limiting factor 	ground water ground water unatrictive styler Bedrock Drainage HSG	■ □ DEPTH BELOW MINERAL SOIL	VERY FINE SANDY LOAM LOAM REFUSAL	VERY FRIABLE 5"	7.5YR 4/1 7.5YR 2.5/3 7.5YR 2.5/3 ASSUMED 	BEDROCK
s SANDY c LOAM c LOA	THIXOTROPIC FIRM FRIABLE 24" 24" Skope % 0-15 SADDLEBACK	5YR 2.5/1 5YR 3/4 2.5Y 4/4 5Y 4/3 ASSUMED Limiting factor 	ground water ground water unatrictive styler Bedrock Drainage HSG		VERY FINE SANDY LOAM LOAM REFUSAL	VERY FRIABLE 5"	7.5YR 4/1 7.5YR 2.5/3 7.5YR 2.5/3 ASSUMED 	BEDROCH
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Exploration Symbol: TP S Test Pit Boring		COLONEL	FSL	SWPD C	0.5.5	NG 20	COLONEL	FSL	SWPD
Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution of Cognition Horizon Allower Mineral Solution Image: Solution of Cognition Horizon Allower Mineral Solution Of Cognition Allower Mineral Solution of Cognition Allower Mineral Solution Of Cognition Allower Mineral Solution Allower Mineral Solution Of Cognition Allower Mineral Solution		SOIL DESCRIPTION A	and the second se	generating				present.	_
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VERY FIRE SANDY 7.5YR 51 SINDY 7.5YR 51 53NDY 53NDY 7.5YR 40 SANDY 7.5YR 30 50AM 53NDY 7.5YR 40 SANDY 10YR 34 53NDY 2.5Y 403 2.5Y 403 SANDY 10YR 34 53NDY 2.5Y 403 2.5Y 403 SANDY 10YR 34 53NDY 2.5Y 403 2.5Y 403 COBBLY 7.5YR 402 53ND 7.5YR 402 7.5YR 402 COBBLY 7.5YR 402 54ND 10Y 57.1 2.5Y 403 LOAM 2.5Y 403 2.5Y 403 2.5Y 403 2.5Y 403 COBBLY 2.5Y 403 10Y 57.1 10Y 57.1 10Y 57.1 LOAM 2.5Y 403 10Y 57.1 10Y 57.1 10Y 57.1 LOAM 2.5Y 403 10Y 57.1 10Y 57.1 10Y 57.1 LOAM 2.5Y 403 10Y 57.1 10Y 57.1 10Y 57.1 LOAM 10AM 2.5Y 403 10Y 57.1 10Y 57.1 LIMIT OF 15.00		the second se	Color	Mottling		And and a second	and the second se		Mottling
VERY PRIABLE 7.5YR 2.52 FINE 7.5YR 3/3 IOAM FIRM SANDY 7.5YR 3/3 IOAM FIRM SANDY 10YR 3/4 IOAMY 2.5Y 4/3 2.5Y 5/2 SANDY 10YR 3/4 IOAMY 2.5Y 4/3 2.5Y 5/2 SANDY 10YR 3/4 IOAMY 2.5Y 4/3 2.5Y 4/3 IOAM FIRM 2.5Y 4/3 2.5Y 4/3 2.5Y 4/3 COBBLY 7.5YR 4/4 2.5Y 5/2 FIRM 10Y 5/1 10Y 5/1 GRAVELLY 5ANDY 10Y 5/1 10Y 5/1 10Y 5/1 10Y 5/1 SANDY 10AM 2.5Y 4/3 10Y 5/1 10Y 5/1 10Y 5/1 GRAVELLY 5ANDY 10Y 5/1 10Y 5/1 10Y 5/1 10Y 5/1 IOAM 2.5Y 4/3 10Y 5/1 10Y 5/1 10Y 5/1 10Y 5/1 10Y 5/1 IOAM 2.5Y 4/3 10Y 5/1	1		5YR 2.5/2	-				5Y 3/2	2.5Y 4/3
SANDY 7.5YR 3/3				_			FIDM		
FRIABLE LOAMY 2.5Y 4/3 2.5Y 5/2 SANDY 10YR 3/4 5AND VERY 10YS 1 2.5Y 4/3 LOAM 2.5Y 4/3 2.5Y 4/3 2.5Y 4/3 2.5Y 4/3 COBELY 75YR 4/2 5AND VERY 10YS 1 2.5Y 4/3 COBELY 75YR 4/2 2.5Y 3/2 FIRM 12" ASSUMED BEDROCI COBELY 75YR 4/2 2.5Y 4/3 2.5Y 4/3 12" ASSUMED BEDROCI COBELY FIRM 2.5Y 4/3 2.5Y 4/3 2.5Y 4/3 10" 10" 10" 10" COBELY FIRM 2.5Y 4/3 2.5Y 4/3 2.5Y 4/3 10" <t< td=""><td>s SANDY</td><td></td><td>7.5YR 3/3</td><td></td><td></td><td>LOAM</td><td>FIRM</td><td></td><td></td></t<>	s SANDY		7.5YR 3/3			LOAM	FIRM		
SANDY 10YR 3/4 2.5Y 4/3 IDAM 7.5YR 4/2 9 9 10Y 5/1 FIRM 2.5Y 4/4 2.5Y 4/4 2.5Y 4/3 12" ASSUMED BEDROCT COBBLY FIRM 2.5Y 4/3 2 12" ASSUMED BEDROCT COBBLY FIRM 2.5Y 4/3 2.5Y 4/3 12" ASSUMED BEDROCT COBBLY FIRM 2.5Y 4/3 2.5Y 4/3 12" ASSUMED BEDROCT SANDY 2.5Y 4/3 10" 12" ASSUMED BEDROCT SANDY 2.5Y 4/3 10" 10	6 LOAM	FRIABLE			les)			2.5Y 4/3	
LOAM VERY 10Y 5/1 Image: Comparison of the second of the	0 CANDY		10VD 2/4						2.57 4/2
Image: Signed State rame 2.5Y 4/4 2.5Y 5/2 COBBLY FIRM Image: State rame Image: State rame VERY Image: State rame Image: State rame IMIT OF TEST PIT Image: State rame Image: State rame Image: State rame Colonel FSL Sol Berles / phase rame Image: MSG Sol Berles / phase			10YR 3/4		al e			10Y 5/1	2.51 4/3
Image: Signed State rame 2.5Y 4/4 2.5Y 5/2 COBBLY FIRM Image: State rame Image: State rame VERY Image: State rame Image: State rame IMIT OF TEST PIT Image: State rame Image: State rame Image: State rame Colonel FSL Sol Berles / phase rame Image: MSG Sol Berles / phase	5			7.5YR 4/2				ASSUMED	BEDROC
COBBLY CANA Cobstant Cobstant <td>0</td> <td>FIDM</td> <td>2.5Y 4/4</td> <td></td> <td>13 17</td> <td></td> <td></td> <td></td> <td></td>	0	FIDM	2.5Y 4/4		13 17				
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LIMIT OF TEST PIT Image: Notice in the image in the		Y		-	NER.				
LIMIT OF TEST PIT Image: Notice in the image in the	8 LOAM		2.5Y 4/3	-	I W N				
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LIMIT OF TEST PIT Image: Notice in the image in the	6				1				
Image: Nydric Slope %, Limiting factor Image: Nydric hydric 15:40 15** Image: Nydric soil Series / phase name: Drainage HSG COLONEL FSL SWPD Soil Series / phase name: Drainage COLONEL FSL Swyp: C Data 11/4/2009 Interview name: DALE A. BREWER	0								
hydric Stope % Limiting factor geset were non-hydric 15-30 15" geset were Soll Series / phase name: Dariange HSG COLONEL FSL Dariange Solgenture: Dariange Dariange Ofessional Endorsements (as applicable) Dat signature: Dat 11/4/2009 name: DALE A. BREWER Dat	LIMIT	OF	TEST	PIT					
non-hydric 15-30 15" non-hydric 0-15 0" non-hydric Soll Series / phase name: COLONEL FSL SwPD C C Soll Series / phase name: Drainage					50				
non-hydric 15-30 15" non-hydric 0-15 0" non-hydric Soll Series / phase name: COLONEL FSL SwPD C C Soll Series / phase name: Drainage									
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COLONEL FSL SWPD C CSS PEACHAM MUCK VPD I ofessional Endorsements (as appl(cable) signature: DALE A. BREWER Dat 11/4/2009 name: DALE A. BREWER Dat ENDORSE DATE OF AMAIN Lie #304			15	D Bedrock			0+15		and the second sec
(BREWER No. 304	Jou Jenes / phase		FSL		C.S.S.	oon ooneer prese name.	PEACHAM	MUCK	
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(BREWER No. 304	signature:	AL	12-2-				1	TE OF M	/
(BREWER No. 304	name:	DALE A, BREW	EI		Lid	#304	114	A	1
BREWER No. 304							1/2	DALE	161
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01 111 6								Come?	1211
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FORM F

09013SS

t Name:		Applicant Name:	SISK WIND POWER		Site Location Project	Project Location (n		
KIBBY EXPANSI	ION CLASS L		TRANSCANA	DA		KI	IBBY/CHAIN OF PO	NDS
SO	IL DESCRIPTION AN	D CLASSIFICATION	N		SO	L DESCRIPTION AN	D CLASSIFICATION	4
Exploration Symbo	1: TP 60	X Test Pit	Boring		Exploration Symbol:	TP 61	X Test Pit	Boring
8	* Depth of Organic Horizo				_4	* Depth of Organic Horizo		
Texture	Consistency	Color	Mottling	-	Texture GRAVELLY	Consistency	Color	Mottling
SILT	VERY	10YR 3/1		2	FINE	FIRM	7.5YR 5/1	
LOAM	FRIABLE		5Y 5/2	-	SADY LOAM REFUSAL	4"	OBSERVED	BEDROC
SANDY	FRIABLE	2.5Y 4/1		5	ALL COLLE		COULT LD	DEDROC
LOAM	VERY	2.5Y 3/2	10YR 4/4	es)				
	FIRM	2.31 3/2	5Y 5/2	(Inches				
LIMIT	OF	TEST	PIT	- U				
	-		-	SURFACE []]]]] =				-
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hydric	Slope %	Limiting factor	ground water	0	hydria	Slope %	Limiting factor	D ground wat
non-hydric	0-15	3"	D restrictive tayer D bedrock	-	non-hydric	15-30	4**	restrictive lays bedrock
Soil Series / phase nam	0	MUCK	Drainage HSG	CSS	Soil Series / phase name:		100-004	Drainage H
	PEACHAM	VARIANT	VPD D			RICKER	PEAT	EWD
SO	IL DESCRIPTION AN	DCLASSIFICATION	N		SO	L DESCRIPTION AN	D CLASSIFICATION	4
Exploration Symbo	I: TP 62	X Test Pit	Boring		Exploration Symbol:	TP 63	X Test Pit	Boring
	* Depth of Organic Horizo				24	* Depth of Organic Horizo	the state of the state of the local data and the state of	
Texture	Consistency	Color	Mottling		Texture	Consistency	Color	Mottling
	-							
				2				
					MOD			
					MOD DECOMPOSED			
				- 2 3 4 5 6 2		VERV		
				(incres)	DECOMPOSED	VERY FRIABLE	BLACK	
				CE (inches)	DECOMPOSED		BLACK	
	WETLAND			RFACE (Inches)	DECOMPOSED ORGANICS		BLACK	
	WETLAND			- 11	DECOMPOSED ORGANICS		BLACK	
	WETLAND			-1 17	DECOMPOSED ORGANICS WELL		BLACK	
	WETLAND			TIOS	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS		BLACK	
	WETLAND			TIOS	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS		BLACK	
	WETLAND			TIOS	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS		BLACK	BEDROC
	WETLAND			TIOS	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS	FRIABLE		BEDROC
	WETLAND			TIOS	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS	FRIABLE		BEDROC
	WETLAND			TIOS	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS	FRIABLE		BEDROC
	WETLAND			OW MINERAL SOIL	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS	FRIABLE		BEDROC
	WETLAND			TIOS	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS	FRIABLE		BEDROC
	WETLAND			DEPTH BELOW MINERAL SOIL 8 2 8 8 5 5 5	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS	FRIABLE		BEDROC
	WETLAND			DEPTH BELOW MINERAL SOIL 8 2 8 8 5 5 5	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS	FRIABLE		BEDROC
	WETLAND			DEPTH BELOW MINERAL SOIL 8 1 2 2 2	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS	FRIABLE		BEDROCI
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hydric nov-hydric		Liming factor	ground wider ground wider ground wider ground wider ground wider	DEPTH BELOW MINERAL SOIL 8 1 8 1 2 8 8 2 2	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS REFUSAL	24"	ASSUMED	ground wate
non-hydric	Slope %	Liming factor	restrictive layer		DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS REFUSAL	24" 24" Siope % 	ASSUMED	ground wat ground wat or restriction lays bedrock
non-hydric	Slope %	Limiting factor	restrictive layer Bedrock	□ ■ DEPTH BELOW MINERAL SOIL	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS REFUSAL	Slope %	ASSUMED	ground wate ground wate ground wate or restrictions tays Drainage HS
non-hydric Soil Series / phase nam	Slope %		restrictive layer Bedrock	□ ■ DEPTH BELOW MINERAL SOIL	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS REFUSAL	Slope % 	ASSUMED Limiting factor 	groond wate groond wa
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hydric non-hydric Soll Series / phase nam	Stope %		restrictive layer Bedrock	20 ■ ■ DEPTH BELOW MINERAL SOIL	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS REFUSAL hydric non-hydric Soll Series / phase name:	Slope % 	ASSUMED Limiting factor 	groond wate groond wa
hydric non-hydric Soil Series / phase nam ofessional Endorse signature.	Sicpe %		restrictive layer Bedrock	© □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS REFUSAL hydric non-hydric Soll Series / phase name:	Slope % 	ASSUMED	groond wate groond wa
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non-hydric Soil Series / phase nam ofessional Endorse signature:	Sicpe %		restrictive layer Bedrock	© □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS REFUSAL hydric non-hydric Soll Series / phase name:	24"	ASSUMED ASSUMED Umiting factor O" VARIANT MOD. DEEP TE OF MA BREWER No. 304	ground wate ground wa
non-hydric Soil Series / phase nam ofessional Endorse signature:	Sicpe %		restrictive layer Bedrock	© □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS REFUSAL hydric non-hydric Soll Series / phase name:	24"	ASSUMED ASSUMED Umiting factor O" VARIANT MOD. DEEP TE OF MA BREWER No. 304	a restrictive laye a bedrock Drainage HS VPD I
non-hydric Soil Series / phase nam ofessional Endorse signature:	Sicpe %		restrictive layer Bedrock	© □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	DECOMPOSED ORGANICS WELL DECOMPOSED ORGANICS REFUSAL hydric non-hydric Soll Series / phase name:	Slope % 	ASSUMED ASSUMED Umiting factor O" VARIANT MOD. DEEP TE OF MA BREWER No. 304	ground wate ground wa

	JUM P			SOIL PROFILE/CLAS				Carl Street	0901333
Proje	ct Name:		for :	subsurface investigation SISK WIND POWER	ns at DE	P Site Location Proje	Project Location (municipality)	
110/0	KIBBY EXPANSIO	ON CLASS L	rippilount Humer	TRANSCAN/				IBBY/CHAIN OF PC	NDS
-	Exploration Symbol:	TP 64	X Test Pit	Boring		Exploration Symbo		ND CLASSIFICATION	Boring
	5	* Depth of Organic Horizo		L boing	-11	3	* Depth of Organic Horiz		
- 3	Texture	Consistency	Color	Mottling	1	Texture	Consistency	Color	Mottling
- 2	VERY STONY				- 1	1 FSL	VERY	7.5YR 4/1	-
-	LOAMY		7.5YR 5/2		- 1	3	FRIABLE	5YR 2.5/1	
	SAND				1 -	4		5YR 3/2	
-	GRAVELLY				-	6 VERY		518 3/2	
(Inches,	VERY	FRIABLE	5YR 2.5/1		- thes	7 FINE	FRIABLE	7.5YR 3/3	
	FINE SANDY LOAM	THIXOTROPIC			<u> </u>	8 SANDY 0 LOAM		10YR 4/4	
SURFACE		THINGTHOTIC		-	SURFACE (Inches)	10			
JAF			7.5YR 2.5/2	-	LIRF	12	VERY	2.5Y 4/3	7 EVD 4/6
					T SI	14	FIRM	2.51 4/3	7.5YR 4/6 2.5YR 6/1
SOIL -	SANDY LOAM	FIRM	10YR 4/3			18			OXYAQUIC
	REFUSAL	17"	ASSUMED	BEDROCK		20 REFUSAL	18"	ASSUMED	BEDROCK
-					NEF				
W N					N.V.	25			
107					- [0] -	io oi			
BE					BE				
DEPTH BELOW MINERAL					DEPTH BELOW MINERAL	-			
DE					DE				
4						40			
						50			
					11 -				
-					-11 -				
0	hydric	Slope %	Limiting factor	D ground water	0	hydric	Slope %	Limiting factor	ground water
	non-hydric	0-15	16**	 restrictive layer 		non-hydric	0-15	9"	 restrictive layer
1	Soil Series / phase name			Drainage HSG		Soil Series / phase name			Drainage HSG
CSS		SADDLEBACK	FSL	WD C/D	C.S.S.	1	SADDLEBACK	FSL	WD C/D
_	2011	L DESCRIPTION AN		4	-	50	DI DESCRIPTION A	ND CLASSIFICATIO	N
	Exploration Symbol:		X Test Pit	Boring		Exploration Symbo		X Test Pit	Boring
	5	* Depth of Organic Horize			-11	4	* Depth of Organic Horiz		
- 3	Texture	Consistency	Color	Mottling	1i	Texture	Consistency	Color	Mottling
			7.5YR 5/1		- 11	GRAVELLY SANDY		7.5YR 5/1	
	CHANNERY			-	- 11	3 LOAM		7.51K 5/1	
1	SANDY		5YR 2.5/1			4			
	LOAM	THIXOTROPIC		-		5	FRIABLE	7.5YR 2.5/2	
(Inches)	7	FRIABLE	7.5YR 2.5/3		(Inches)	7	TRADEC	7.074 4.6.076	
	1				18	8 SANDY			
ACE				-	- QE	9 LOAM			-
HH I	VERY FINE		10YR 3/4			12		10YR 3/3	
			10YR 3/6	-	SU	14			
SOIL =	7		1011 3/0		- SOIL	15			7.5YR 2.5/1
		VERY	2.5Y 4/2	7.5YR 3/3	- F	GRAVELLY	VERY	2.5Y 4/3	OXYAQUIC
DEPTH BELOW MINERAL	2	FIRM	2.5Y 4/3	OXYAQUIC	VER	21 SANDY 22 LOAM	FIRM		
MIN -	REFUSAL	22"	ASSUMED	BEDROCK	DEPTH BELOW MINERAL	REFUSAL	22"	ASSUMED	BEDROCK
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BEL	1				- BEL				
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-					- 1				
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-	-						-		-
	200								
	barleis	Ciona W	Limiting factor		0	hadrin	Slope %	Limiting factor	ground water
	hydric non-hydric	Slope %	and the second sec	ground water restrictive layer		hydric non-hydric	30-40		ground water restrictive layer
-	1.5			Bedrock				 VARIANT	D bedtock
css	Soil Series / phase name	ENCHANTED	FSL	Drainage HSG WD C/D	CSS	Soil Series / phase name	SURPLUS	SL	Drainage HSG MWD C
Pr	ofessional Endorse	ments (as applicable)		10	1.11/1/2000			
C.S.S	signature: name:	DALE A. BREWE	12		0.			TE OF M	
	name.	DALL A. DALHI				1150%	1/4	DALE	12
							1/9	DALE	101
							1 11 1	A.) //
								BREWER	1 11
								No. 304	/ //
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FORM F

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ect	Name:			SOIL PROFILE/CLAS subsurface investigatio SISK WIND POWER				Project Location (nunicipality)	用作的方用
	KIBBY EXPANSIO	ON CLASS L		TRANSCANA	DA				IBBY/CHAIN OF PC	ONDS
_	SOIL	DESCRIPTION AN	D CLASSIFICATIO	N	TT		SO	IL DESCRIPTION A	ND CLASSIFICATIO	N
1	Exploration Symbol:		X Test Pit	Boring	1	Expl	oration Symbol		X Test Pit	Boring
	6	* Depth of Organic Horiz		1				* Depth of Organic Horiz	the second se	
1	Texture	Consistency	Color	Mottling	11 -	0 t	Texture FINE	Consistency	Color 7.5YR 4/1	Mottling
2	GRAVELLY		7.5YR 4/2		11 :	2 S/	ANDY LOAM	-	7.5YR 5/1	_
4	SANDY					4		FRIABLE	5YR 2.5/1	
8	LOAM		7.5YR 2.5/2	_		5	SANDY LOAM		5YR 2.5/2	
7			THE REAL		(Inches,	7	LOTUT	Ĩ	10YR 4/4	
8	SANDY		7.5YR 3/3	_	ui) :	8	GRAVELLY	VERY		10YR 4/4
10	LOAM	FRIABLE			SURFACE	10	FINE	FIRM	2.5Y 4/2	OXYAQUIO
12	FINE SANDY LOAM	· · · · · · · · · · · · · · · · · · ·	10YR 3/6		En -	12 5/	LIMIT	OF	TEST	PIT
15				2.5Y 5/6	STIOS	15				
17	VERY		5Y 4/3			18				
1	FINE SANDY				ERA					
+	LOAM				NIN.	25				
18	REFUSAL	28"	ASSUMED	BEDROCK	BELOW MINERAL	_		-		
~	REPUSAL	20	ASSEMLD	DEDROCK	BEL	30				
Ŧ				-	DEPTH					-
t					DE					
0					- 11	40				
10					11 :	60				
+					-					
İ										
	hydric non-hydric	Slope %	Limiting factor	ground water			hydric n-hydric	Slope %	Limiting factor	ground wate restitctive layer
-				D bedrock			100 2000 A	0-15	8"	D bedrock
	Soil Series / phase name:	SURPLUS	VARIANT SL	Drainage HSG SWPD C	G.S.S	Soils	ieries / phase name	SURPLUS	VARIANT SL	Drainage H5 SWPD C
				123 173		<u></u>			-	1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 - 1944 -
T	Exploration Symbol:	DESCRIPTION AN	X Test Pit	Boring		Expl	oration Symbol	TP 71	X Test Pit	Boring
f	3	* Depth of Organic Horiz		Doning	11	L-op	3	* Depth of Organic Horiz		
•	Texture	Consistency	Color	Mottling	Ц.	0	Texture	Consistency VRY FRIABLE	Color	Mottling
2	SANDY LOAM		7.5YR 5/1		1 >	2	SILI LOAM	VKIFKIABLE	10YR 2/1	-
3			5YR 2.5/1		11 :	3	LOAM		10YR 3/2	
4 5			5YR 2.5/2	-	1.	5	LOAM		101R 3/2 10YR 3/4	
0	FINE SANDY	FRIABLE			es)	6		FRIABLE		
8	LOAM	FRIADLE	10YR 3/4		(Inches)	8		TRIADLE		5Y 4/2
9						9				
2			2.5Y 4/4		SURFACE	12	SILT LOAM		2.5Y 3/3	2.5Y 4/1
4	GRAVELLY			2.5¥ 5/6		14				10YR 3/3
18	FINE	VERY	2.5Y 4/3		SOIL	18				
20	SANDY LOAM	FIRM		-	BAL	20	REFUSAL	18"	ASSUMED	BEDROCK
t	REFUSAL	22"	ASSUMED	BEDROCK	INE					
+					W.W	-				
0					ELO	30				
ł					DEPTH BELOW MINERAL					-
ţ					EPT	1				
0					11-	40	_			
t					11 :					
a					1	50				
0					11 -	-				
1	hydric	Slope %	Limiting factor	D ground weber			hydric	Slope %	Limiting factor	ground water
	non-hydric	0-15	15"	restrictive layer Bedrock	•	no	n-hydric	15-30	8"	D restrictive layer
5	Soil Series / phase name:			Drainage HSG	C.S.S	Soll S	eries / phase name		VARIANT	Drainage HS
1		SADDLEBACK	FSL	WD C/D		/		SURPLUS	SL	SWPD C
	fessional Endorser	nents (as applicable	9)			1.2.2		1 3		
5.H-	signature: name:	DALE A. BREWE	R			Dat	11/4/2009 #304		TE OF M	1.
									DALE A BREWER No. 304	
								60	RTIFIE BOIENT	5

FORM F

09013SS

Projec	t Name:	NICLACE.		ubsurface investigation SISK WIND POWER		DEP S	ite Location Proje	Project Location (m		NIDC
	KIBBY EXPANSIO			TRANSCANAL	DA				BBY/CHAIN OF PO	
		DESCRIPTION ANI		proved in the second se		T		IL DESCRIPTION AN	provide a second	
	Exploration Symbol:	* Depth of Organic Horizo	X Test Pit	Boring		E	xploration Symbol	* Depth of Organic Horizor	X Test Pit	Boring
	Texture	Consistency	Color	Mottling		0	4 Texture	Consistency	Color	Mottling
1	VERY STONY					1	FINE			
-	SANDY LOAM	FIRM	7.5YR 4/1			2	SANDY LOAM	FRIABLE	7.5YR 5/1	
-						4	GRV. VFSL		5YR 2.5/1	
10 -	FINE SANDY LOAM	THIXOTROPIC	5YR 2.5/1		(3	5	GRAVELLY			
ches			7.5YR 2.5/3		(Inches)	2	LOAM	THIXOTROPIC	5YR 2.5/2	
10	STONY FINE	VERY	7.5YR 3/3			8				
AC	SANDYLOAM	FIRM			SURFACE	10				
SURF		10"	ASSUMED	BEDROCK	UBI	12				
11 5					S DIL S	15				
AL SC						18	SANDY LOAM	FRIABLE	2.5Y 4/4	
DEPTH BELOW MINERAL SOIL SURFACE (Inches)					DEPTH BELOW MINERAL	22			2	
NIN					NIN	24			2.5Y 4/3	7.5YR 3/3,2.5Y 4/2 OXYAQUIC
IMC					M	28	REFUSAL	26"	ASSUMED	BEDROCK
3EL(3EL(90				
H					THE	+		1		
EP					DEP	1				
					1	40				
_						1				
						60				
_						-				
0	hydric	Slope %	Limiting factor	D ground water			hydric	Slope %	Limiting factor	ground water
	non-hydric	15-30	10"	C restrictive layer			non-hydric	15-30	22"	D rectrictive layer
-	Soil Series / phase name:			tednock Drainage HSG		S	oil Series / phase name			Drainage HSG
C.S.S.		SADDLEBACK	FSL	WD C/D	C.S.S	s /	<u> </u>	SADDLEBACK	FSL	WD C/D
_	SOIL	DESCRIPTION ANI	CLASSIFICATION				SC	IL DESCRIPTION AN	DCLASSIFICATION	v —
	Exploration Symbol:		X Test Pit	Boring		E	xploration Symbol		X Test Pit	Boring
		* Depth of Organic Horizo	n Above Mineral Soil			E	3	* Depth of Organic Horizor	n Above Mineral Soil	
	Texture	Consistency	Color	Mottling		0	Texture STONY	Consistency	Color	Mottling
						2	SANDY	FRIABLE	10YR 5/1	
-						3	LOAM	THIXOTROPIC	5YR 2.5/1	
-						5		FRIABLE	518 2.5/1	
(es)	MODERATELY DECOMPOSED				(sə	6	VERY FINE			
Inch	ORGANICS	FRIABLE	BLACK		(Inches)	8	SANDY		7.5YR 3/3	
E CE						9	LOAM	FRIABLE		
BFAC					SURFACE	10			7.5YR 3/4	
SUI						14	LOAM			
= =					SOIL	16 18	SANDY	-	10YR 3/4	
AL S					AL	20	LOAM	FIRM	2.5Y 4/4	
NER.					NER	+	REFUSAL	20"	POSSIBLE	BEDROCK
W 20	WELL	FIDM	10/0 0/1	2.5Y 4/1	DEPTH BELOW MINER	1				
S S	DECOMPOSED ORGANICS	FIRM	10YR 2/1		TON	30				
1 BE	REFUSAL	30"	ASSUMED	BEDROCK	1 BE	-				
tLd:					tL d	+				
					DE	+				
40						40				
58						+				
- 90						50				
		1				1		6		
	hydric non-hydric	Slope % 0-15	Limiting factor	ground water restrictive layer			hydric non-hydric	Slope % 0-15	Limiting factor 18"	ground water restrictive layer
css	Soil Series / phase name:		LIKE	D Bedrock Drainage HSG	C.S.5	s	ol Series / phase name			Drainage HSG
1		WASKISH	VARIANT	VPD D	0.0.0	1		SURPLUS	VARIANT	WD C
	ofessional Endorser			East of Inco	1	Dat	11/4/2009		TE OF MA	
C.S.S.	signature: name:	DALE A. BREWE	R		-	Lic	#304		TE OF M	
								15		2
								1111	DALE A.	1.11
									BREWER	1 11

SOIL PROFILE/CLASSIFICATION INFORMATION

FORM F

09013SS

No. 304 CEATIFIED OIL SCIENT

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1		VERY	10YR 5/1		-	VERY	VERY		
		FRIABLE	5YR 2.5/1	-		FINE SANDY	FRIABLE	10YR 6/1	
-			DIR LOT			LOAM			
	FINE	FRIABLE	7.5YR 2.5/3		_5		THIXOTROPIC VERY FRIABLE	2.5YR 2.5/1	
hes)	SANDY		7.518 4.5/3		(Inches)		VERIFRIADLE		
DEPTH BELOW MINERAL SOIL SURFACE (Inches)	LOAM				(Inc	LOAM		5YR 2.5/2	
ACE		VERY	7.5YR 3/3		a dCE		VERY FRIABLE		
RFA 22		FRIABLE	7.518 5/5		SURFACE z z z e		TRIABLE	7.5YR 3/4	
SUI =			A 202 174		Ins				
2011		FIRM	2.5Y 4/4	10YR 4/4,2.5Y 6/2	SOIL 2 a	ROCK FRAGMENTS		10YR 4/4	
S 78	LOAM	VRY FIRM	10YR 4/3	OXYAQUIC			FRIABLE	2.5Y 4/4	
ER	REFUSAL	20"	ASSUMED	BEDROCK	ER				A #5/ #1/
NIN -					DEPTH BELOW MINERAL	LOAM	VERY	2.5¥ 4/2	2.5Y 5/6 7.5YR 3/3
MO					A 28		FIRM		
ELC					ELC				
HB-					HB-	FINE		2.5Y 4/1	
EPT					EPT	SANDY			
- D					0	LOAM			
-40					40				
60					60	LIMIT	OF	TEST	PIT
_					_		ASSUMED	BEDROCK	
-					-		·		
0	hydric	Slope %	Limiting factor	ground water	D	hydric	Slope %	Limiting factor	ground water
•	non-hydric	0-15	12"	restrictive layer bedrock		non-hydric	0-15	22"	iestrictive layer bedrock
C.S.S.	Soil Series / phase name:			Drainage HSG	CSS	Soil Series / phase name:		CHANNERY	Drainage HSG
0.00		SADDLEBACK	FSL	WD C/D	6.50		ENCHANTED	VFSL	WD B
-	SOIL	DESCRIPTION AND	DCLASSIFICATION			SO	L DESCRIPTION AN	ID CLASSIFICATION	
	Exploration Symbol:		X Test Pit	Boring		Exploration Symbol:		X Test Pit	Boring
	3	* Depth of Organic Horizo	n Above Mineral Soil			6	* Depth of Organic Horizo	n Above Mineral Soil	
	Texture	Consistency	Color	Mottling	0	Texture	Consistency	Color	Mottling
	GRAVELLY				1	SILT	-	10YR 2/2	
-	FINE	FIRM	10YR 6/1			Lorin		1011111	
	SANDY				-		VERY		
	LOAM BROKEN	STONE	WEATHERED	ROCK		VERY FINE	FRIABLE	10YR 4/1	
thes,	BROKEN	STONE	MEATHERED	ROCK	(Inches) = ~ ~	SANDY			
(inc					(inc	LOAM			
ACE					40E		1	2.5¥ 3/4	5Y 5/1
DEPTH BELOW MINERAL SOIL SURFACE (Inches)					SURFACE		FRIABLE		7.5YR 3/3
USU =						FINE SANDY LOAM		2.5¥ 4/3	7.5YR3/3
= =					SOIL 2 2		16"	ASSUMED	BEDROCK
341 5									
ERI					DEPTH BELOW MINERAL				
NIN -					NW -				
MO					MO				
EL					ELC				
HB-					HB				
EP					EP				
40					40				
58									
								-	
					-				
٥	hydrid	Slope %	Limiting factor	ground water		hydric	Slope %	Limiting factor	 ground water
•	non-hydric	0-15	5"	restrictive layer Bedrock	•	non-hydric	0-15	0	restrictive layer bedrock
CSS	Soil Series / phase name:			Drainage HSG	CSS.	Soil Series / phase name:			Drainage HSG
1		RICKER	PEAT	EWD A			WONSQUEAK	MUCK	VPD D
Pr	ofessional Endorse	ments (as applicable)	1	A STATE	1				
C.S.S.	signature:	ne	22		Dat	11/4/2009	//	TE OF MA	
	name:	DALE A. BREWE	R		Lic	#304	1/28	The MA	
								DALE A. BREWER No. 304	
							80	SCIENT	5
							Aller	april 1	

 SOIL PROFILE/CLASSIFICATION INFORMATION

 for subsurface investigations at DEP Site Location Projects

 Applicant Name:
 SISK WIND POWER
 Project Location (municipality)

 TRANSCANADA
 KIBBY/CHAIN OF PONDS
 FORM F 0901355 Project Name KIBBY EXPANSION CLASS L

Exploration Symbol: TP 77

3

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SOIL DESCRIPTION AND CLASSIFICATION

Consistancy

X Test Pit

n Above Mineral So

Color

T

Boring

SOIL DESCRIPTION AND CLASSIFICATION

x

Test Pit

Color

on Above Mineral Soi

Boring

Mottling

Exploration Symbol: TP 76

3

D

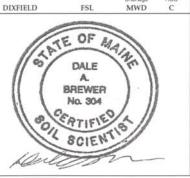
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FU	PIM F			SOIL PROFILE/CLASS	SIFICA	TIO	N INFORMATION	2012/2012/2017	State Constant	0901335
Projec	t Name:	12. 13. 13 A.S.	for s	subsurface investigation SISK WIND POWER	ns at D	EP	Site Location Project	ts Project Location (r	nunicipality)	
Fiojec	KIBBY EXPANSIO	ON CLASS L	Applicant nume.	TRANSCANA	DA	_			IBBY/CHAIN OF PC	ONDS
			D CLASSIFICATION	4		_	200	L DESCRIPTION AN		N
	Exploration Symbol:		X Test Pit	Boring			Exploration Symbol:		X Test Pit	Boring
	3	* Depth of Organic Horiz			11	ł	4	* Depth of Organic Horizo		
0	Texture	Consistency	Color	Mottling	п.	0	Texture	Consistency FRIABLE	Color	Mottling
1	VERY FINE	VERY	7.5YR 6/1 5YR 2.5/1	-		1	VFSL RUFUSAL	FRIABLE T"	10YR 5/1 ASSUMED	BEDROCK
	SANDY	FRIABLE	7.5YR 3/4	-	1	3	ROPUSAL	1	ASSUMED	BEDROCK
4	LOAM				11 :	4				
-	FSL REFUSAL	FRIABLE 5"	10YR 4/4 ASSUMED	BEDROCK		5				
SURFACE (Inches)	REFUSAL		ASSOMED	DEDROCK	SURFACE (Inches)	7				
(Imc					(juc	8				
ACE 10					Ю.	0 10				
RFA 22					BFA .	12				
INS 14					SUL	14				
E III					- j -	15				
S 71				-	IT S	20				
DEPTH BELOW MINERAL SOIL					DEPTH BELOW MINERAL SOIL					
NIN -					NW.	25				
3-					IZ.	-				
ELC 8					12.	30				
H B					18.	-				
Lda					Ld3	-				
-					a i					
40				-		40				
60					11 :	60				
					41 -	-				
0	hydric	Slope %	Limiting factor	D ground water	0	-	hydric	Slope %	Limiting factor	D ground water
	non-hydric	0-15	5"	D restrictive layer			non-hydric	0-15	1"	restrictive layer
	Soil Series / phase name			tedrock Drainage HSG		1	Soil Series / phase name:			bedrock Drainage HSG
C.S.S.		SADDLEBACK	FSL	WD C/D	C.S.S	1		RICKER	PEAT	EWD A
_	801		D CLASSIFICATION		1	_	03	L DESCRIPTION AN		M
	Exploration Symbol:		X Test Pit	Boring	11-		Exploration Symbol:		X Test Pit	Boring
	Exploration Symbol.	* Depth of Organic Horiz	-	L Boning	11		5	* Depth of Organic Horizo		
	Texture	Consistency	Color	Mottling	ti –		Texture	Consistency	Color	Mottling
1					11 :	1				
2						9	GRAVELLY			
- 4	MODERATELY				11	- 3	FINE	VERY	7.5YR 6/1	
	DECOMPOSED				11 :	5	SANDY	FRIABLE		
es)	ORGANICS				es)	6	LOAM			
SURFACE (Inches)					(Inches)	7				
<u>н</u> 9					E H	9	FINE		7.5YR 2.5/2	
RFAC	<u>}</u>	FRIABLE	BLACK		SURFACE	10	SANDY LOAM REFUSAL	FRIABLE 10"	ASSUMED	BEDROCK
SUR 12			DLACK		- 5.	14	REFUSAL	10	ASSEMED	DEDROCK
11 5					OITS	17				
0S 18	WELL				SC.	18				
PIAL 02	DECOMPOSED ORGANICS				BAL	20				
INE					I SI					
N N					N.	_				
107			-		ġ.	30				
BE					BE					
DEPTH BELOW MINERAL SOIL	REFUSAL	34"	ASSUMED	BEDROCK	DEPTH BELOW MINERAL S	+				
DE	ALL COAL		Abounce	DEDROCK	B	1				
40						40				
- 58					- I -	+				
				-	11	50				
90					11 :					
	hydric	Slope %	Limiting factor	ground water	-		hydric	Siope %	Limiting factor	D ground water
	non-hydric	0-15	0"	D restrictive layer			non-tiydric	30-40	10"	restrictive layer
-	0.10		LIKE	D Bedrock		t	Col Corios (obres or ma	00.40		bedrock Drainage HSG
CSS	Sol Series / phase name	WASKISH	VARIANT	Drainage HSG VPD D	CSS	•)	Soil Series / phase name:	SADDLEBACK	FSL	Drainage HSG WD C/D
<u> </u>						-		I		A112
Pro		ments (as applicable	e)				11/4/2009		-	
C.S.S.	signature: name:	DALE A. BREWI	R			Dat	#304	//.	TE OF M	
	THEFT THE	DALLA					1004	14	DALE	12
								1/9/	DALE	101
								11 1	Α.	1 11
									BREWER	1 11
								11 11	No. 304	/ //
								10	EPTITIE?	12/1
								80		3//
									ATIFIE SCIENT	1
								11.	The	2
								Aller	000	

JDORTHENTS	FILL	VAR	VAR
AT	E OF M	4	
10	DALE A.	12	
11	BREWER No. 304)	
012	ATIFIE SCIENT	3	
Harle	S	2	-

					0 3				
					4	0	VERY		
					5	SANDY	FIRM		
					8	0 LOAM			
					0				
			-			LIMIT	OF	TEST	PIT
			-						
	hydric	Slope %	Limiting factor	ground water		hydric	Slope %	Limiting factor	ground water
	non-hydric	30-40	17"	D restrictive layer		non-hydric	0-15	6"	 restrictive layer
1	Soil Series / phase name			Drainage HSG		Soil Series / phase name			Drainage HS
s. 🛛	Sol Series / prase name	SADDLEBACK	FSL	WD C/D	CSS	Sol Series / prase name	COLONEL	FSL	SWPD C
/		01000000000							0.110 0
	SOI	L DESCRIPTION AN	ID CLASSIFICATION	N		SO	IL DESCRIPTION AN	ND CLASSIFICATIO	N
	Exploration Symbol	TP 86	X Test Pit	Boring		Exploration Symbol:	TP 87	X Test Pit	Boring
1	0	* Depth of Organic Horiz	on Above Mineral Soll		11	0	* Depth of Organic Horizo	on Above Mineral Soil	
1	Texture	Consistency	Color	Mottling	ti s	Texture	Consistency	Color	Mottling
1					11 -				
2					11 -	GRAVEL	LOOSE	2.5Y 3/2	
3	VERY		10YR 2/2		11 =	FILL			
4	FINE				2				
6	SANDY	14 V 10040			2		0.000		
6	LOAM	VERY			Inches)	< VERY	VERY	2.5Y 3/1	
7		FRIABLE	10YR 2/1		943 2	5 FINE	FIABLE		
8				8	5 2			2.5Y 5/1	
-9	SILT		2.5¥ 5/2		<u>ب</u> اللا			7.5YR 2.5/2	
10	LOAM				AC 3			7.5YK 3/4	
12					SURFACE (Inches)				
14	STONY		10YR 3/3		_ SU			2.Y 5/3	
16	SILT				SOIL		FRIABLE		
18	LOAM			101/01		6			5YR 3/4
20	LOAMY	FRIABLE	5Y 4/2	10Y 5/1 7.5YR 3/3		SANDY		2.5Y 5/4	
22	SAND	FRIABLE	51 4/2	7.51K 3/3	NER!	2 LOAM		2.5 X 5/4	
24	SAIND				≦ _				-
26					W W		FIRM	5Y 5/2	
30					10 -	SANDY LOAM	FIRM	51 5/2	
~	SANDY			7.5YR 3/3	BEL				
40	LOAM			10Y 5/1	DEPTH BEL			1	-
+	STRATIFIED				Id o	SILTY		10GY 4/1	
50	SILT CLAY	FIRM			DE		VERY		
66	BANDS				- 1	1	FRIABLE		
	ASSUMED	BEDROCK	56"	1	1 -	LOAMY		5Y 5/3	
						REFUSAL	84"	ASSUMED	BEDROCK
	100400 C		11-10-14-14-14-14-14-14-14-14-14-14-14-14-14-			6140	Construction of the second sec		1
	hydric pop budsis	Slope %	Limiting factor	ground water		hydric non-hydric	Slope %	Limiting factor	ground water ground water
	non-hydric	0-15	18"'	restrictive layer Bedrock		non-nyana	0	0	restrictive layer M
1	Soil Series / phase name		STONY	Drainage HSG		Soil Series / phase name	L	1	Drainage HS0
1		DIXFIELD	FSL	MWD C	CSS		UDORTHENTS	FILL	VAR VA
/		DIATED	100	intro C				1144	TAK TA
Pro	fessional Endorse	ments (as applicable	9)				1 .	and the second s	
	signature:	Alle	2		Da	11/4/2009		TE OF M	
.S.		DALE A BREWI						10 UF 84	10

ojec	t Name:		Applicant Name:	SISK WIND POWER			Project Location (
	KIBBY EXPANSIO	N CLASS L		TRANSCANA	DA		K	(IBBY/CHAIN OF P	ONDS
_	2011	DESCRIPTION AN	D CLASSIEICATIO	N		20	DIL DESCRIPTION A	ND CLASSIEICATI	DN .
	Exploration Symbol:		X Test Pit	Boring		Exploration Symbo		X Test Pit	Boring
			-	L Boring					L Bonng
		* Depth of Organic Horizo				4	* Depth of Organic Horiz		
0	Texture F SANDY LOAM	Consistency	Color 7.5YR 6/1	Mottling		Texture	Consistency	Color 2.5Y 4/2	Mottling
-	F SANDI LOAM	VERY	7,51K 0/1	-	1 -	LOAM		2.51 4/2	
-		FRIABLE	2.5YR 2.5/1		1	VFSL	VERY	5¥ 5/3	-
-		THITPEL	BIO IN BIOL	-	1 -	1100	FRIABLE	0100	-
-	VERY					SILT	TRIADEL	2.5Y 3/1	
- 6	FINE					LOAM			
7	SANDY	THIXOTROPIC			(inches)				
	LOAM		5YR 2.5/2		i juc			5Y 5/3	
. 0		FRIABLE				GRAVELLY			10YR 4/4
10					SURFACE = = = = =		VERY		
12					12 12	LOAM	FIRM		
1.0					DS 14				
16					글 16				
17					SOIL 8				
18	REFUSAL	17"	ASSUMED	BEDROCK	7 20				
20					H 22			2.5Y 5/4	
22					OW MINERAL		-		_
_					N 28		FRIABLE		
-					MO7 28		FRIADLE	5Y 4/2	
-					BEL			51 4/2	_
-					L M				
-					DEPTH s s s	SALLE			
-					H 38			-	_
-					-		VERY		
-				-	50	SANDY	FIRM		-
					80	LOAM			
					68				
				_		LIMIT	OF	TEST	PIT
									_
	hydric non-hydric	Slope %	Limiting factor	ground water	0	hydric	Slope %	Limiting factor	D ground wwb
	nunenyunu	30-40		restrictive layer bedrock		non-hydric	0-15	6"	restrictive laye bedrock
s	Soil Series / phase name:	11		Drainage HSG	css	Soil Series / phase name			Drainage H
• /		SADDLEBACK	FSL	WD C/D	0.55	NC - 52	COLONEL	FSL	SWPD (



4										_	
1	hydric non-hydric	Slope %	Limiting factor	10000	ground water strictive layer		hydric non-hydric	Slope %	Limiting factor	0	ground wat restrictive lay bedrock
	Soil Series / phase name:	UDORTHENTS	FILL	Drainage VAR	HSG VAR	C.S.S.	Soil Series / phase name	DIXFIELD	FSL	Drain MV	
-	SOIL	DESCRIPTION AN	DCLASSIFICATION	4	-	_	SC	IL DESCRIPTION A	ND CLASSIFICATIO	N	-
1	Exploration Symbol:	and the second se	X Test Pit	-	Boring		Exploration Symbol	TP 91	X Test Pit		Boring
ł	3	* Depth of Organic Horiz	on Above Mineral Soil				1	* Depth of Organic Horiz	ton Above Mineral Soil		
ł	Texture	Consistency	Color	N	lottling		Texture	Consistency	Color		Mottling
1	FINE SANDY LOAM			-		-	1 2		10YR 5/1	-	
2			2.5¥ 3/3	-		1 -	3			-	
5			2.51 313	-		1 -	s VERY		7.5YR 2.5/2	-	
						s)	e FINE	VERY			
t	SANDY	VERY				SURFACE (Inches)	7 SANDY	FRIABLE			
1	LOAM	FRIABLE				19	a LOAM				
1					5Y 6/2	8 -	9	-	7 5VD 0/0	-	
2				7.	5YR 4/4	FA-	10		7.5YR 3/3	-	
2			2.5Y 4/2	-		15 -	12			-	
			2107 2 312	-			17			+	
t				-		SOIL	18				
	LOAMY					7	8 SANDY	FRIABLE	2.5Y 4/4		
2	SAND						22 LOAM		20.171	_	7.5YR 3/. 5Y 6/2
ł	REFUSAL	22"				N-	REFUSAL	FIRM 23"	5Y 4/4	+	51 6/2
ł				-		12-	REFUSAL	23		-	
1				-		0 -	10			+	
t						BE				-	
T						12					
ļ				-		B -				-	
				-		_				+	
1				-		-	10			+	
t				-					-	+	
t				-		-	50			-	
t						1.5					
	hydric non-hydric	Siope %	Limiting factor	D ret	ground water trictive layer Bedrock		hydric non-hydric	Slope % 	Limiting factor		ground wat restrictive lays bedrock
1	Soil Series / phase name:	BRAYTON	FSL	Drainage SWPD	HSG	CSS	Soil Series / phase name	DIXFIELD	FSL	Drain	nage H

11/4/2009

#304

Dat

	Exploration Symbol:	DESCRIPTION AN TP 88	X Test Pit	Boring		E	xploration Symbol:	and the second in the local data with the second	ND CLASSIFICATIO	Boring
ł		* Depth of Organic Horizi			11	F		* Depth of Organic Horiz	- taska	
d	Texture	Consistency	Color	Mottling	11	1	Texture	Consistency	Color	Mottlin
- 0	rexture	Consistency	COIDI	wouning	1 -	0	SANDY	CONSISTENCY	2.5Y 5/1	MOUNT
10	VERY				11 ~	-	LOAM		ALL A DIA	
15	STONY	FRIABLE	10YR 3/1	-	1 -	- 1	FINESL	VFRIABLE	5YR 2.5/1	-
20	SANDY LOAM				1 -	1	STONY			-
25	NATIVE				11 -	-	WITH			-
30	FILL				1.	6	CHANNERS		7.5YR 3/3	-
32				-	(Inches)	7				
34	STONY	FRIABLE	2.5Y 3/1		12-	8	SANDY			-
36	SANDY		1.000.00.00.00	5Y 6/1		0	LOAM	FRIABLE	-	
38	LOAM		5Y 6/1	7.5YR 3/3	SURFACE	10	1000000		1	-
40					18-	12				
42					15-	14			10YR 4/4	
44				5Y 6/1		10				
46				10YR 4/4	SOIL	18			-	
45	SANDY		5Y 4/2		11	20	LOAMY	FIRM	2.5Y 4/4	2.5Y 5/
50	LOAM	FIRM			BELOW MINERAL	22	SAND	FRIABLE	2.5Y 4/3	7.5YR 3
52					19-	24	REFUSAL	22"		
54					11	26				
56					13	-				
58					13-	30				-
50					HH -	-				
62	GRAVELLY					-				
64	LOAMY		5Y 4/3		DEPTH	-				
66	SAND				18-	-				
68					11 7	40			-	
70					11 -	-				
	LIMIT	OF	TEST	PIT		60				
-						-				
-										
	hydric	Slope %	Limiting factor	D ground water			hydric	Slope %	Limiting factor	 ground w
	non-hydric			restrictive layer st	1.		non-hydric			D restrictive to D bedrock
	Soil Series / phase name:	UDORTHENTS	FILL	Drainage HSG VAR VAR	C.S.S	S	oil Series / phase name;	DIXFIELD	FSL	Drainage MWD

 SOIL PROFILE/CLASSIFICATION INFORMATION

 for subsurface investigations at DEP Site Location Projects

 Applicant Name:
 SISK WIND POWER
 Project Location (municipality)

 TRANSCANADA
 KIBBY/CHAIN OF PONDS

FORM F

C.S.S. signature: name:

DALE A. BREWER

>

Project Name: KIBBY EXPANSION CLASS L 09013SS

Joint Strong Joint Construction Darange HSG Sold Series / phase name STONY Darange HSG Darange HSG Sold Series / phase name STONY N N Darange HSG Sold Series / phase name Sold Series / phase name Darange HSG Darange HSG Sold Series / phase name Sold Series / phase name Darange HSG Darange HSG Sold Series / phase name Sold Series / phase name Darange HSG Darange HSG Sold Series / phase name Sold Series / phase name Darange HSG Darange HSG -7 'Depth of Organic Holden Above Mereal Sold Consistency Color Mottling -7 ToxAure Consistency Color Mottling - - -8 SANDY IOAM 7.55YR 3/3 - - - - - -9 -10 0 ASUMPI CoAM FILABLE SixNDY VERY - - -	FO	RM F								0901355
								ots		
	roject			Applicant Name:	SISK WIND POWER	_		Project Location		
Participant Symbol Try Tate P Bong Image: Control Contro Control Control Control Control Control Control Control		KIBBY EXPANSIO	ON CLASS L		TRANSCANA	DA		1	KIBBY/CHAIN OF PC	NDS
Image: Sector Processor Test Processor <thtest procesor<="" th=""> Test Processor <tht< td=""><td></td><td>SOI</td><td>L DESCRIPTION AN</td><td>ND CLASSIFICATION</td><td>4</td><td></td><td>SO</td><td>IL DESCRIPTION A</td><td>AND CLASSIFICATIO</td><td>N</td></tht<></thtest>		SOI	L DESCRIPTION AN	ND CLASSIFICATION	4		SO	IL DESCRIPTION A	AND CLASSIFICATIO	N
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Image: State in the intervention of the interventinteries of the intervention of the intervention of th	0	Texture	Consistency	Color	Mottling	11	Texture	Consistency		Mottling
Image: Non-With Plant Plant<	2	FINE		10YR 6/1		11 -	2		TOTRET	
Image: Statute in the	3					1 =	3	CT-NX2		
SNOV LOAN FRAME Image: State of the sta	-		VERV	7 5VR 2 5/2	-	- 1			2.5V.3/3	
No. No. <td>0 0</td> <td></td> <td></td> <td>THE ALLE</td> <td></td> <td>- 1</td> <td>0</td> <td>TRIADLE</td> <td>4.07.8.07.0</td> <td></td>	0 0			THE ALLE		- 1	0	TRIADLE	4.07.8.07.0	
No. No. <td>che</td> <td></td> <td></td> <td></td> <td></td> <td>Che.</td> <td>7</td> <td></td> <td></td> <td></td>	che					Che.	7			
No. No. <td>5_</td> <td>TOAM</td> <td></td> <td>5VR 3/4</td> <td></td> <td></td> <td>*</td> <td></td> <td></td> <td>_</td>	5_	TOAM		5VR 3/4			*			_
No. No. <td>ACE ACE</td> <td>contra</td> <td></td> <td>UTR 0/1</td> <td></td> <td>ACE</td> <td>VERY FINE</td> <td>FRIABLE</td> <td>2.5Y 5/2</td> <td></td>	ACE ACE	contra		UTR 0/1		ACE	VERY FINE	FRIABLE	2.5Y 5/2	
No. No. <td>1 12</td> <td></td> <td></td> <td></td> <td></td> <td>HE -</td> <td></td> <td></td> <td></td> <td></td>	1 12					HE -				
Image: Solution of the second of th		REFUSAL	12.	ASSUMED	BEDROCK				TEST	
Image: Solution Synchi Tres So						- 201			1001	
Image: state of the second state of the sec	18		· · · · · · · · · · · · · · · · · · ·				0			
	L 20					- 19 -				-
Image: state of the second state of the sec						WW 2	5			
	8					18-				
	- <u><u><u></u></u></u>					- 91	0	-		
Image: state of the second state of the sec						13-				
Image: state of the second state of the sec										
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image:						- 1	9			
montypic 0.13 12° 0 reschester 33 Sitt Sinta rune: Sitt Sinta rune: Danage 100° 0 setter 33 Sitt Sinta rune: Sitt Sinta rune: Danage 100° 0 setter Danage 100° 0 setter Danage 100° Setter Danage 10						0	0			
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Job 3 similar future met JULX LuxAn L Juna uses US US <thus< th=""> <thus< th=""> <thus< th=""></thus<></thus<></thus<>		hydric	Slope %	Limiting factor	D ground water	0		Slope %	Limiting factor	C ground water
3.8 Soil Select / phase name Darage 100 WD COI Soil Select / phase name Darage 100 WD Soil Description AND CLASSFICATION SWP CO		non-hydric	0-15	12"			non-hydric	0-15	10"	
3.3 LYMAN L WD CD SOL DESCRIPTION AND CLASSFICATION SOL DESCRIPTION AND CLASSFICATION SOL DESCRIPTION AND CLASSFICATION SOL DESCRIPTION AND CLASSFICATION Capacity of Capacity		Soil Series / phase name		STONY			Soil Series / phase name	6		
Exploration Symbol: TP 94 Test Pr Boring	S.S.			L		C.S.S			FSL	
Exploration Symbol: TP 94 Test Pit Boring		601				1	60	DECODIDITION		N
2	1									
Toolare Consistency Color Motting 3 SANDY 10YR 6/1					D Boring	- 1				L bonng
SANDY IOYK 6/1 IOAM VERY IOYK 6/1 FRIABLE SYR 2.5/1 IOAM SANDY FRIABLE SYR 2.5/1 I IOAM FRIABLE SYR 2.5/1 I IOAM FRIABLE SYR 2.5/1 I IOAM FRIABLE IOAM I IOAM FRIABLE IOAM I IOAM FRIABLE IOAM I GRAVELLY IOYR 3/4 IOAM I GRAVELLY IOYR 3/4 IO I GRAVELLY VERY 2.5Y 4/2 I GRAVELLY VERY 2.5Y 5/4 I GRAVELLY VERY 2.5Y 5/4 I GRAVELLY VERY 10° K 4/4 I GRAVELLY VERY 2.5Y 5/4 I GRAVELLY VERY 10° K 4/4 I GRAVELLY VERY 0.0YK 4/4 I GRAVELY VERY 0.0YK 4/4 I					Mottling	ti .				Mottling
John VERY VERY FINE 5YR 25/1 SANDY FRIABLE SANDY VERY SANDY	1				induning		1			
SANDY FRIABLE SYR 2.5/1 FINE SANDY VERY 2.5Y 3/2 IDAM FRIABLE FINE SANDY VERY 10AM FINE FINE 10YR 3/4 FINE FINE FINE GRAVELLY VERY 2.5Y 4/2 FINE FINE FINE GRAVELLY VERY 2.5Y 4/2 REPUSAL 20" ASSUMED BEDROCK FINE 10" REPUSAL 20" ASSUMED BEDROCK FINE FINE Sol Series / phase name FINE TUNBRIDGE FSL Damon mark Sol Series / phase name FSL TUNBRIDGE FSL Oraliage Sol Series / phase name FSL TUNBRIDGE FSL FSL Sol Series / phase name BOULDERY Sol Series / phase name BALTON Sol Series / phase name BALE A. BREWER	2		VEDV	10YR 6/1			2			
Bit Hold SYR 2.5/1 PINE FINE SANDY VERY IDAM FRIABLE IDALE A. BREWER IDALE A. BREWER	-	LOAM			-		VERY		2.5Y 3/2	
FINE Image: solution of the solution o	5			5YR 2.5/1						
Image: status indicator i	es)	EINIE			_	es)				
Image: status indicator i	- 1 - 1 - 1					- sch	7 LUAM	FRIADLE		
Image: status indicator i	9 LL			7.5YR 3/3			¢.			
Image: status indicator i	ID ID		FRIABLE			FAC	0		2.5Y 4/2	
Image: status indicator i	E 12	GRAVELLY				5-1				
SANDY LOAM VERY is CREPUSAL 20" ASSUMED BEDROCK is CREPUSAL 20" ASSUMED BEDROCK is CREPUSAL is CREPUSAL 20" ASSUMED BEDROCK is CREPUSAL is CREPUSAL 20" ASSUMED BEDROCK is CREPUSAL is CREPUSAL is Is				10YR 3/4					5Y 4/2	
Image: Solution of the second state of the second	S 17	And a second s			-			16"	FIRM	10YR 4/4
Image: Solution of the second state of the second	18 20			2.5Y 5/4		- BAL	0			
Image: Solution of the second state of the second					BEDROCK	- <u>§</u>			-	-
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a hydric Slope % Limiting factor 0 gound water a hydric 15-30 17" a beacce s.s Sol Series / phase name: Drainage HSG C professional Endorsements (as applicable) 0 11/4/2009 0 11/4/2009 s.s. balance Date A, BREWER Date A, BREWER 0 11/4/2009							0	1		-
a hydric Slope % Limiting factor 0 gound water a hydric 15-30 17" a beacce s.s Sol Series / phase name: Drainage HSG C professional Endorsements (as applicable) 0 11/4/2009 0 11/4/2009 s.s. balance Date A, BREWER Date A, BREWER 0 11/4/2009										
a hydric Slope % Limiting factor 0 ground water non-hydric 15-30 17" a Beacocc set statute isset table is get 0 -15	_					- 1				
non-hydric 15-30 17" * restrictive layer s.s Sol Series / phase name: Drainage HSG TUNBRIDGE FSL WD C Professional Endorsements (as applicable) Data 11/4/2009 .s.s. iggrature: Date A, BREWER	-									
non-hydric 15-30 17" * restrictive layer s.s Sol Series / phase name: Drainage HSG TUNBRIDGE FSL WD C Professional Endorsements (as applicable) Data 11/4/2009 .s.s. iggrature: Date A, BREWER	-		1						(
Image			Slope %							
SS TUNBRIDGE FSL WD C Professional Endorsements (as applicable)		- serving diffe					(D bedrock
Professional Endorsements (as applicable) S.S. bygrature DALE A. BREWER No. 304	s.s	Soil Series / phase name	TINDE			CSS	Soil Series / phase name			
(A. BREWER No. 304)	1		TUNBRIDGE	FSL	WD C			BRAYTON	FSL	SWPD C
(A. BREWER No. 304)	Pro	fessional Endorse	ments (as applicabl	e)				1		
(A. BREWER No. 304)	S.S.	signature:	de	2-2-					SE OF A	
(A. BREWER No. 304)	.0.0.	name:	DALE A. BREW	ER		Li	#304	1/2	ATL	
(A. BREWER No. 304)								1/05	DALE	1201
BREWER No. 304										1. 11
No. 304 / //										1 11
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SCIENTIS SCIENTIS								111		/ //
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Chul Bar								16	1 COURT	~//
Button									OCIER	
								De	tost	2-

_	SOIL	DESCRIPTION AN			<u> </u>	SOI	L DESCRIPTION AN	and the second se	N
	Exploration Symbol:		X Test Pit	Boring		Exploration Symbol:		X Test Pit	Boring
	Texture	* Depth of Organic Horizo Consistency	n Above Mineral Sol Color	Mottling		9 Texture	* Depth of Organic Horizo Consistency	n Above Mineral Soil Color	Mottling
1	TEALUIG	Consistency	0000	woung	-				Rentining
2	·				2	GRAVELLY FINE	VERY FRIABLE	7.5YR 5/1	
4		VERY	2.5 Y 4/2		4	SANDY LOAM		7.5YR 2.5/2	
5	SANDY LOAM	FRIABLE			5				-
7	LOAM				DEPTH BELOW MINERAL SOIL SURFACE (Incres)				
#		-		2.57.1/2	(inc	CANDN	FRIABLE	10YR 3/6	
9				2.5Y 4/3 7.5YR 3/3	ACE 0	SANDY LOAM			
12					IRF.				
14	· · · · · · · · · · · · · · · · · · ·		5Y 5/1		11 SU		VERY FIRM	10YR 3/3	
18	LOAMY	FRIABLE			SOI =				
20	SAND				3AL	REFUSAL	18"	ASSUMED	BEDROCK
24					INEF				
28 28					25 W A				_
30	SANDY LOAM		2.5Y 5/3	7.5Y 3/3	107				
1	REFUSAL	30"	NOT	BEDROCK	1 BE				
-					114				-
+					40				
					60		6		
4									
-					-				
	hydric	Slope %	Limiting factor	ground water	0	hydric	Slope %	Limiting factor	ground water
	non-hydric	0-15	8"	restrictive layer bedrock		non-hydric	15-30		restrictive layer bedrock
s	Soil Series / phase name:	BRANTON!	FSL	Drainage HSG SWPD C	CSS	Soil Series / phase name:	TUNBRIDGE	FSL	Drainage HSG WD C/D
/		BRAYTON						1	
-		DESCRIPTION AN	Name of Concession, Name of Co				L DESCRIPTION AN	And in case of the local division of the loc	
	Exploration Symbol:		X Test Pit	Boring		Exploration Symbol:		X Test Pit	Boring
_		* Depth of Organic Horizo		Matellan			* Depth of Organic Horizo		Antilian
- 0	Texture	Consistency	Color	Mottling	t	Texture FINE	Consistency	Color	Mottling
2	CW T	1/FDA/	53/ 0 5/A		-2	SANDY LOAM	VERY	7.5YR 6/1	
3	SILT LOAM	VERY FRIABLE	5Y 2.5/1		-3		FRIABLE	5YR 2.5/1	
6		-			5				
- 6					(sau	VERY FINE			
	FINE	VERY			(Incl	SANDY LOAM	FRIABLE	7.5YR 3/3	
9	SANDY LOAM	FIRM	5Y 4/2		a dCE				
12					RFA zi o				
6 7 8 9 10 12 14 18 18 20 20	LIMIT	OF	TEST	PIT	W MINERAL SOIL SURFACE (Inches)	CHANNERY	VERY	2.5Y 4/4	10YR 4/4 OXYAQUIC
16					≡ ≡		FIRM	2.31 4/4	OATAQUIC
20					AL	DEPENDENT.	0.011	1 COLUMN	BEISBOOCK
+					NEH	REFUSAL	20"	ASSUMED	BEDROCK
1					IIW /				
30					NO7				
					BEI				
-					DEPTH BELC				
+					DE				
40					40				
58									
-					50				
90					-				
_	hydric	Slope %	Limiting factor	gitzund water	0	hydric	Slope %	Limiting factor	ground water
	non-hydric	0-15	0''	restrictive layer Bedrock		non-hydric	15-30	12"	restrictive layer bedrock
s	Soil Series / phase name:			Drainage HSG	css	Soil Series / phase name		-	Drainage HSG
1		PEACHAM	MUCK	VPD D			TUNBRIDGE	L	WD C/D
	and the second se	nents (as applicable)						
5.5.F	signature:	DALLE A BREAK	2-		Dat	11/4/2009		TE OF MA	
	name.	DALE A. BREWE	R		Lic	#304	1/28		1A
							1/05/	DALE	101
							11 /	A.	/ //
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FORM F
SOIL PROFILE/CLASSIFICATION INFORMATION
Ior subsurface investigations at DEP Site Location Projects
Project Name: Applicant Name: SISK WIND POWER Project Location (municipality)
KIBBY EXPANSION CLASS L TRANSCANADA KIBBY/CHAIN OF PONDS

L

1.0	ame:		Applicant Name:	SISK WIND POWER			Project Location (n		
К	IBBY EXPANSIO	ON CLASS L		TRANSCANA	DA		KI	BBY/CHAIN OF PO	DNDS
_			CLASSIFICATION				L DESCRIPTION AN		_
Exp	ploration Symbol:	And the second s	X Test Pit	Boring		Exploration Symbol:	and the second se	X Test Pit	Boring
		* Depth of Organic Horizo					* Depth of Organic Horizo		T to see the
0	Texture	Consistency	Color	Mottling	-	Texture	Consistency	Color	Mottling
2			10YR 5/1		-		VERY	7.5YR 5/1	
3					1		FRIABLE	5YR 2.5/1	
4	VERY FINE SANDY LOAM	VERY		-	-	VERY FINE			
6 5	SANDYLOAM	FRIABLE	7.5YR 3/3			SANDY LOAM			
7	GRAVELLY				SURFACE (Inches)			7.5YR 2.5/3	
8	VERY FINE		5YR 2.5/1		(inc		FRIABLE		
9 S	SANDY LOAM				<u> </u>				
10					RFAC 2 3				
12					SUR				
16		FRIABLE	10YR 3/3		S 7		VERY FIRM	2.5Y 4/3	
1.0	LOAM				" SO	LIMIT	OF	TEST	PIT
20					AL 20				
22				7.5YR 2.5/2	EB -				
26				7.518 2.5/2	- W 26				-
20		VERY	2.5Y 4/3		3-				
30		FIRM			07.30				
32					BE				
34					DEPTH BELOW MINERAL SOIL				
36					- B				
-	LIMIT	OF	TEST	PIT	40				
					11 -				
					60				
					41 2				
-					- 1				
	hydric	Slope %	Limiting factor	D ground water	0	hydric	Slope %	Limiting factor	ground water
D	non-hydric		Sec. and	ground water restrictive layer		non-hydric		12	ground water instrictive layer
		0-15		D bedrock			0-15		D bedtock
Soil	Series / phase name		BOULDERY	Drainage HSG	CSS	Soil Series / phase name:		STONY	Drainage HSG
1		MARLOW	FSL	WD C			MARLOW	FSL	WD C
	SOIL	DESCRIPTION AND	CLASSIFICATION		1	SO	L DESCRIPTION AN		N
Eve	ploration Symbol:		X Test Pit	Boring		Exploration Symbol:		X Test Pit	Boring
EX		and the second sec		D borning	- 1				D Boring
		* Depth of Organic Horizo			11	5	* Depth of Organic Horizo		
0	Texture	Consistency	Color	Mottling 5Y 6/1	-	Texture	Consistency	Color	Mottling
7				JI WI	-	VERY FINE	VERY	7.5YR 5/1	
3						SANDY LOAM	FRIABLE	710114.011	
4									
5	STONY							5YK 2.5/1	
6									
	COARSE	FRIABLE	5Y 3/1		(SS)				
2	COARSE SAND	FRIABLE	5Y 3/1		ches)				
2		FRIABLE	5Y 3/1		(Inches)	EINE			
7 8 9		FRIABLE	5Y 3/1		ACE (Inches)	FINE SANDY LOAM	FRIABLE	5YR 3/3	
2 8 9 10 12		FRIABLE	5Y 3/1		FACE (Inches) al a	SANDY LOAM	FRIABLE		
2 8 9 10 12 14		FRIABLE	5Y 3/1		SURFACE (Inches)	SANDY LOAM	FRIABLE		
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FORM F

ATTACHMENT B.14-2

Erosion and Sedimentation Control Plan

TransCanada Maine Wind Development Inc.



Prepared for: TransCanada Maine Wind Development Inc.

Prepared by:

TRC 14 Gabriel Drive Augusta, ME 04330

October 13, 2009

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1.0 INTRODUCTION

TransCanada originally prepared this Erosion and Sedimentation Control Plan (E&S Plan) as part of its application for development of the Kibby Wind Power Project (the "Kibby Project). It is now being used in connection with the proposed Kibby Expansion Wind Power Project (the "Kibby Expansion Project" or "Project"). The Kibby Expansion Project consists of 15 Vestas V90 3 MW wind turbines along the Sisk Mountain ridgeline, adjacent to and west of the current Kibby Project. Associated elements of the Project include: access to the turbines utilizing the existing forestry roadway network to the greatest extent possible, aboveground 34.5 kilovolt ("kV") electrical interconnections (collector lines) between the turbines and to a common, newly proposed Kibby Expansion Project Substations, and a short 115 kV electric transmission tap line between the new Kibby Expansion Project Substation line.

This E&S Plan contains erosion and sedimentation control requirements, standards, and methods that will be used to protect soil and water resources during construction of the proposed project. This E&S Plan is largely based on Land Use Regulation Commission (LURC) standards in Chapter 10.25 and 10.27; the Maine Department of Environmental Protection's (DEP) Maine Erosion and Sediment Control Best Management Practices (BMPs), dated March 2003; and specific BMPs appropriate for this type of construction.

The primary goals of any erosion and sedimentation control plan are to minimize soil movement and loss, preserve the integrity of environmentally sensitive areas, and maintain existing water quality. This document will supply TransCanada personnel and their representatives and contractors with a single, cohesive set of erosion control specifications for construction associated with the Kibby Expansion Project. This document is designed to provide specifications for the installation and implementation of soil erosion and sedimentation control measures while allowing adequate flexibility for application of the most appropriate measures based on site-specific conditions. All bid packages and contracts for work performed for the Kibby Expansion Project will include these specific guidelines to ensure the work is completed in an environmentally sensitive manner. TransCanada personnel and their representatives will ensure that the procedures contained in this E&S Plan are followed by regularly inspecting all work and requiring corrective action when necessary.

Implementation of the following objectives is required to achieve the goals of this plan:

- Minimize the extent and duration of disturbance;
- Protect exposed soil by diverting runoff to stabilized areas;
- Install temporary and permanent erosion control measures (including site restoration) and
- Establish an effective inspection and maintenance program.

The remainder of this E&S Plan is organized as follows:

- Section 2.0 describes the planning and design considerations that are utilized to minimize the potential for soil erosion and sedimentation into protected natural resources during construction of the project;
- Section 3.0 provides the general construction sequence for the project, including the implementation of erosion and sedimentation control measures;
- Section 4.0 describes the typical construction techniques used to minimize the potential for erosion and sedimentation;
- Section 5.0 provides the specific types of wetland and waterbody crossing methods to be used during construction;
- Section 6.0 describes the specific water diversion structures to be used, primarily water bars;
- Section 7.0 includes detailed descriptions of the types and proper installation of structural methods for erosion and sedimentation control;
- Section 8.0 provides detailed descriptions of the types and proper application of nonstructural erosion and sedimentation control measures;
- Section 9.0 describes the modified techniques and application of control measures to be used during winter time construction (November 1 through April 15 of any given year);
- Section 10.0 summarizes restoration procedures;
- Section 11.0 provides details of the multiple levels of supervision and inspection for compliance with environmental requirements that will be implemented during construction; and

 Section 12.0 describes the environmental training program for construction contractors and subcontractors.

This document includes appendices that contain: definitions of scientific and technical terms; a list of project contact personnel; illustrations of proper application of erosion and sedimentation control techniques along with illustrations of improper application as a basis for comparison; site-specific erosion and sedimentation control drawings; and other generic and specific references to ensure the proper and adequate implementation of erosion and sedimentation control methods during construction activities. All scientific and technical terms used in this document are defined in Appendix A.

2.0 PLANNING AND DESIGN CONSIDERATIONS

2.1 Resource Identification

Sensitive natural areas that will receive priority treatment include:

- Streams and rivers;
- Wetlands;
- Waterbody and wetland buffers;
- Significant Wildlife Habitat; and
- Habitat for rare species.

Sensitive natural areas that may receive priority treatment, depending upon the specific construction activities and timing of the project, include:

- Steep slopes;
- Unstable soil conditions; and
- Areas that have high potential to be prehistoric sites (e.g., well-drained soils on terraces overlooking streams and rivers).

Wetland delineation efforts, vernal pool surveys, and inventories of other sensitive natural resources have been completed and sensitive natural areas that require priority treatment have been identified. Procedures for avoiding or crossing sensitive natural areas will be incorporated into construction planning to ensure that the E&S Plan is properly implemented. Construction plans are designed and drawn to provide contractors and inspectors with a comprehensive reference guide that includes, but is not limited to, locations of sensitive natural areas, access, and abutter and landowner information. If modifications to the plans with respect to natural resources need to be made in the field, the TransCanada project environmental manager will make necessary changes and will notify all necessary personnel.

Copies of the construction plans will be provided and explained to construction foremen and equipment operators to ensure that construction practices meet the intent of avoiding or minimizing impacts to the identified sensitive natural areas. In addition to the plans, the proposed access ways and water/wetland crossing locations, as well as other environmentally sensitive areas where activities will be restricted or prohibited, will be flagged and/or will have signs posted in the field.

Prior to any clearing or construction work in or near any sensitive natural areas, a "walkthrough" will be conducted. Typically, "near" a sensitive area is defined as within 100 feet of the closest edge of the resource, although more distant resources may be considered where steep slopes or easily eroded soils are present. Attendees at the walk-through will include: 1) the contractor; 2) TransCanada personnel and/or any designated representative(s); and may include 3) agency representatives (e.g., LURC staff, DEP project manager, U.S. Army Corps of Engineers [USACE] personnel). The purpose of the walk-through is to achieve the following objectives:

- Review available or alternate points of access;
- Review sensitive natural areas within or adjacent to the project access and project construction areas;
- Review wetland and stream locations in order to confirm appropriate crossing methods (mats, frozen ground, tracked equipment) where unavoidable;
- Review the locations of rare plants;
- Review appropriate methods to be used to protect sensitive areas in accordance with the specifications in this plan;
- Identify future "No-Access" areas and buffers;
- Review color designation for all flagging used;
- Establish the Communication Chain of Command (Contact Point); and
- Identify routes and flag within ROW construction roads.

In order to minimize impacts to sensitive natural areas, the above objectives will continually be evaluated throughout the construction process. Project superintendents, foremen, and inspectors will also monitor weather conditions and reports on an on-going basis. Knowledge of changing or anticipated wet weather will allow time to plan for and address erosion control needs. In this way, TransCanada and its contractors will be prepared to respond to changing environmental conditions (e.g., unusually wet or dry weather) and other unknowns that are inherent in any construction project.

2.2 "Walk-Through" Mechanics

2.2.1 Use of Flagging and Signs

Flagging of no-access areas and travel ways will be conducted at the time of the walkthrough in order to identify visually select features or construction methods to be used. All wetlands and streams crossed were flagged earlier as part of the wetland delineation effort; where replacement flagging is required, it will be provided. During the walk-through it is especially important to identify areas with water that are not protected resources (i.e., not wetlands or streams), as such areas are common in the project area during rain events or snow melt. These can be problematic areas for equipment access and construction and unless identified and addressed properly, may pose erosion and sedimentation problems. Signs will also be installed following the walk-through to direct construction to approved access routes and away from "no-access" areas. The Kibby Expansion Project flagging color-code is as follows:

Glow-pink with the printed words "Wetland Delineation," "Wetland Boundary" or "Wetlands" denotes the edge of wetlands. Each flag has a field team, wetland identification, and flag sequence number noted as designated during the delineation and can be cross-referenced to field notes, photos, and wetland impact data.

Yellow without printed words denotes the location of a stream or river channel and will have a stream designation written on each as with the wetland delineation flags. The yellow flags were tied at the centerline of each stream or on the banks of larger streams and rivers. For each of these resources, specific vegetation management buffers are required that restrict vegetation removal and will require environmental measures such as water bars, erosion control mulching, or silt fence.

Red with or without the printed words – "Do Not Cross" – denotes a No-Access Area where no equipment is allowed.

Glow-green with no printed words denotes approved travel ways. This is typically flagged on each side of the access-way to denote the designated travel lane for all access. *Glow-pink with black stripes*, or otherwise printed with the words "Waterbody Buffer" or "Stream Buffer," denotes a setback from a water resource and will be treated the same as a No-Access Area. It also designates the area where special clearing and vegetation maintenance requirements apply at designated waterbodies and streams (see Section 4.3).

2.2.2 Identification and Use of Access

TransCanada will utilize existing public roads, maintained logging roads, or dormant logging roads to access the project construction area. These roads provide access for equipment to travel back and forth to the project area for clearing and construction activities. The access roads were selected to avoid natural resource impacts to the greatest extent practicable. Improvements to these access roads will be limited to trimming overhanging vegetation, replacing damaged or malfunctioning culverts, and installing temporary mats or bridges over wetlands and streams as needed to allow safe, reliable passage of construction equipment and materials. In a limited number of areas, additional gravel may need to be added to logging road surfaces to improve the road for passage of construction equipment. This will help prevent rutting and off-road sedimentation. Any new gravel and grading will be limited to that necessary to maintain a safe and reliable road surface and will not be placed in protected resources such as wetlands.

The movement of equipment and materials will be confined as much as possible to a single road or travel corridor within the project construction area. Wetland and waterbody crossings within the construction area have been kept to the minimum number and length. Wetland and waterbody crossings have been sited to minimize the span of a wetland or stream crossing, and to avoid the more environmentally sensitive portions of a wetland or stream.

In all cases, TransCanada and its contractors will avoid and minimize impacts to sensitive natural areas to the greatest extent practicable. As a result of this planning and preconstruction walk-through process, adverse impacts from construction near and in wetland and stream crossings, steep slopes, unstable soils, and other sensitive natural areas will be minimized to the extent possible.

3.0 GENERAL CONSTRUCTION SEQUENCE

Generally, the construction of a wind project includes the following activities:

- pre-construction meeting;
- preparation of the construction site (mobilization, surveying, signage, technical evaluation);
- clearing of existing vegetation
- installing perimeter permanent and temporary stormwater controls as shown on plans (i.e. off-site diversion channels, filter berms, diversion berms, sediment traps, etc.)
- grubbing for the construction of the turbine access roads, improvement of the existing roads and the preparation of the work areas;
- road construction;
- installation of the wind turbines;
- installation of the electrical lines and construction of the substation; and
- stabilization (following completion of each work element).

Construction of the Kibby Expansion Project will generally occur over two construction years. The schedule assumes that most types of construction efforts will be curtailed during winter months through the spring mud season, and that work would recommence once suitable ground conditions for heavy loads are available in late spring. Construction activities can be discussed with respect to two distinct construction areas, the turbine locations (which includes roads, collector lines, substation and turbines), and the transmission line. Each of these activities will be discussed in the following sections.

3.1 **Pre-construction Meeting**

A pre-construction meeting will be held between TransCanada and relevant regulatory agencies to review project activities and regulatory requirements no less than seven (7) calendar days prior to construction. The objective of the meeting will be to establish communication protocols for construction activities, review the construction activities and schedule, identify site security measures and review permit requirements. The meeting will be attended by representatives from TransCanada, TransCanada construction contractors (including logging contractor), Land Use Regulatory Commission (LURC), and Maine Department of Environmental Protection (MEDEP). At the meeting, a TransCanada representative will provide details and a schedule for planned construction activities. TransCanada and LURC will also establish an inspection procedure and schedule. Upon completing the meeting, minutes from the meeting will be circulated to all parties in attendance prior to the start of construction.

3.2 Preparation of the Construction Site

Preparation of the construction site will consist of many different activities, including, surveying, signage and traffic control, site technical evaluation, site mobilization, and preclearing. These activities are detailed in Table 1.

	- Measurement and identification using Global Positioning System
	(GPS), flagging tape and other survey markers the exact site of the
	access roads, the wind turbines and the electrical interconnection
Cum covin a	
Surveying	lines. This makes it possible to determine with accuracy that work will
	proceed inside the limits of the project. (If necessary, this work will
	include some minor center line and traverse line clearing to make the
	survey possible).
	- Installation of the road signage required within the limits of the project
	and a reasonable surrounding area.
	- Special signage will be developed in conjunction with the property
Signage and Traffic	owner for any shared roads and facilities. Traffic control and
Control	communication protocols will be developed to ensure safe and efficient
	movement of both construction equipment and logging vehicles.
	- Determination and identification of the exact sites for storage and
	work areas.
Site technical	- Various expert evaluations of the technical needs for site preparation
Site technical	(clearing, grubbing, etc).
evaluation	- Geotechnical evaluation of the project site.
	- Install rock construction entrance at access point off public roads (as
Site mobilization	shown on plans).
Sile mobilization	- Mobilization and installation of construction trailers and first aid
	facilities for the employees.
	- Minimal clearing of trails to allow geotechnical testing equipment to drill
	boreholes at wind turbine sites and other areas requiring specifics of
	subsurface conditions for design purposes.
Pre-clearing	- The Contractor shall install temporary sediment barriers (i.e. filter berms)
	along constant elevations just downslope of areas where grubbing
	activities will take place.

TABLE 1: PREPARATION OF CONSTRUCTION SITE

3.3 Road and Turbine Pad Construction

Construction of the access and turbine roads will be initiated within 30 days after clearing and grubbing. TransCanada expects to sequence crews in an order that will allow construction to occur in two sub-operational areas at one time. This approach to the construction will initiate with grading of road and pad areas within one area. Once the area is accessible, turbine construction and installation of electrical cable will be undertaken. As earthwork activities in one area are complete and turbine construction begins, earthwork activities on the next area will be initiated. This approach to construction sequencing will shorten the overall construction schedule. Within each operational area, activities will be similar and include the steps below:

Install rock construction entrance at access point off public roads (as shown on plans) and mobilize construction equipment to the designated staging/operational area. Clear existing vegetation along the proposed roadway corridors but do not commence grubbing and grading activities until temporary and permanent stormwater measures are installed. TransCanada will work closely with the property owner to coordinate the removal of merchantable timber from the project area.

In advance of grubbing and road grading operations, the Contractor shall construct measures to control off-site (clean) runoff from mixing with on-site (sediment laden) runoff including permanent diversion channels, temporary pipe slope drains, riprap slope protection, cross culverts (temporary or permanent), riprap outlet protection, and level spreaders. The diversion of off-site (clean) runoff shall be accomplished in the following manner:

When grading the access road in an upslope direction, off-site runoff will be directed to the already-constructed temporary pipe slope drains, riprap slope protection, cross-culverts, and level spreaders using the permanent diversion channels. See the Final Development Plan Application, Appendix F – Design Drawings – Roads and Turbines, for details.

- When grading the road in a down slope direction, the permanent diversion channels will be constructed ahead of grading activities to intercept off-site runoff. In between cross-culverts (and associated temporary pipe slope drain, outlet protection, and level spreaders), the Contractor will construct a temporary berm or swale to direct the intercepted runoff around and ahead of the advancing grading operations, releasing it just downslope of the roadway. As the level spreaders, outlet protection, cross-culverts, and temporary pipe slope drains are installed and stabilized, runoff from the temporary or permanent diversion channels can be redirected to the temporary pipe slope drain and conveyed through the construction site while remaining "clean" water and prevented from interacting with sediment-laden runoff. The Contractor may opt to install a temporary metal pipe in place of the permanent HDPE pipe until the permanent pipe can be installed.
- In general, runoff from roads and turbine pads will occur as overland/sheet flow and will be controlled during construction using mulch filter berms. Where concentration of on-site runoff is unavoidable runoff will be collected in a roadside channel and directed to a temporary sediment trap. Once at least a uniform 70% perennial vegetation cover is established and the sediment trap is removed, flow in the channel shall be directed to a permanent level spreader.
- Construct wind turbines and electrical cables. Disturbed areas will be regraded and stabilized with seeding and mulch within 24 hours after reaching final grade and completion of turbine erection. See section 3.4 for installation of wind turbines.
- Demobilization construction area Remove all contractor equipment and stockpiles. Properly dispose of any spoil material. Seed and mulch any remaining disturbed areas to permanently stabilize the site. See section 3.6 for restoration.

As one operational area is completed, equipment will then be shifted to the construction of the next operational area. Separate contractors will perform each Activity above and there may be multiple contractors performing tasks within each Activity simultaneously. The Activities of the project will be completed in a sequential manner and each Activity should follow not more than 20 days behind its predecessor.

3.4 Installation of Wind Turbines

Installation of the wind turbines will include work space preparation, construction of foundations, and erection of wind turbines. In addition, the electrical collection system, transformer substation, and service building will be installed at this point in the sequence. Activities are described in Table 2 below.

	- Each wind turbine site will require clearing of approximately 1.0 acre
	of land but only a small portion of that land will be levelled, compacted
Work space	and prepared for the wind turbine foundation and a permanent crane
preparation	pad. The remaining area will be cleared and grubbed such that it can
	be used for component laydown and assembly of the crawler crane
	boom, but following construction the laydown and assembly area will
	be allowed to revegetate.
	- Mechanical excavation using backhoes and other earthmoving
Mechanical	equipment will be performed according to site specific ground
excavation and	conditions related to each wind turbine site. Controlled blasting
blasting	methods will be employed to remove rock in specific areas such as
	wind turbine foundations or difficult road cuts.
	- The casting of the concrete foundation is generally carried out in one
Foundations	continuous pour. Up to 700 cubic yards of concrete could be required,
Foundations	depending on conditions at each specific wind turbine site and they
	type of foundation selected.

TABLE 2: INSTALLATION OF WIND TURBINES

Turbine erection	- Once turbine foundations have been installed, mid-sized cranes (75 tons) will proceed to the first wind turbine site in a "cluster" or grouping of turbines where they will be used to erect the first two tower sections. These cranes will then move ahead to the next turbine site to repeat the operation. A heavy lift crane, with a capacity of 600 tons or more, will be used for the next step in the erection sequence. This large crane will be delivered to the initial turbine site on special transport vehicles and then it will be assembled at the prepared crane pad before it is used to erect the top tower sections and the nacelle. The hub and blades will be installed individually and in sequence either by the heavy lift crane or by the mid-sized cranes depending on the requirements of the erection contractor. Once the heavy lift crane has completed its work, it can be partially disassembled and then "walked"
	or driven along the ridgeline access roads to the other turbine sites.
Other Activities	
Installation of the medium voltage electrical collection system	- Medium voltage electrical lines will be buried within the turbine pad area to connect the wind turbine to the electrical switch on the wooden pole structure at the edge of the road. The collector lines will then be strung on wooden poles along the side of the road and terminated at the transformer substation.
Transformer substation installation	 Preparation and grading of surface, installation of grounding equipment and security fencing. Installation of transformers and electrical protection devices.
Service Building installation	 Excavation and casting of a concrete slab foundation, then construction of the building, the dimensions of which are approximately 50 feet by 70 feet.

3.5 Transmission Line

Construction of the proposed 115 kV transmission line will consist of two main activities. The first activity is the clearing of vegetation, followed by the installation stage. Implementation of these two activities will be done by section (e.g., Mile 0 to Mile 1.5), according to site conditions. An on-site project manager will dictate the day to day activities during both stages. The project manager's responsibilities include ensuring compliance with all applicable environmental standards and conditions of agency permits.

The 115 kV transmission line will consist of an up to 150-foot-wide ROW cleared of overstory vegetation through the working forest. For the portions of the proposed transmission line route adjacent to existing ROW, a clearing 125 feet wide is necessary. A portion that passes through state-owned land will be 100 feet wide, and the last portion of the line, approaching the grid interconnection at Bigelow Substation, will be underground in the shoulder of Route 27 and the substation driveway.

Pole structure construction work areas will not be grubbed or cleared of brush, unless leveling of the area is required. The only soil disturbance will be associated with the drilling/excavation of a hole for the installation of poles and, in some cases, due to the need to level the work area or for access along and adjacent to the ROW. Appropriate erosion and sedimentation control measures will be installed prior to ground disturbance, as determined during the site walk-through.

After clearing and preparation of the ROW, the first step in transmission line construction is to erect the poles. The primary pole structure will be wooden H-frames which consist of two in-ground poles connected by cross members. Some poles will be erected by drilling a hole with an auger, placing the pole in the hole and backfilling around the pole with any excess soil material. This backfill is tamped in (or packed down) to provide a firm base. Other poles will be erected using a small excavator to excavate approximately 5.5 cubic yards of material, allowing each pole to be placed up to 10 feet deep. The excavated area around the poles will then be backfilled. This backfill is also tamped in to provide a firm base. The use of heavy earth moving equipment such as bulldozers will not be required. In all cases, poles are buried to a depth equalling 10 percent of their length, plus two feet (for example, an 80-foot pole would be buried 10 feet [8 feet plus 2 feet]).

It will likely be necessary to blast ledge and large rocks at a number of locations during construction of the 115 kV transmission line. Blasting will be limited to pole locations where bedrock is exposed or shallow, and may be necessary to move or break up large boulders in order to provide access to pole locations.

On occasion, it may be necessary to create level work pads for the equipment in order to allow for proper (vertical) and safe installation of pole structures. In most cases appropriate topography exists. However, in locations where the terrain is not level, it is expected that a level working area will need to be created by pulling material (rocks and soil) from the area immediately adjacent to the pole location to create level and safe working conditions. These activities will be limited to only those places where the topography is too steep to allow equipment to level itself. All necessary erosion and sedimentation control measures will be installed at areas requiring levelling and will be left in place until the area is restored to original contours and stabilized.

Guy wires will be anchored in the ground and attached to angle pole structures to off-set any tension that is transferred from the conductor (electrical wire) to each angle pole. Anchors are generally screwed into the ground or buried and attached to steel cables, which are attached directly to the poles. All necessary erosion and sedimentation control measures will be installed at anchor locations and will be left in place until the area is stabilized.

After installation of cross-arms and the horizontal insulators which hold the conductors, the next step involves running a pull line (a rope known as a "p-line") along pulleys attached to each insulator. In all sensitive areas, the p-line will be pulled across the resource by construction personnel "walking" the line across, to avoid unnecessary crossing of the resource by construction equipment and to minimize impacts. This is particularly true along streams and larger wetlands. The p-lines are then connected to the conductors, which are pulled from pole to pole until they are run the entire length of the line. The last step involves attaching the conductors into each insulator.

The time needed for the installation of each pole structure (including excavating, placing the pole, backfilling, seeding, and mulching) is less than one day. To the extent possible, work within inundated or saturated wetlands will be limited to the winter months to take advantage of frozen ground conditions. All work areas will be restored and stabilized after construction work in those areas is completed.

3.6 Restoration

After construction, the majority of the area used for the installation of the wind turbines will be allowed to revegetate; only the areas occupied by turbine foundations and the crane pad will be permanently disturbed area. Road widths will be maintained only to a final width of 16 feet. All other temporary work areas (such as overburden and other materials storage, etc.) will be allowed to revegetate. The specific restoration measures, where appropriate, will be done according to the specific characteristics of the site.

3.7 Erosion and Sediment Control Implementation

The best method to limit erosion and sedimentation is to prevent it from occurring by protecting exposed soils or sensitive areas. The placement and types of erosion control measures will be determined during the preconstruction walk-through. The following general sequence of work will be followed to mitigate the potential for erosion of exposed soils and/or discharge of sediment-laden water from the work area.

- Conduct a walk-through of the construction areas to establish limits of work for construction activity; identify and mark sensitive resources, seep areas, springs, and the location of travel lanes.
- Complete and stabilize with gravel any needed access road improvements.
- Install and stabilize temporary equipment crossings over wetlands and waterbodies, in accordance with Section 5.0 and the BMPs.
- Clear timber and brush.
- Grubbing only where necessary.
- Divert off-site (clean) runoff away and through the construction area without mixing with on-site (sediment laden) runoff).
- Install silt fencing, stump grindings, mulch filter berms, diversion berms, and sediment traps.
- Construct temporary or permanent water bars (or rubber strips), if needed, and stabilize in accordance with Section 6.0 and the BMPs.
- Level and stabilize construction areas and conduct any blasting, as needed.

- Pump or divert excavation seepage and runoff to temporary sedimentation trap(s), prior to discharge to a well-vegetated upland area. Control and direct runoff from the excavation areas using water bars, berms, or hay bales.
- Monitor any paved public road(s) used for access, for signs of tracking and spilling of spoils on the roadway. Construct a stabilized construction entrance if required.
- Complete construction and final grade.
- Stabilize upon reaching final grade or in areas where grading activities temporarily cease for a period of at least 21 days with mulch, stone, and/or erosion control mix.
- Stabilize disturbed soils associated with temporary wetland and stream crossings in accordance with the Section 10.0 and the BMPs within 48 hours of removal of the temporary crossing.
- Loam, seed, mulch, and anchor all exposed soils, as necessary, within 7 days of final grading in accordance with the Section 10.0 and the BMPs.

3.8 Seepage Areas and Springs

Seep areas and springs will be identified in the pre-construction walk-through to the extent possible. During construction, additional seep areas and springs may be encountered, especially in large cut areas. The following measures will be implemented where such conditions occur:

- Review the proposed profile and determine if an adjustment of the profile can be made to elevate the section of roadway over the wet seepage area. If so the design profile should be readjusted, being cautious to remain within the basis of design parameters established for the established roadway. A rock blanket shall be placed below the roadway subgrade to maintain subsurface drainage.
- Grub the wet area The grubbing should attempt to remove the organics directly under the roadbed area only and in accordance with the geotechnical engineering report.

- For isolated seep areas, install a seep levee to contain and divert the seep around the construction area. A seep levee is a u-shaped berm that can be constructed with sandbags, Filtrexx Sock, or riprap. The seep levee will outfall into a temporary slope drain. See Final Development Plan Application, Appendix F – Design Drawings – Roads and Turbines, detail 2, sheet 0026 and detail 1, sheet 0027.
- For a continuous seep area, install a temporary channel or diversion berm along the toe of the cut slope where the seep occurs. A check dam, which can be constructed of sandbags, Filtrexx Sock, or riprap, is to be placed at the outlet of the diversion and will outfall through a temporary slope drain. See Final Development Plan Application, Appendix F Design Drawings Roads and Turbines, detail 2, sheet 0027.
- For the permanent conditions, place fabric, drainage stone, and pipe, as applicable to the situation, as shown in the Final Development Plan Application, Appendix F – Design Drawings – Roads and Turbines, details on sheets 0020 and 0023.
- Install cross culvert In most areas at least a 12-inch culvert will be installed within or below the stone bedding. This may be done concurrently with the stone placement or as a subsequent step. However, if done later, the fabric will need to be cut and repaired.
- Place and secure fabric over the stone (unless stipulated otherwise by the geotechnical representative).
- Cover fabric with common borrow to provide at least 24 inches of cover over the top of the culvert.
- Install the riprap culvert inlet and outlet aprons and channel including the flow dispersion lip for the culvert outlet.

4.0 STANDARDS FOR CONSTRUCTION

4.1 Travel Lanes, Laydown, and Yarding Areas

The following six standards apply to the location of travel corridors and the location and/or upgrade of all roads, yarding areas, and construction laydown areas or work pads.

Vegetated Buffers Between Work Areas and Water Resources. Where travel lanes or work areas will be located near water resources, such that material or soil may be washed into them, these disturbances will be set back from the edge of the water resource to maximize the amount of vegetated buffer between the disturbed area and the resource, to the extent practicable. These "filter strips" will consist of an area of undisturbed vegetation between the edge of disturbed area and/or silt fence/hay bale barriers placed to intercept any sediment load in runoff water before it can enter the resource area. Table 3 below provides the recommended widths for the filter strips according to the slope of land between the edge of the resource and any exposed soil.

TABLE 3. RECOMMENDED FILTER STRIP WIDTHS BETWEEN DISTURBE	D
AREAS AND WATER RESOURCES	

Slope of Land Between Disturbance and the Resource (Percent)	Width of Filter Strip* (Feet)
0	25
10	45
20	65
30	85
40	105
50	125
60	145
70	165

*Measured along surface of the ground

2. Safe Work on Steep Slopes. Wherever possible, construction equipment will either avoid steep slopes or proceed across the slope in a safe manner to avoid excessive disturbance of vegetation and soils. Equipment will not travel straight up or down any slopes with a grade steeper than 10 percent, except where necessary due to safety concerns and/or terrain and other access constraints.

3. Slope Stabilization. Where travel lanes or construction areas cross slopes, the area will be properly stabilized and maintained to retain the existing surface and shallow subsurface drainage to the extent practicable.

4. Finish Grade Slope Restrictions. Slopes of levelled areas will be no steeper than 2 horizontal to 1 vertical (2:1) unless otherwise indicated on the drawings. The drawings provide for alternative cut/fill slope construction methods for slopes ranging from 3:1 to 1:5 (in rock cuts).

5. *Minimize Wetland and Water Resource Crossings.* Rivers, streams, and wetland areas will be crossed, where necessary, at right angles to the channel and/or at points of minimum impact. To ensure that natural drainage patterns will not be altered or restricted as a result of construction activities, crossings will be designed and constructed according to specific standards outlined below.

6. *Limit, Monitor and Restore Work in Waterbody Buffers.* In cases where mobilized tree harvesting equipment (feller-buncher) is being used to remove trees, their limited reach may require access ways within waterbody buffers to enable cutting and removal of large trees, if necessary. Each of these situations will be reviewed on a case-by-case basis and the various options for vegetation cutting will be considered to minimize disturbance in the buffer zones. On the collector and transmission line ROWs, plant species that are not capable of growing into the electric conductors (i.e., shrubs) will remain following the completion of clearing activities. Temporary erosion and sedimentation control measures will be implemented along the access ways, as required. As will be the case along either electrical ROW, ground disturbance caused by the use of harvesting equipment will be repaired by returning the ground to its original contour, as needed, and seeding and mulching any bare ground.

4.2 Stream or Wetland Crossings

The following standards apply to all unavoidable stream, drainage way, or wetland crossings encountered while accessing the proposed work areas.

4.2.1 Types of Crossings Used

The type of crossing used for access is dependent on: the purpose and use of the crossing; the nature of the resource being crossed; ground conditions present at the time of construction; and construction materials available. Some planning guidance is provided below. The appropriate means and location of the crossing will be determined at the time of the formal walk-through.

- Permanent culverts will be used only where long-term, continued, and frequent access is required, such as the new access roads to turbine sites. No permanent culverts will be installed along the transmission line ROW.
- Temporary crossings will be used at all other locations. Temporary bridges or equipment mats must be used to cross any streams, drainage ways, or wetlands that contain: (1) flowing water; (2) standing water; (3) saturated soils; or (4) organic/mucky soils. No equipment will operate in or travel through the water or on soft or saturated wetland soils.
- The use of corduroy as crossing material will be limited to wetlands not anticipated to have flowing or standing water or saturated soils during the construction period. The use of corduroy will be limited and must be pre-approved by a TransCanada representative. Equipment mats may be used in wetland crossings to reduce soil disturbance, especially when saturated soils or standing water are present. Typically, equipment mats are removed when construction is complete, during final restoration.
- All temporary waterbody crossings must be temporarily stabilized upon installation and permanently stabilized, as needed, within 48 hours of removal, unless specified otherwise.

4.2.2 Construction in Wetlands

Construction in the turbine areas will minimize impacts wetland areas to the extent possible, however wetlands found within the proposed new road area will be permanently impacted with fill. Specialized construction techniques to help maintain hydrology in these areas have been recommended by the state soil scientist, and these methods are being proposed by TransCanada (see Figures 1 and 2 in Appendix C for design details of the rock "sandwich" roadway design and typical wetland road crossing section).

Work in the transmission line construction area will largely avoid permanent impacts to wetlands, and most wetland impacts will be temporary in nature, and primarily from construction access. Construction on the transmission line will also be conducted during the winter, as the schedule allows, taking advantage of frozen ground conditions. Otherwise, wide tracked or balloon-tired equipment will cross or work in wetlands using timber equipment mats. Where structures are to be placed in wetlands, topsoil will be excavated first, and stockpiled separate from subsoil. Soils will be replaced into the excavated area in the opposite order they were removed. After pole installation, topsoil will be restored to the original surface grade, except where mounding around a structure is necessary for structure stability.

4.3 Construction in Buffer Areas

Vegetative buffers of 100 feet (as measured from the top of both banks) will be established and maintained on perennial streams and rivers. In the turbine construction area, project features generally cross these resources in a perpendicular fashion, and will only impact the buffers at these crossing areas. Where perennial streams and rivers are crossed by the 115 kV transmission line, it also typically crosses the resources in perpendicular fashion, and structures will only be located within these buffers as engineering standards require. Minimal soil disturbance will occur in the buffers. No vehicular traffic will be allowed in the buffers other than that necessary to remove trees and construct and utilize temporary equipment crossing bridges authorized during the walk-through. As described in Section 4.1, three access ways may be required within these buffers during initial clearing to enable tree harvesting equipment to reach all trees that need to be removed. Each of these situations will be reviewed on a case-by-case basis and the various options for vegetation cutting will be considered to minimize disturbance in the buffer zones. All appropriate erosion and sedimentation controls will be implemented and maintained along these access ways during and following construction.

Construction activities within these waterbody buffers on the transmission line will be limited to the cutting of only species capable of growing into the electric conductors and large snags that are greater than 8 to10 feet tall (Figure 3, Appendix C). Cutting of these trees will be done by hand or by a feller-buncher reaching into the buffer from outside the zone, if possible, and from the three access ways as needed. Erosion control barriers will be established and maintained along the access ways within the buffers and along the approach to all stream crossings and will be supplemented, as appropriate, by water bars and/or erosion control barriers extending outside the buffer zone. The use of herbicides in waterbody buffers will not be allowed.

5.0 INSTALLATION OF CROSSINGS

5.1 Bridges

5.1.1 Materials

Typically bridge construction will entail the use of log stringers or equipment mats as construction materials covered by decking planks or equipment mats.

5.1.2 Sizing

Table 4 illustrates the log sizing requirements depending on the span and anticipated loads.

	Minimum Log Diameter*		
Span	(80,000 lb. Load) (40,000 lb.		
8 ft.	16 in.	12 in.	
12 ft.	18 in.	14 in.	
16 ft.	20 in.	16 in.	

TABLE 4. LOG BRIDGE STRINGER REQUIREMENTS

Wheel guards: 10" diameter

Size of deck planks: 4" x 12" x 12'

Assume 6 stringers at 24" centers

5.1.3 Positioning

Figures 4 and 5 in Appendix C illustrate the proper use and installation of crossing bridges.

- Temporary bridges will cross streams at right angles to the channel at a location with firm banks and level approaches whenever possible.
- At the crossing location, the ends of the stringers will extend at least two feet onto firm banks or several feet into the upland edge of a wetland to ensure a dry, firm approach onto the bridge.
- Mats, corduroy logs or a stone pad installed on top of geotextile fabric will be used, where necessary, to provide a smooth transition for equipment travel from the adjacent ground or temporary road onto the bridge.
- Temporary bridges for the Kibby Expansion Project will not require vertical support piers or abutments in a stream or inundated wetland.

5.1.4 Maintenance

Bridges will be continually monitored to ensure that they are stable and functioning correctly. Bridges will be kept clean and any accumulated soil materials will be removed and disposed of and stabilized in an upland location. The material will not be scraped and shoveled into the water resource. The contractor will replace timbers or decking in poor condition as soon as deterioration is observed. At a minimum, the contractor will be responsible for inspecting all bridges once per week and will keep a log of all changes, improvements, and other maintenance performed.

5.1.5 Removal

Bridges will not be removed until their use is no longer necessary. Tree cutting and final restoration work on and around the stream banks will be completed prior to removing the bridge from the crossings. The banks of streams and drainage ways will then be graded back to original conditions. Exposed soils on the banks and within 100 feet of the crossing will be stabilized using seed and mulch. Banks of drainage ways (excluding streams and rivers) that are expected to receive high flows will be stabilized with seed and curlex or jute matting (Figure 6, Appendix C). All bridges will be removed from the ROW upon completion of construction.

5.2 Culverts

Permanent culverts may be installed to replace existing damaged or malfunctioning culverts along existing access roads, and also in several locations along the proposed new access roads to maintain existing drainage. Only one perennial stream will require a permanent culvert crossing in the turbine construction area. No permanent culverts will be required for equipment access within the transmission line ROW. Temporary culverts may be installed as a means of equipment mat support for wide or deep temporary stream crossings.

5.2.1 Materials

Permanent culverts will be either corrugated metal or plastic pipe. Temporary culverts will be corrugated metal, plastic pipe, or lumber ties. Chemically-treated wood will be not used.

5.2.2 Sizing

Culvert size will be determined by the largest pipe diameter equal to the undisturbed cross sectional area of the bank full condition of the stream. It should fit into the existing channel without major excavation of the waterway channel or without major approach fills. If a channel width exceeds 3 feet, additional pipes may be used until the cross sectional area of the pipes approaches that of the existing channel. The minimum size culvert that may be used is an 18-inch diameter pipe. The maximum flow capacity of the culvert(s) ("bank full") will be determined at highest flows or will be approximated during periods of lower flows using the apparent natural high water marks remaining on the stream banks.

5.2.3 Positioning

The following guidelines will be used for the positioning of all permanent and temporary culverts:

Culverts will be placed to allow for the crossing to take place at right angles to the channel to ensure that natural drainage patterns will not be altered.

Culverts will be placed at the point of narrowest crossing and where firm banks and level approach slopes are available. Slopes should not exceed 1.5 to 1.

5.2.4 Installation

The following guidelines will be used for the installation of all permanent and temporary culverts:

- Culverts will be of sufficient length to allow both ends to extend at least one foot beyond the toe of any fill used to cover the culvert.
- Culverts will be bedded on firm ground. Supplemental use of geotextile with gravel can be used to create this firm base. Permanent culvert installation will include firm compaction of the foundation and the fill around the sides of the culvert. Compaction will be done in no less than 8-inch lifts.
- Both the inlet and outlet ends of the culverts will be set at or slightly below the natural stream bottom to allow passage of fish and other aquatic life at all levels of flow. At no point will either end of an installed culvert be positioned in the air out of the water.
- Multiple culverts must be offset in order to concentrate low flows into the culvert within the natural channel.

- Fill used to bury the culvert will be compacted at least half-way up the side of the culvert for its full length to ensure that flowing water will not undermine the culvert.
- Culverts will be covered with fill to a depth of at least one foot or one-half the culvert diameter, whichever is greater.
- Road fill at the upstream (headwall) and downstream (outfall) ends of culverts will be armored with rock rip-rap to protect the road fill from being eroded by the action of water or road traffic. This material will be installed up to the level of anticipated high water.
- In areas where the streambed appears highly susceptible to erosion, the streambed at the outlet end of the culvert will be lined with riprap to prevent erosion and potential streambed scour. Table 5 indicates the distances away from the culvert to install such riprap. Figures 7 and 8 in Appendix C illustrate possible culvert installation options with inlet and outlet protection.

Culvert Diameter (Inches)	Length of Rock Protection From Culvert (Feet)
12 – 20	7
21 – 24	9
30	11
36	13
42 – 48	18
54 - 60	24
66 – 78	32

TABLE 5. CULVERT SIZE - LENGTH OF ROCK PROTECTION

5.2.5 Removal

Temporary culverts used to support bridge spans will be removed from the stream channel and ROW at the same time the span is removed. Where damaged or malfunctioning culverts were replaced, the new culverts will be left in place.

5.3 Mats (Timber, Construction, or Equipment Mats)

Equipment mats will be used for temporary access across streams and wetlands. TransCanada will require the contractor to ensure that adequate equipment mats (both in terms of quantity and quality) are present at the project site prior to construction. Additional sources of equipment mats will be identified should the effort require more mats than originally anticipated.

5.3.1 Materials

A number of differently sized and constructed equipment mats are typically available and the appropriately sized mats will be used for the each crossing. For example:

Longer mats will be used for spanning the wider crossings. This practice avoids the need to install additional mats within the crossing area in order to support the "span" mats. Mats will be in good condition to allow for their "clean" installation and use. Using mats with timbers and cables in good condition minimizes the potential for breakage during installation. Furthermore, using materials in good condition helps to prevent mats from becoming imbedded in mud and reduces the need to drag them in or out of the resource versus carrying them above the resource. Mats with partial/short timbers joined end to end will not be used to cross stream channels.

5.3.2 Installation

Illustrations of the proper use and installation of mats are depicted in Figures 9 and 10 of Appendix C.

Whenever possible, mats will be carried and not dragged. Dragging mats creates more soil disturbance, which can result in additional erosion control or final restoration work. At the crossing location, the ends of the timber mats will extend at least two feet onto firm banks or several feet into the upland edge of a wetland to ensure a dry, firm approach onto the mats.

For wetland crossings that require multiple mats, mats will be oriented with their longest dimension perpendicular to the direction of travel. This configuration reduces the potential for the mats to work into the wetland soils as vehicles cross, thus reducing disturbance of the wetland surface.

Mats used as temporary bridges for the Kibby Expansion Project will not require support piers or abutments to cross a stream or inundated wetland. The contractor will use appropriately sized and spaced timbers (Table 4) to span the resource and support the mats. In certain instances, a culvert may be used to provide midstream support if more than one mat is required to cross a long span. Support culverts will be oriented parallel to the direction of flow and fish passage maintained.

At "dry" crossings where no water is present or anticipated during project construction, the mats may be placed directly onto the sensitive natural area in order to prevent excessive rutting, provided stream banks and bottoms are not altered.

5.3.3 Maintenance

Matted crossings will be continually monitored to ensure that they are in good condition. Mats will be kept clean and any accumulated soil materials will be removed and disposed of and stabilized in an upland location. The material will not be scraped and shoveled into the water resource. Mats which become imbedded will be reset or layered to prevent mud from covering them or water passing over them. The contractor will replace mats as soon as deterioration is observed. At a minimum, the contractor will be responsible for inspecting all matted crossings once per week and will keep a log of all changes, improvements, and other maintenance performed.

5.3.4 Removal

Mats will not be removed until their use is no longer necessary. Specifically, all final restoration work along the adjacent ROW will be completed prior to removing the mats from the crossings. All mats will be removed from the ROW upon completion of construction. Exposed soils within 100 feet of the crossing will be stabilized.

5.4 Corduroy

Corduroy crossing use should be limited to those situations when there are no other readily available options, and only in consultation with TransCanada and agency staff (LURC or DEP, as applicable, and USACE).

5.4.1 Materials

Corduroy material will consist of de-limbed trees or logs. The logs must have a diameter greater than three inches at the small end and lengths greater than 18 feet. Shorter length material may be used only as described below. In general, corduroy crossings will only be used when the use of equipment mats is not practical.

5.4.2 Positioning

The use of corduroy as crossing material will be limited to wetlands which are not anticipated to have flowing or standing water or saturated or soft soils during the construction period. Corduroy will be placed perpendicular to the direction of travel. Corduroy will be placed at the point of narrowest crossing and where firm ground and level approach slopes are available. Corduroy may also be used to help stabilize and level the approaches to a bridge crossing. Illustration of the proper use and installation of corduroy logs is depicted in Appendix C, Figure 11.

5.4.3 Installation

Corduroy will be placed with the longer length pieces laid down first. Once a thick base of corduroy has been laid, pieces shorter than 18 feet can be used to fill gaps and raise the elevation of the corduroy to provide for a more stable crossing.

5.4.4 Maintenance

Corduroy will be continually monitored to ensure that it is functioning correctly. Corduroy logs will be kept clean to the maximum extent practical and when possible, accumulated soil material will be removed and disposed of and stabilized in an upland location. The material will not be scraped and shoveled into the water resource. Corduroy that becomes imbedded in mud will be replaced by timber mats or other more suitable crossing materials as soon as significant surface disturbance is observed. At a minimum, the contractor will be responsible for inspecting all corduroy logs once per week and will keep a log of all changes, improvements, and other maintenance performed.

5.4.5 Removal

Removal is the reverse of the installation process. Once the corduroy has been removed from the crossing, it will be moved off the right-of-way and burned, chipped, or cut into smaller pieces consistent with state and local laws. If cut or chipped, the material may be spread and distributed in upland areas. If this approach is taken, all materials will be disposed of in accordance with the Maine Slash Law (Appendix F).

6.0 SURFACE WATER DIVERSION STRUCTURES (WATER BARS)

A number of above-ground structures or techniques are available to divert water out of travel ways and work areas in order to prevent subsequent runoff and erosion. Water bars, also called slope breakers, may be required in a limited number of locations in the Kibby Expansion Project construction area to redirect water moving down a prolonged steep slope with disturbed soils, into adjacent vegetated upland areas (i.e., filter strips).

6.1 Materials

Water bars will be constructed by excavating or moving and shaping soil from within the ROW to form a shallow cross-drainage swale. The excavated material will be used to form an elevated bar immediately downslope of the swale. Permanent rubber water bars can also be installed per detail 9 on sheet 0023, in the Final Development Plan Application, Appendix F – Design Drawings – Roads and Turbines.

6.2 Positioning

Water bars will be installed immediately above and along steep pitches in the construction area, and below seepage areas on natural or cut banks, as determined during the preconstruction site walk-through and also during construction as appropriate situations arise. They will be sited to take advantage of existing vegetation for filtering and slope away from the areas susceptible to erosion. The interval for installing diversion structures depends on the slope of the area, the soil permeability of the soils, and saturated soils. Generally, steeper slopes require shorter distances between water bars in order to control the higher volume and velocity of surface water flow. Water bars will be sized in anticipation of greater flows resulting from snow melt, spring runoff, and storm rains. Table 6 contains typical recommended distances between installed structures depending on slope. For spacing of permanent rubber waterbars, see Final Development Plan Application, Appendix F – Design Drawings – Roads and Turbines, detail 9 on sheet 0023.

Slope (Percent)	Spacing (Feet)
0-2	250
3 – 5	135
6 – 10	80
11 – 15	60
16 – 20	45
21+	35

TABLE 6. RECOMMENDED DISTANCES BETWEEN WATER DIVERSION STRUCTURES

6.2.1 Installation

Water bars will be installed at 30 degrees angled down grade. The shape of the backside portion of the structure will have a reverse slope of about 3 percent. Use of a pop-level is recommended to ensure that drainage is away from the areas susceptible to erosion. Water bars will be constructed with rounded mounds and dips to allow for firm compaction and to allow re-vegetation. Illustrations of the proper installation of water bars are provided in Appendix C, Figures 12 and 13.

The inlet end of water bars will extend beyond the edge of the area susceptible to erosion, so that it fully intercepts water flows that may flow onto the area. The outlet end of the structure will extend out far enough to prevent water from flowing around and re-entering the work area. The discharge ends will outlet into a vegetated filter strip. Where heavy flows are encountered or anticipated, the outlet end of the water bar will incorporate an apron of rock and/or geotextile fabric to reduce water velocities and prevent erosion.

Where the water bar is within 100 feet of a stream or wetland, a small, excavated settling basin or ditch turnout will be incorporated to reduce the velocity of flows and the continued movement of sediment downslope. In addition, stone check dams, silt fencing or staked hay bales will be installed at the outlet of the diversion structure, where vegetated filter strips are narrow or sparsely vegetated, in order to prevent sediment from entering water resources. Additionally, a temporary mulch liner (anchored erosion control blanket) will be installed immediately upslope of the sediment barrier to reduce the erosion potential of the concentrated flow. The proper installation of stone check dams and other swale stabilization measures is shown in Appendix C, Figure 14.

6.2.2 Maintenance

Maintenance is critical to the effective functioning of the diversion structures due to repeated travel over them. The structures will be re-excavated or graded to ensure the interception and redirection of water runoff, as the structure becomes flattened or rutted. The outlet ends, sediment basins and sediment barriers will be maintained by clearing away any potential blockages and accumulated sediments. In areas where silt fence or hay bale barriers are used, the barriers will be replaced with stone check dams if inspections during construction indicate that channelized runoff is undercutting the barrier. The contractor will be responsible for inspecting all diversion structures in active construction areas weekly and will keep a log of all changes, improvements, and other maintenance performed.

6.2.3 Removal

After the completion of the construction project, removal of these structures is not a requirement. Water bars can be left in place provided they have been suitably stabilized with seed and mulch. Hay bale or silt fence barriers at the outlet of the structure will be removed when these areas have vegetative cover.

7.0 SEDIMENT BARRIERS (STRUCTURAL MEASURES)

7.1 Introduction

The standards and procedures outlined in this section are meant to address a majority of the situations encountered during the Kibby Expansion Project construction activities. For additional information on sediment and erosion control methods and techniques, or to address a particularly problematic situation, the information in this section may be supplemented by the DEP's <u>Maine Erosion and Sediment Control BMPs</u>, dated March 2003.

The use of properly installed erosion and sediment control barriers is the most fundamental and critical component for stopping and controlling erosion during the Kibby Expansion Project construction. Erosion control barriers include silt fences, and/or erosion control mix berms. In some cases, these barriers may be deemed unnecessary due to factors including slope and the presence of filter strips within project boundaries. Typically, earth work near water will require the use of at least one of these types of barriers or some combination of them to effectively prevent and/or control erosion near water resources. Installation and diligent maintenance of these barriers serves the following purposes:

- Ensures the environmental integrity of those upland and water resource areas not designated or permitted for disturbance. Specifically, it maintains the onsite vegetative community and water quality of the surface water within the watershed.
- Ensures compliance with all applicable federal, state, and local environmental and land use regulations or permit conditions.

Generally, erosion control mix berms are a preferred barrier to silt fencing for this project because it is generally easier to install, obtain, and transport; it is made of native organic materials; and it is easy to remove and stabilize.

7.2 Use of Silt Fence

7.2.1 Materials

Silt fencing is provided by a number of manufacturers and is generally a synthetic fabric preattached to wooden staking. The fabric must be pervious to water allowing a flow-through rate of 0.3 gallon per square foot per minute. The fabric must contain stabilizers and ultraviolet ray inhibitors to allow it to sustain exposure of a minimum of 6 months. The height of the filter fabric must not exceed 3 feet above the ground surface.

7.2.2 Placement

Silt fencing may be utilized at the edge of any planned work area or area which will incur soil disturbance. It will be installed on slope contours to intercept sheet flow, maximize ponding, and detain sediment from entering water resources or leaving the project site. It will be installed prior to construction activity that results in exposure or disturbance of soil. The amount of silt fencing and placement must be selective given the size of the Kibby Expansion Project construction area; however, it will be used in amounts sufficient to meet potential changing conditions in a proactive manner. The placement of silt fence along the construction area will be determined during the preconstruction walk-through. Silt fencing will be used, as appropriate, in the following locations:

- Along all access roads or work areas that are within 100 feet of water resources or wetlands.
- Along all access roads or work areas in upland settings that encounter seepage moving across slope.
- Around all stockpiled soils.

In general, the placement of silt fencing is appropriate when:

- Serving a drainage area of no more than 0.25 acre per 100 feet of silt fence length.
- The maximum slope length behind the fence is 100 feet or less.
- The maximum gradient behind the fence is 50 percent or 2:1 horizontal/vertical.
- Where the filter strip is not able to meet the optimal width.

7.2.3 Installation

The following installation guidelines are the minimum which will be implemented; however, appropriate adjustments to silt fence installation will be made as conditions change during construction. Illustrations of the proper use and installation of silt fence are provided in Appendix C Figures 15 through 18.

Silt fencing will be placed an adequate distance (6 to10 feet) beyond the toe of the slope, where there is sufficient room to allow for sediment accumulation between the disturbed area and the down-gradient water resources. If there is not sufficient room to place the silt fence an adequate distance beyond the toe of the slope, the barrier will be installed along the contour, within reason. The goal is to slow and pool sediment-laden runoff to allow fine sediments to settle out before the runoff enters a water resource. The ends of the barrier will be turned up-slope to maintain the barrier volume.

A trench will be excavated approximately 6 inches wide and 6 inches deep on the up-slope side of the silt fence alignment. The lower edge of the silt fence fabric will be entrenched for a distance of at least 6 inches up-slope and then back-filled. Should frozen or rocky ground conditions prevent the effective or practical use of trenching, materials such as bark/wood chips, wood fiber mulch, or a soil erosion control mixture can be used. This material is to be mounded on top of at least 8 inches of filter fabric placed on the ground surface, which would otherwise be trenched.

Silt fence will be installed in a continuous roll to avoid a joint between different pieces of fence. If joints are necessary, filter fabric will be "spliced" together at a support post, securely sealed, and with a minimum of 6 inches of overlap. Splicing rolls of silt fence entails twisting end posts together, creating a continuous section of silt fence.

Support posts will be placed on the down-slope side or the side closest to or facing the water resource. The posts will be placed 6 feet apart (a maximum of 10 feet may be acceptable in some locations), and driven securely into the ground, typically about 18 inches deep. If ponded water behind the silt fence is anticipated or occurs, additional stakes will be added for support and attached to the fabric with staples or zip-ties.

Silt fence will not be installed in streams or drainageways where water flow is present or where concentrated flows that could undercut the barrier are anticipated.

7.2.4 Maintenance

Once a week, or after rainstorms producing at least ½ inch of rainfall, whichever is more frequent, the contractor will inspect all temporary erosion and sediment control barriers. During a prolonged rainfall, barriers will be inspected at least daily. Such inspection is necessary to ensure that the barriers are functioning properly as well as identifying new areas requiring installation. A maintenance log will be kept of all erosion control changes, improvements, and maintenance performed.

If any barriers are not functioning properly, they will be repaired or replaced. A sediment control barrier is not functioning if:

- Water is flowing around the sides or under the barrier.
- Soil has built up behind the barrier to the point more than half-way up the fence.
- There is excessive sag in the fence.
- There is evidence of sedimentation such as gully erosion, slumping of banks, or the discoloration of water outside of the perimeter silt fence.

Corrective measures include removing accumulated sediment from behind the barrier, restaking, extending the ends of the fence, installing another fence further upslope, or replacing the fence with a stone check dam in areas of significant concentrated flow. Soil removed from behind a barrier will be spread in an upland area and will be stabilized with mulch.

7.2.5 Removal

Installed silt fence will be removed once it is evident that the soils have become stabilized and the potential for erosion no longer exists, generally reflected by a healthy growth of vegetation over at least 90 percent of the stabilized area (Section 10.0). In most cases, the silt fence will not be removed until at least one growing season has past. Removal of silt fence will be coordinated with TransCanada or its designated representative.

Any ridges or mounds of soil or caught sediment remaining in place after the silt fence has been removed will be leveled-off to conform to the existing grade. Any newly exposed soil that may erode will be seeded and mulched. All removed silt fence will be properly disposed of at a licensed solid waste facility.

7.3 Use of Erosion Control Mix Berms

Erosion control mix berms are practical and effective in most situations, but are especially suited for frozen ground, outcrops of bedrock, and forested areas with many roots where silt fence or hay bales cannot be effectively anchored. Erosion control mix consists primarily of organic materials such as wood chips, waste wood, bark mulch or similar materials. Construction debris and reprocessed wood products are not acceptable for use in erosion control mix. Erosion control mix can be manufactured on or off site, and will contain a well-graded mix of particle sizes and may contain rocks up to 4 inches in diameter and some soil. TransCanada anticipates manufacturing erosion control mix on site, utilizing stumps and other clearing debris. Any erosion control mix used on the Kibby Expansion Project will have:

- organic matter content between 80 and 100 percent (dry weight);
- 100 percent of particles passing a 6-inch screen;
- the organic portion will be fibrous and elongated,
- only small proportions of silts, clays, or fine sands; and
- pH between 5.0 and 8.0.

When using erosion control mix, a continuous berm is placed between the earth work and the resource being protected as discussed below.

7.3.1 Installation

Illustration of a cross-section of a properly installed erosion control mix berm is provided in Appendix C, Figure 23. As with other barriers, to be most effective these berms must be placed along the contour of the slope. It will be necessary to cut tall grasses or woody vegetation to avoid creating voids and "bridges" that may enable runoff and sediment to wash under the barrier. For erosion control mix berms on slopes less than 25 percent (4:1), the barrier must be a minimum of one foot deep and a minimum of 2 feet wide. On longer or steeper slopes, the barrier must be wider to accommodate additional runoff.

Erosion control mix berms will not be used at low points of concentrated runoff, below culvert outlet aprons, around catch basins and closed storm systems, in areas of forceful winds, and at the bottom of steep perimeter slopes that have large watersheds.

7.3.2 Maintenance

Once a week, or after rainstorms producing at least ½ inch of rainfall, whichever is more frequent, the contractor will inspect all temporary erosion and sediment control barriers. During a prolonged rainfall, barriers will be inspected at least daily. Such inspection is necessary to ensure the berms are functioning properly as well as identifying new areas requiring installation. A maintenance log will be kept of all erosion control changes, improvements, and maintenance performed. If any of the erosion control mix berms are not functioning properly, they will be repaired or replaced. A sediment barrier is not functioning if:

- Water is flowing around the sides or under the barrier.
- Soil has built up behind the barrier to the point more than half-way up the barrier or where there is excessive lean to the barrier.
- There is evidence of sedimentation such as gully erosion, slumping of banks, or the discoloration of water outside of the barrier.

Corrective measures include removing accumulated sediment from behind the barrier, restaking, extending the barrier at the ends, reshaping the erosion control mix berm, or installing another barrier further up-slope.

8.0 TREATMENT OF CONCENTRATED FLOW

Where runoff from disturbed areas was transported via concentrated flow, sediment traps or check dams were used to treat the sediment laden runoff before leaving the site.

8.1 Materials

Sediment traps are to be constructed of Filtrexx socks, as shown on detail 3, sheet 0026, in the Final Development Plan Application, Appendix F – Design Drawings – Roads and Turbines. The Filtrexx sediment trap was chosen to reduce the limit of disturbance in steep slopes as well as ease of installation and removal.

Check dams can either be constructed of stone or hay bales. Stone check dams are to be constructed of 2 to 3 inch stone. All hay bales are to either be wire bound or string tied. See Final Development Plan Application, Appendix F – Design Drawings – Roads and Turbines, details 3 and 4 on sheet 0027.

8.2 Placement

Sediment traps are to be placed at the proposed outfall locations of road-side ditches carrying concentrated sediment laden runoff. These sediment trap locations will be regraded into ditch turnouts or level spreaders once the road surface and cut slopes are stabilized. Sediment traps will also be installed, in some situations, at the toe of fill slopes where a channel is formed between fill and existing ground.

Check dams will be placed along the toe of fill slopes where a channel is formed between the fill slope and existing ground. A temporary diversion berm will divert off-site water around this toe of slope channel.

8.2.1 Installation

Filtrexx Sediment traps are to be installed per detail 3, sheet 0026, in the Final Development Plan Application, Appendix F – Design Drawings – Roads and Turbines, and manufacturers instructions. Sediment traps are to be installed with the outflow lip parallel to the existing contours.

Rock check dams are to be installed along channels and placed from downstream to upstream so that the toe of the upstream check dam is at the same elevation as the top of the downstream check dam. Rock check dams are to be constructed by piling 2 to 3 inch stone to a height of 2 feet with 2:1 sideslopes. Hand or mechanical placement will be necessary to achieve complete coverage of the ditch or swale and to ensure the center of the dam is lower than the edges. See Final Development Plan Application, Appendix F – Design Drawings – Roads and Turbines, detail 4, sheet 0027, for proper installation.

Hay bales shall be placed in a single row, across the swale, tightly abutting one another. All bales shall be either wire-bound or string-tied. Bales shall be installed so that bindings are oriented around the sides, parallel to the ground surface to prevent deterioration of the bindings. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After the bales are staked and chinked, the excavated soil shall be backfilled against the barrier. At least two stakes or rebars driven through the bale shall securely anchor each bale. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or re-bars shall be driven deep enough into the ground to securely anchor the bales. The gaps between bales shall be chinked (filled by wedging) with hay to prevent water from escaping between the bales. See Final Development Plan Application, Appendix F – Design Drawings – Roads and Turbines, detail 3, sheet 0027, for proper installation.

8.2.2 Maintenance

Once a week, or after rainstorms producing at least ½ inch of rainfall, whichever is more frequent, the contractor will inspect all sediment traps. During a prolonged rainfall, sediment traps will be inspected at least daily. Such inspection is necessary to ensure the sediment traps are functioning properly. A maintenance log will be kept of all erosion control changes, improvements, and maintenance performed. If any of the sediment traps are not functioning properly, they will be repaired or replaced. A sediment trap is not functioning if:

- Water is flowing around the sides or under the trap.
- Soil has built up in the trap to the point more than half-way up the trap or where there is excessive lean to the trap.

Corrective measures include removing accumulated sediment from inside the trap, restaking, enlarging the trap, re-orienting the trap, or installing another trap further up-slope.

For check dams, regular inspections must be made to ensure that the center of the dam is lower than the edges. Erosion caused by high flows around the edges of the dam must be corrected immediately. If evidence of siltation in the water is apparent downstream from the check dam, the check dam must be inspected and adjusted immediately. Check dams must be checked for sediment accumulation after each significant rainfall. Sediment must be removed when it reaches one half of the original height or before.

8.2.3 Removal

Sediment traps are to remain in place until all construction activities are complete and disturbed areas are stabilized. FIltrexx socks are to be removed and disposed of and the sediment trap footprint is to be re-graded into a ditch turnout or level spreader.

If it is possible, check dams are to be left in place permanently. Another option is to spread the material, i.e. stone or hay along the ditch invert to provide additional protection. In temporary ditches and swales, check dams must be removed and the ditch filled in when it is no longer needed. In permanent structures, check dams can be removed when a permanent lining has been established. If a check dam must be removed from a grass lined ditch, wait until the grass has matured to protect the ditch or swale. The area beneath the check dam must be seeded and mulched immediately after they are removed.

9.0 NONSTRUCTURAL EROSION CONTROL MEASURES

9.1 Nonstructural Measures Defined

Nonstructural measures can be either temporary or permanent methods used to cover exposed soil areas to prevent erosion from occurring. Often these techniques and materials are used on slopes along roads, areas where soil has been regraded, and generally areas where the soil has been exposed. Their purpose is to cover the entire area of exposed soil to prevent initial erosion of soil from a construction site. Examples of nonstructural measures include hay or straw mulch, erosion control blankets, brush-slash-tops, matting, or seeding. There are two types of nonstructural measures: temporary and permanent. Temporary measures are typically used during construction, while permanent measures are usually applied after construction is complete (i.e., restoration).

9.2 Importance of Nonstructural Measures

Nonstructural measures are important because they provide both temporary and permanent protective cover to exposed soils. Generally, they provide the first line of protection against erosion, and can be the most effective means of erosion prevention. This protection is important because exposed soils are easily eroded by wind or water. Some soils such as silts can easily be removed from a construction site by rainwater. The impact of individual raindrops on exposed soils can loosen soil particles, and these particles can then be carried off the work site by runoff and deposited into water resources including streams, rivers, wetlands, ponds, and lakes. Silt particles stay suspended in water for prolonged period and siltation can pollute surface waters and harm aquatic creatures such as insects and fish.

Dry soil conditions and high winds can also cause siltation. When small particle soils such as silts become dry, they have a powder-like texture and can easily be swept away by winds. Nonstructural measures help prevent wind erosion because they hold moisture next to the soil, keep the soil from drying out due to wind exposure, and prevent winds from carrying away dry soil particles.

9.3 Placement of Nonstructural Measures

Nonstructural measures will be used whenever there is a possibility that exposed soils on a construction site could wash into adjacent sensitive water resources, and where a barrier will not protect exposed soil from rain and runoff. Temporary nonstructural measures such as hay or straw mulch will be spread on all exposed soils within 100 feet of water resources within 48 hours of initial soil disturbance, or before any predicted storm event. Mulch will also be applied immediately to areas that have been seeded. All mulch materials will receive periodic inspection by the contractor (especially after rainstorms) to be sure that they are covering the soil they are meant to protect and are functioning properly. Mulches that are removed by excessive flow or wind will be replaced or reinstalled.

9.3.1 Temporary Measures

Temporary, nonstructural erosion control measures are summarized in Table 7 and include the following:

- Hay or straw mulch (unanchored on slopes less than eight percent, anchored on slopes greater than eight percent) on exposed soil areas and soil stockpiles in the construction area. Appendix C, Figure 24 illustrates proper mulch anchoring using netting.
- Between April 16 and October 31, temporary seeding covered by hay or straw mulch on soil stockpiles or areas of exposed soil within 100 feet of sensitive resources that are not scheduled for final restoration for 30 days. Temporary seeding is not required during the winter construction season; however, daily mulching is required on all exposed soils, including those exposed during winter, followed by temporary or permanent seeding, as appropriate, as soon as growing conditions allow. (See Section 9.0 for details of winter construction.)
- Erosion control mix (as described in Section 7.4) can be used as slope reinforcement or mulch on slopes that are 4:1 or less, on frozen ground or forested areas, and at the edge of gravel parking areas and active construction areas. Erosion control mix will be applied 2 inches thick plus an additional 1/2 inch per 20 feet of slope up to 100 feet (e.g., 3 inches thick for 60 feet of slope; 4 inches thick for 100 feet of slope). For slopes between 3:1 and 2:1, erosion control mix will be applied 4 inches thick

plus an additional 1/2 inch per 20 feet of slope up to 100 feet (e.g., 5 inches thick for 60 feet of slope; 6 inches thick for 100 feet of slope).

- Erosion control mix must be spread evenly and must provide 100 percent soil coverage.
- Erosion control mix will not support grass, but will support clover and other legumes and woody vegetation. Vegetation can be promoted by seeding, or it can be left to occur naturally.
- Curlex or jute matting (also known as erosion control blankets) can be used on areas of high wind exposure, slopes steeper than eight percent grade, unstable soils, and stream/river bank restoration areas. Matting is typically anchored with large staples, as recommended by the manufacturer (Appendix C, Figure 25). Although this type of material is usually used during final restoration, it is considered a temporary measure because it generally deteriorates within two years.
- Brush-slash-tops include woody pieces removed from trees that are otherwise unusable. These items can be placed on skidder trails as the machines cut and remove timber. This debris reduces the opportunity for skidder tires to sink into soft soil when they are spread out along the skidder trail.

Mulch on slopes less than 8%	Within 100 feet of wetlands or waterbodies apply hay and/or straw mulch at a minimum of 70 lbs./1,000 square feet of exposed soil (about 2 bales). Must be done within 48 hours of initial soil disturbance and before storm forecasted events, unless specified otherwise.
Mulch on slopes greater than 8%	Hay or straw mulch can be applied without being anchored, unless specific site conditions may require use of anchoring.
Temporary seeding in uplands	Within 100 feet of wetlands or waterbodies, apply annual ryegrass at 1 lb./1,000 square feet. Mulch with hay or straw. Must be done if final restoration is not scheduled within 30 days.
Temporary seeding in wetlands	If required, apply annual ryegrass at a rate of 1 lb./1,000 square feet and cover with only straw mulch. Do not add lime or fertilizer to wetlands. When in doubt, ask the TransCanada representative.
Temporary seedbed preparation	Apply limestone and fertilizer (uplands only) according to soil test data. If soil test is not possible, 10-10-10 fertilizer may be applied at a rate of 600 lbs./acre and limestone at 3 tons/acre.

TABLE 7. TEMPORARY NONSTRUCTURAL EROSION CONTROL MEASURE SUMMARY

9.3.2 Permanent Measures

Permanent measures included the following:

- Permanent grass and/or legume seeding covered by hay or straw mulch on all areas that have been restored to final grade. This is required to establish permanent, perennial, vegetative cover on exposed soils. This seeding generally applies between April 16 and October 31. Permanent seeding is not required during the winter construction season, although dormant seeding may be performed (See Section 9.0).
- Seeding covered by anchored Curlex or jute matting in areas of high wind exposure, on slopes steeper than eight percent grade, unstable soils, and stream/river bank restoration areas. Generally the matting provides temporary protection while the vegetation becomes established.
- Proper soil preparation before any seed is placed on the ground, as necessary. Soil preparation may include addition of lime and fertilizer in areas that have not been tested, or in areas that have been tested and are found to be deficient in plant nutrients. Lime and fertilizer will only be used in designated upland areas and never within waterbody buffer zones.

Summary information regarding proper permanent seed mix, application rates, locations, and mulching requirements is provided in Section 10.0 and Table 9.

10.0 WINTER CONSTRUCTION CONSIDERATIONS

In general, construction in the turbine area will not take place during winter frozen ground conditions. Limited activities, such as survey, tree clearing, and collector line construction are the only activities likely to occur in the turbine construction area. Properly conducted winter construction, however, may provide a unique opportunity to complete work along the transmission line in and around sensitive resources with a minimum of environmental impact. For instance, construction of the Kibby Expansion Project 115 kV transmission line in wetlands is anticipated to be completed during frozen ground conditions as much as possible.

Construction activities that are conducted between November 1 and April 15 will follow the erosion and sediment control BMPs that were developed by the DEP for winter construction, as applicable (BMP A-3 in the DEP *Maine Erosion and Sedimentation Control BMPs*). More frequent, heavier application of temporary mulch, increased dormant seeding rates, the substitution or additional use of erosion control mix berms in erosion control barriers and other supplemental erosion controls will be used, as required.

However, it is important to note that following the winter construction BMPs may not be necessary at all times during winter construction, and in some situations their use may increase the potential for erosion and sedimentation. For example, if there is no snow on the ground or the ground is not frozen by November 1, or at any time during winter construction, silt fencing will be installed if it can be properly anchored. Similarly, if saturated or inundated wetlands are not frozen, all work will be performed from construction mats. Also, if the ground thaws and the snow is gone before April 15, resumption of the standard BMPs may be appropriate. Temporary bridges will still be used for all stream crossings, regardless of the season or frozen ground or stream conditions. All areas stabilized during the winter construction period will be inspected once snow cover is gone in the spring and remedial measures taken as needed.

Table 8 highlights some of the major differences between winter construction and typical construction season BMPs. The table presents differences for temporary erosion control and stabilization measures that will be used during construction, and permanent measures when construction is completed.

Control Measure			
	April 16 through October 31	November 1 through April 15	
Mulch on slopes less than 8%	Within 100 feet of wetlands or waterbodies apply hay and/or straw mulch at a minimum of 70 lbs/1,000 square feet of exposed soil (about 2 bales). Must be done within 7 days of initial soil disturbance and before storm forecasted events.	Within 100 feet of wetlands or waterbodies apply and maintain properly anchored hay and/or straw mulch at a minimum of 150 lbs/1,000 square feet of exposed soil (about 5 bales) at all times (double the April 16 – October 31 rate). Or apply anchored erosion control mats or the appropriate layer of erosion control mix (Section 8.3.1). Do not apply mulch on top of more than 1 inch of snow. Remove snow as necessary. Apply anchored mulch after each day of final grading.	
Mulch on slopes greater than 8%	Hay or straw mulch can be applied without being anchored, though specific site conditions may require use of anchoring.	Apply mulch as specified above and anchor with Curlex, jute matting, or similar mulch netting. Erosion control mix can be used on slopes in place of anchored hay or straw mulch.	
Area of exposed soils allowed at any one time	No restriction on area exposed, but contractor must attempt to minimize amount of exposed soil at any one time, especially next to water resources.	Not more than 1 acre of exposed (not mulched or otherwise devoid of vegetative cover) soil.	
Sediment barriers	A single line of sediment barriers including silt fence or erosion control mix filter berms must be installed between water resources and disturbed soils.	If soil is frozen, use erosion control mix filter berms in place of silt fence sediment barriers. After Dec. 1, install 2 lines of sediment barriers if wetlands or waterbodies are within 100 feet of disturbed soils.	
Temporary seeding in uplands	If required, apply annual ryegrass at 1 lb/1,000 square feet. Mulch with hay or straw.	Not required, but if temporary seeding is desired, it must be applied at a rate 2 times higher than the General Construction Season, and covered with mulch.	
Temporary seeding in wetlands	If required, apply annual ryegrass at a rate of 1 lb/1,000 square feet and cover with straw mulch. Do not add lime or fertilizer to wetlands. When in doubt, ask the TransCanada representative.	Not required, but if temporary seeding is desired, it can be applied at a rate 3 times higher than the General Construction Season, and covered with straw mulch. Apply only annual rye grass and do not add lime or fertilizer.	
Permanent seeding in uplands	Apply seed mixture and mulch as specified in Table 8.	Not required before April 16, but if dormant seeding is desired, the site will receive an adequate cover of loam, if necessary, be seeded at a rate 2 times higher than the General Construction Season, and covered with mulch at a minimum of 150 lbs/1,000 square feet.	

Control General Construction Measure		Winter Construction	
	April 16 through October 31	November 1 through April 15	
Permanent seeding in wetlands	If required, apply annual ryegrass at a rate of 1 lb/1,000 square feet and mulch with straw. Do not add lime or fertilizer to wetlands.	Not required, but if temporary seeding is desired it can be applied at a rate 2 times higher than the General Construction Season, and covered with straw mulch. Do not add lime or fertilizer.	
Temporary seedbed preparation	soil test data. If soil test is not possible, 10-10-10 fertilizer General Construction requirements.		
Permanent seedbed preparation	Apply limestone and fertilizer (uplands only) according to soil test data. If soil test is not possible, 10-20-20 fertilizer may be applied at a rate of 800 lbs/acre and limestone at 3 tons/acre.	Not required before April 16, but if dormant seeding is desired, the seedbed can be prepared according to the General Construction requirements.	
Inspection and monitoring Erosion controls will be inspected weekly and after a ½ inch or greater rain storm to ensure proper function. Monitoring will be performed until a new, healthy vegetative cover is attained over at least 90% of the site. This applies to both temporary and permanent seeding.		Monitoring will be performed weekly during all periods when significant runoff could occur to ensure proper stabilization and re-vegetation (both temporary and permanent). Starting in the spring following completion of the project, inspections will be performed. Areas with less than 75% vegetated cover will be reseeded and mulched and monitoring continued until a new, healthy vegetative cover is attained over at least 90% of the site.	
Maintenance of erosion controls	If any evidence of erosion or sedimentation is evident, repairs will be made to existing controls or other methods will be used.	If any evidence of erosion or sedimentation is evident, repairs will be made to existing controls or other methods will be used.	

11.0 SITE RESTORATION STANDARDS

Following completion of the construction work, the contractor will be responsible for conducting site restoration work. The following guidelines will apply to all activities, including temporary and permanent roads, stream/wetland crossings, staging and work areas.

11.1 General Procedures

Near the completion of construction, TransCanada or its designated representative and the contractor will review the project restoration needs and prioritize the restoration work to be completed. This prioritization will consider time of year, ground conditions, re-vegetation probabilities, and equipment availability. A restoration "walk-through" will be conducted with the contractor and TransCanada's representative.

Highest priority restoration areas include, but are not limited to:

- All wetland, stream, or brook crossings, particularly the disturbed areas within 100 feet and stream banks;
- Drainage ways or ditches;
- Cut/fill banks and steep slopes (over eight percent);
- Around the substation construction area;
- Around pole and anchor pole placement; and
- All temporary access roads, ROW travel corridors, yarding, and construction laydown areas.

11.2 Methods of Restoration

All soil that is excavated, mounded, or deposited during construction will be regraded. All regrading and redistribution of soil will be completed to approximate existing grades. The banks of streams and rivers will be restored to natural conditions as much as practicable. In general, logs, timbers, construction mats or other material or any structure used at temporary crossings will be removed, and the banks restored to their original depth and contour. Any bridge materials or support culverts within the channel will be removed.

All construction mats used to cross or work in wetlands will be removed and any surface damage repaired, as needed. Exposed wetland soils will be stabilized by seeding with annual rye. Any construction mats, corduroy logs or bridges used to protect water resources on construction access roads will be removed and the road surface re-graded to original conditions, as needed.

Previously installed water bars may remain or new ones will be installed at locations designated by a TransCanada representative. Permanent water bars will be constructed to a sufficient height and width to divert the amount of water anticipated at each location as well as to provide some post-project permanence to the site. Water bars will be permanently seeded to ensure their long-term stability.

All areas severely rutted by construction equipment will be regraded and permanently revegetated. Upon completion of the project, all areas of exposed soil will be permanently revegetated or otherwise permanently stabilized. Lime, fertilizer, seed and hay or straw mulch will be applied in upland areas as specified in Table 9.

Type of Area	Soil Amendments	Seed Mix Components/(varieties)	Seed Rate (Ibs/acre ¹)	Mulch (tons/acre)
Uplands ^{2,3}	Apply ground limestone at 3 tons/acre	Creeping red fescue/(Pennlawn, Ensyla, Wintergreen)	20	1.5-2 (90 -100 bales)
	Apply 10-20-20 fertilizer at 800 lbs/acre	Redtop/(any native species)	2	
		Tall fescue/(Kentucky 31)	20	
Wetlands	None	Annual ryegrass/(any native species)	40	1.5-2 ⁴ (90 -100 bales)
 Increase seeding rates by 10% when hydroseeding. Add winter rye to the mix at a rate of 120 lb/acre after October 1. Do not lime or fertilize any areas within the waterbody buffers. Mulch wetlands with weed-free straw only. 				

TABLE 9. PERMANENT SEEDING SPECIFICATIONS

The contractor will be responsible for the proper maintenance of all revegetated areas until the project has been completed and accepted by TransCanada. Where seeded areas have become eroded or damaged by construction operations, or where poor germination is observed, the affected areas will be promptly re-graded, limed, fertilized, and re-seeded as needed. Areas that are revegetated following construction activities will be considered properly stabilized when healthy vegetation covers at least 90 percent of the seeded area unless adjacent, undisturbed areas indicate that achieving that level of vegetation in the area is unlikely.

The contractor will perform all erosion control work to the complete satisfaction of TransCanada before the work is accepted. TransCanada will base acceptance of the erosion control and stabilization work on a final inspection.

11.3 Timing of Restoration

Final restoration of areas disturbed by construction will be completed within the following time periods:

- At permanent river, stream or brook crossings, complete final restoration (finish grade, seed and mulch) of all areas within 100 feet of the waterbody within 48 hours of the final grading, unless specified otherwise.
- At temporary river, stream or brook crossings, complete final restoration (finish grade, seed and mulch) of all areas within 100 feet of the waterbody within 48 hours of the removal of the crossing, unless specified otherwise.
- Complete final restoration of all other areas within 100 feet of the waterbody or wetland within 48 hours of final grading.
- Complete final restoration of all other areas within 7 days of final grading.

12.0 SUPERVISION AND INSPECTION

To effectively mitigate project-related impacts, the Kibby Expansion Project E&S Plan must be properly implemented. Field decisions may be required regarding timing of construction activities and erosion and sedimentation control measures, proper placement and installation of erosion controls, restoration and revegetation and other construction-related items. Construction will be continually monitored and inspected in the field for compliance with the E&S Plan, as well as other environmental permit requirements and regulations, through the combined efforts of the contractors and TransCanada representatives. A description of the responsibilities of each of these groups for supervising and inspecting construction activity and sites for compliance with the E&S Plan is provided below.

12.1 Contractor Representative

All contractors working on construction of the Kibby Expansion Project will be required to designate an individual that is present on the ROW on a daily basis as the contractor's representative. The contractor representative will be responsible for monitoring the activities of its employees for compliance with the E&S Plan and other environmental permit requirements. The contractor representative will work closely with its personnel and TransCanada to ensure compliance. The contractor representative will be responsible for completing the Contractor's Weekly Inspection Form of Erosion and Sedimentation Control Measures, included in Appendix D.

12.2 TransCanada Representative

To ensure proper implementation of the erosion control plan, TransCanada employees or representatives will be assigned as environmental inspectors and be on the project site during active construction. The environmental inspectors will supervise the environmental aspects of construction activities and will report directly to the TransCanada construction field supervisor(s). TransCanada environmental inspectors will have the authority to stop activities that violate the environmental conditions of the E&S Plan or other permit requirements and order corrective action. The environmental inspectors will have an understanding of the wetland and waterbody resources required to be protected.

Responsibilities of the TransCanada environmental inspectors include working with the contractor to ensure project compliance with all environmental requirements permits and approvals, and the contractor has performed erosion control work that meets the applicable standards. Specific duties include: participation in the pre-construction and post-construction walk-throughs; verifying and marking the location of sensitive resource areas; verifying that all authorized construction work areas are marked before clearing; verifying the proper installation and maintenance of erosion control devices; verifying the repair of all ineffective temporary erosion control measures within 24 hours of identification; determining corrective action and implementation of additional measures deemed necessary based on field or weather conditions; working with the contractors and TransCanada to ensure compliance with environmental permit conditions and the spill prevention and control plan; documentation of temporary and permanent revegetation programs; verifying restoration of contours and topsoil; and coordination with environmental regulatory agencies.

The TransCanada environmental inspectors will participate in the pre-construction walkthrough of the ROW, followed by a meeting with the construction field supervisor(s) and the contractors to determine the sequence of construction and the placement of erosion control measures to be employed. The environmental inspectors will also participate in periodic coordination meetings with the construction field supervisor(s) and contractor personnel during construction. In addition, the environmental inspectors will perform independent inspection of erosion control devices to ensure proper functioning in areas of active construction. Furthermore, field inspections and documentation of erosion controls will be conducted on a weekly basis in areas with no construction, and following major storm events. The environmental inspector will keep records of compliance with the environmental conditions and mitigation measures required by federal and state environmental permits during active construction and restoration.

13.0 ENVIRONMENTAL TRAINING FOR CONTRACTORS

Environmental training will be provided by TransCanada to both TransCanada and contractor personnel whose activities or responsibilities could impact the environment during project construction. The level of training will be commensurate with the type of duties of the personnel. All personnel who will be working at a construction site at any time during construction, will be provided environmental training relating to erosion and sedimentation control before being allowed access to a construction site. The training will be given prior to the start of construction with refresher training provided on a monthly basis throughout the construction process to reinforce the importance of compliance with environmental requirements, and identify potential changes in erosion and sedimentation control or other requirements that have occurred during construction.

The training program will cover LURC standards, DEP standards, the Maine Erosion and Sedimentation Control Law, this E&S Plan, Maine Pollutant Discharge Elimination System (MPDES) Construction General Permit requirements for storm water management, the Spill Prevention Control and Countermeasure Plan, threatened and endangered species restrictions, job-specific permit conditions, TransCanada company policies, and any other pertinent information related to the job. In addition to the environmental compliance officer and other inspectors, the construction field supervisor(s) and all construction personnel are expected to play an important role in maintaining strict compliance with all permit conditions to protect the environment during construction. A record will be kept of the date, location, attendees and topics covered at all training sessions.

APPENDIX A DEFINITION OF TERMS

APPENDIX A DEFINITION OF TERMS

Adjacent to a natural resource: Within 100 feet or in a position to wash into a water resource (river, stream, brook, pond, wetland, or tidal area).

Annual seed mix: Seed mixture largely made up of plants that only persist one growing season.

Brook: Essentially the same as a stream, a water course that has a defined channel, a gravel, sand, rock or clay base, and flows at least part of the year. It may be a dry channel part of the year.

Corduroy: Logs greater than 3 inches in diameter at the small end and at least 18 feet long that are placed perpendicular to travel direction, on approaches to and in wetlands for crossings. The purpose of the logs is to prevent rutting and preserve vegetation root integrity in and adjacent to wetland areas. May also be used on approaches to mats or bridge stream crossings.

Crossing: Any activity extending from one side to the opposite side of a sensitive natural resource whether under, through, or over that resource. Such activities include, but are not limited to, roads, fords, bridges, culverts, utility lines, water lines, sewer lines, and cables, as well as maintenance work on these crossings. Crossings should be done to minimize impact. For example, crossing at a right angle to the resource and finding the driest or narrowest spot is one method for minimizing impact.

Cross-sectional area: The cross-sectional area of a stream channel is determined by multiplying the stream channel width by the average stream channel depth. The stream channel width is the straight-line distance from the normal high water line on one side of the channel to the normal high water line on the opposite side of the channel. The average stream channel depth is the average of the vertical distances from a straight line between the normal high water marks of the stream channel to the bottom of the channel.

Culvert: A pipe or box structure of wood, metal, plastic, or concrete used to convey water. **Erosion**: Movement of earthen material by water or wind.

Erosion control blanket (matting): Manufactured material made out of natural or synthetic fiber designed to control movement of earthen material when installed properly.

Erosion control mix: Erosion control mix consists primarily of organic materials such as shredded bark, wood chips, stump grindings, composted bark, or similar materials. Ground construction debris or reprocessed wood products are not acceptable for use in erosion control mix. It contains a well-graded mix of particle sizes and may contain rocks up to 4 inches in diameter. Properly manufactured mix will have organic matter content between 80 and 100 percent (dry weight), 100 percent of particles must pass a 6-inch screen, the organic portion needs to be fibrous and elongated, only small proportions of silts, clays, or fine sand, and a pH between 5.0 and 8.0. Its applications include erosion control berms and mulch.

Erosion control plans: Written guidelines specific to a project or activity, describing various techniques and methods to control erosion for specific construction activities.

Fill: Any earth, rock, gravel, sand, silt, clay, peat, or debris that is put into or upon, supplied to, or allowed to enter a water body or wetland. Material, other than structures, placed in or adjacent to a water body or wetland.

Filter strip: Undisturbed areas of ground consisting of natural vegetation and natural litter such as leaves, brush, and branches, located between a water resource and access road, skid road or trail, or other area of disturbed soil.

Ford: A permanent crossing of a stream utilizing an area of existing, non-erodible substrate of the stream, such as ledge or cobble, or by placing non-erodible material such as stone or geotextile on the stream bottom.

Geotextile, Non-woven: Synthetic material made of spun polypropylene fiber used to support wetland fill or stabilize soils.

Geotextile, Woven: Synthetic material of woven polypropylene used to stabilize soils and make sediment barriers (silt fence).

Great pond: An inland water body which in a natural state has a surface area in excess of 10 acres, and any inland water body which is artificially formed or increased which has a surface area in excess of 30 acres.

Intermittent watercourse: Water course that has water in it only part of the year. It is still considered a natural resource.

Mats: Pre-constructed, portable, timber platforms used to support equipment or travel in or over wetlands or water bodies.

Mulch: Temporary erosion control such as hay, bark, or some similar natural material utilized to stabilize disturbed soil.

Perennial seed mix: Seed mixture made up of seeds from plants that persist for several years.

Perennial watercourse: A river, stream, or brook depicted as a solid blue line on the most recent edition of a United States Geological Survey 7.5 minute series topographic map. Typically has water in it year round.

Permanent access road: Project access road that is not restored after project construction completion. Permanent access roads should be designed and constructed so they are not an erosion problem. They are associated with turbine access and none are currently anticipated to be constructed for the proposed 115 kV transmission line.

Permanent stabilization: Establishment of a permanent vegetative cover on exposed soils where perennial vegetation is needed for long-term protection.

Permanent vegetative cover: Perennial seed stock, including but not limited to grasses and legumes that persist for more than several growing seasons.

Protected Natural Resource: Coastal sand dune system, coastal wetlands, significant wildlife habitat, fragile mountain areas, freshwater wetlands, great ponds or rivers, streams, or brooks. This definition is taken from the Maine Natural Resources Protection Act dated August 23, 2006.

Riprap: Heavy, irregular-shaped rocks that are fit into place, usually without mortar, on a slope in order to stabilize and prevent soil erosion.

Sediment barrier: Staked hay bales, silt fence, or similar materials placed in a manner to intercept silt and sediment laden water runoff.

Sedimentation: Deposition of earthen material in a water body or wetland.

Sensitive Natural Resource: Area that deserves special attention because it is significant wildlife habitat, fisheries habitat, or has other natural resource values. These areas may require the use of minimum impact construction techniques such as use of mats, leaving vegetation intact for buffers, special timing of construction, or other specific techniques.

Settling basin (sediment/catch basin): Excavated pit placed to intercept water running off disturbed soils or dirt road bed. Usually used only where filter strip is inadequate to protect a stream, pond, or wetland from silt and sediment.

Silt fence: Woven geotextile sediment barrier. Proper installation requires placement oncontour and keying the fabric in at ground level.

Steep slopes: Slopes in excess of eight percent.

Stone check dam: A small, temporary dam constructed across a swale or drainage ditch. The purpose is to reduce the velocity of concentrated flows, reducing erosion and trapping sediment generated in the ditch. **Stream**: Generally, a channel between defined banks with a gravel, sand, rock, or clay base that flows at least part of the year. It may be a dry channel part of the year. The Maine Natural Resources Protection Act contains a more detailed definition.

Structure: Anything built for the support, shelter, or enclosure of persons, animals, goods, or property of any kind, together with anything constructed or erected with a fixed location on or in the ground. Examples of structures include buildings, utility lines, and roads.

Temporary access road: Road constructed solely for project access which is restored to original grade upon project completion, if not sooner. All exposed soils on access road adjacent to water bodies or on slopes steeper than eight percent must be stabilized with a permanent seed mix and mulch or matting.

Temporary stabilization: Mulch, matting, or seed, or a combination thereof, utilized to stabilize soil. Soil stock piles left in place longer than 14 days must have temporary stabilization.

Temporary vegetative cover: An annual seed mixture, typically annual rye and oats. **Topography**: The contour and elevation of the surface of the ground.

Turn out: Water diversion that directs water out of a ditch or off a travel-way and into a vegetated buffer.

Upland edge: The area of uplands alongside a wetland, stream, or water body.

Wastes requiring special handling: Wastes generated from construction activity including engine oil, hydraulic oil, gear oil, diesel, gasoline, or coolants.

Water bar: Constructed bar across an access road or skid trail that directs surface water off the road or trail into a stable vegetated surface or filter strip. They are used as a temporary measure on active roads or when closing roads permanently to prevent erosion.

Water body: River, stream, brook, pond, wetland, or tidal area.

Water resource: River, stream, brook, pond, wetland, or tidal area.

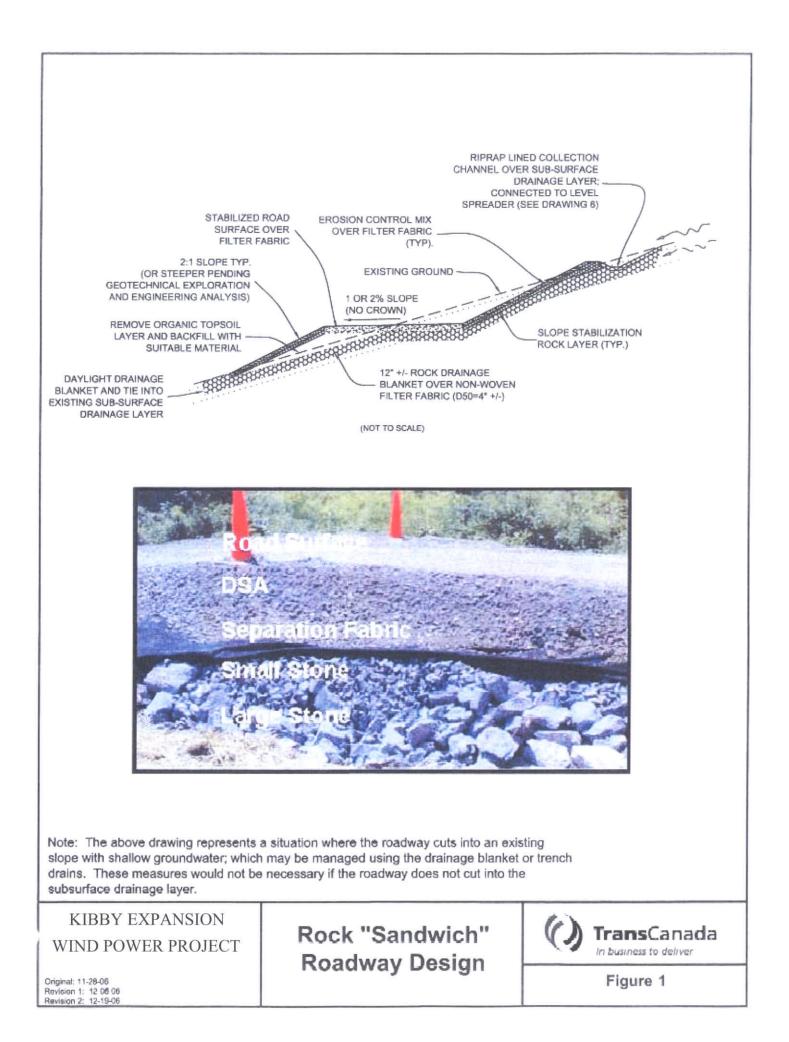
Wetland: An area that is inundated or saturated by surface or groundwater at a frequency and for a duration sufficient to support, and which under normal circumstance do support, a prevalence of wetland vegetation typically adapted for life in saturated soils. The Maine Natural Resources Protection Act contains a more detailed definition.

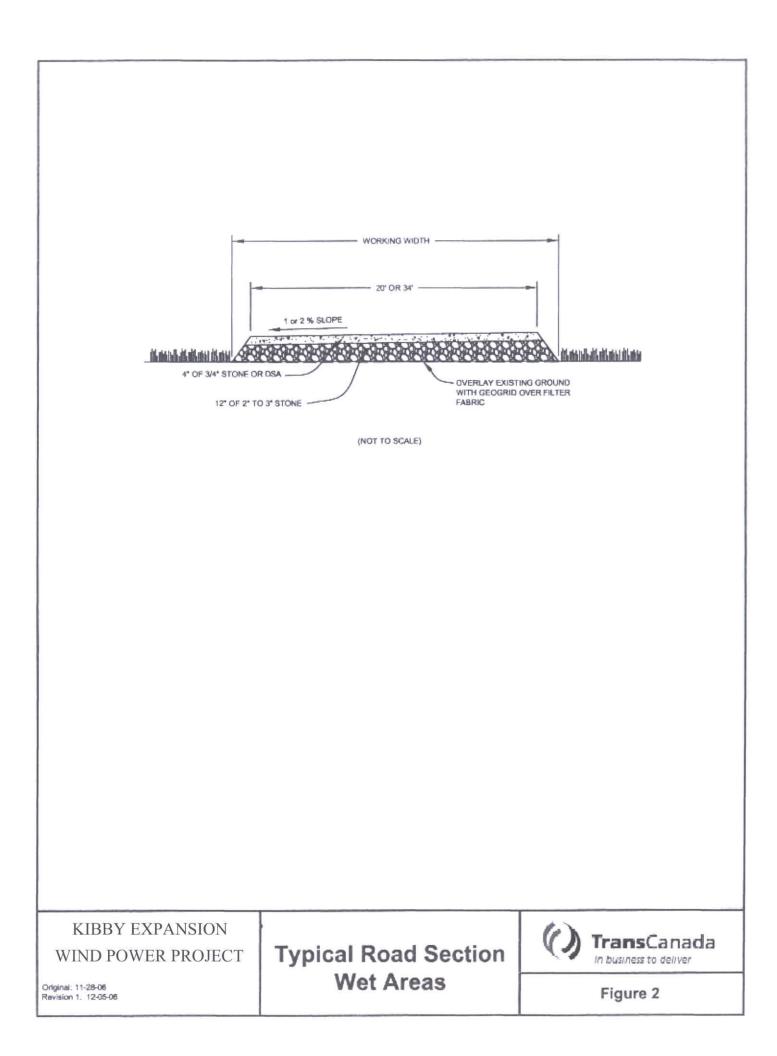
APPENDIX B PROJECT CONTACT LIST

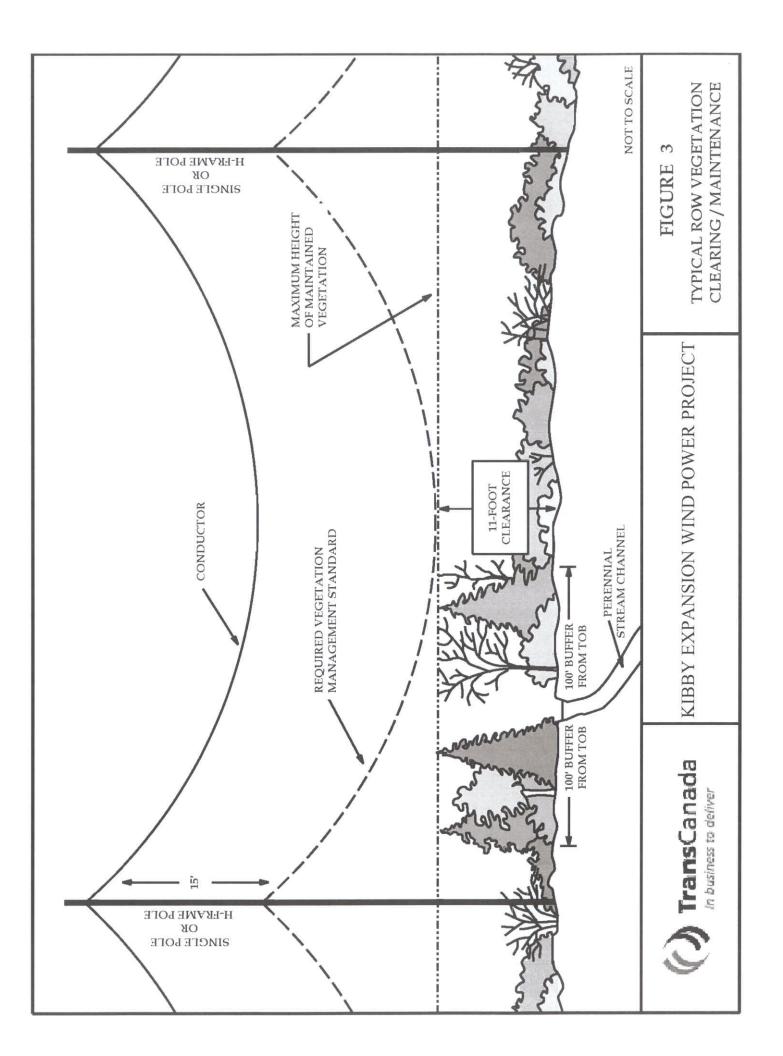
APPENDIX B PROJECT CONTACT LIST

To be determined	Office:
TransCanada	Mobile:
Construction Project Manager	
To be determined	Office:
Lead Environmental Inspector	Mobile:
To be determined	Office:
Environmental Compliance Manager	Mobile:
To be determined	Office:
Land Agent	Mobile:
To be determined	Office:
Public Relations	Mobile:
Marcia Spencer-Famous	Office: (207) 287-2631
LURC Contact	Mobile:

APPENDIX C CONSTRUCTION TECHNIQUE ILLUSTRATIONS (Refer also to Erosion and Sediment Control Drawings in the Final Development Plan Application, Appendix F – Design Drawings – Roads and Turbines)

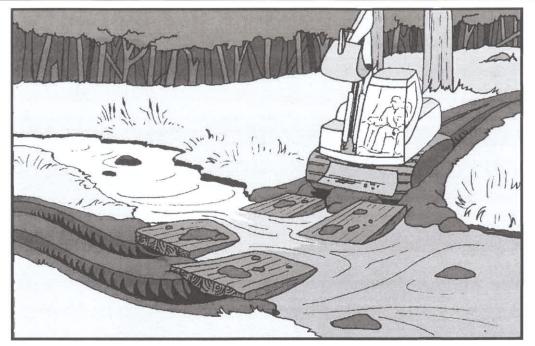






DIAMETER		
1b. load) (40,000 1b. load)		
3 in. 12 in		
B in. 14 in.		
0 in. 16 in.		
GEOTEXTILE FABRIC GEOTEXTILE FABRIC CONTRUCTED FROM 4" X 12" Y 12" PLANKS OR TIMBER MATS OR TIMBER MATS DECIDENTIALE FABRIC CONTRUCTED FROM 4" X 12" X 12" PLANKS DECIDENTIALE FABRIC DECIDENTIALE FABRIC CONTRUCTED FROM 4" X 12" X 12" PLANKS DECIDENTIALE FABRIC DECIDENTIALE FABRIC DECIDENTIALE FABRIC DECIDENTIALE FABRIC DECIDENTIALE FABRIC DECIDENTIALE FABRIC		
FIGURE 4 LOG / TIMBER MAT BRIDGE KIBBY EXPANSION		
WIND POWER PROJECT		
() TransCanada		
B 300		

TIMBER MAT - WATERBODY CROSSING



IMPROPER INSTALLATION

• Mats not long enough to keep equipment out of water and wetland soils Lacks cross supports which elevate travel mat Mats do not extend far enough to protect wetland soils from rutting

PROPER INSTALLATION • Mats are elevated by cross-supports on stream banks, keeping them up out of water and out of wet soils • Water flows under mats •Mats extend over approaches to crossing, protecting soils from eroding • Equipment stays out of water and wetlands

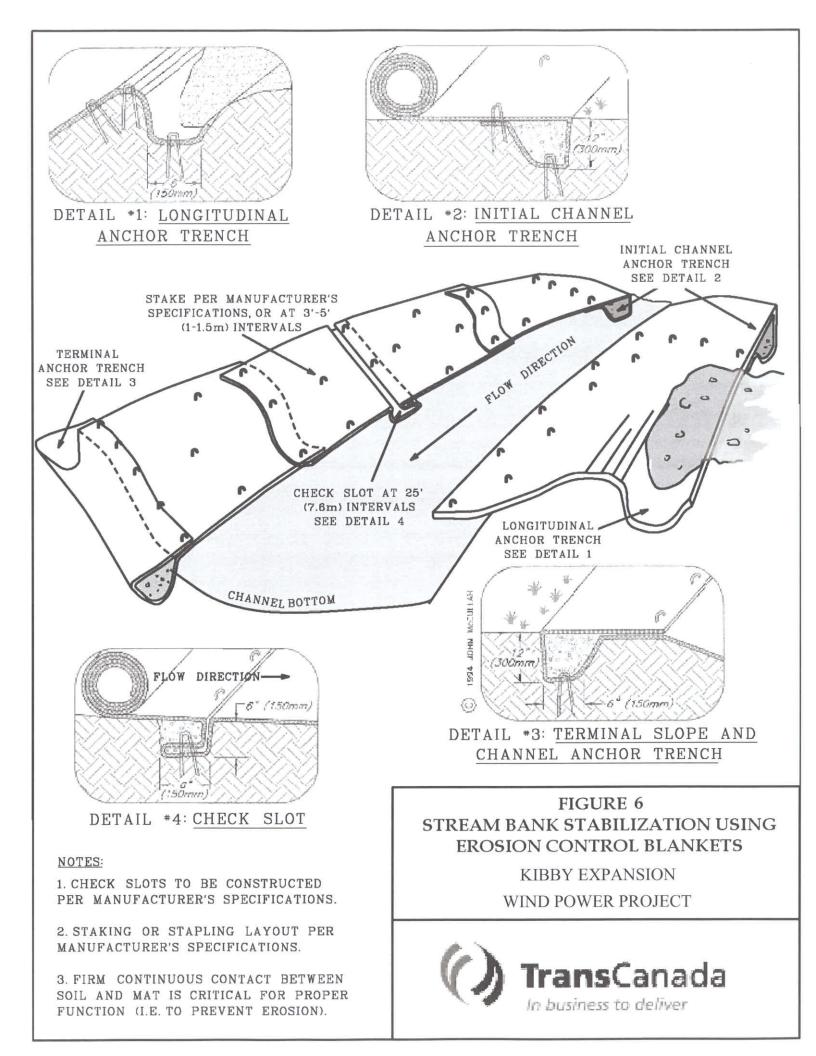


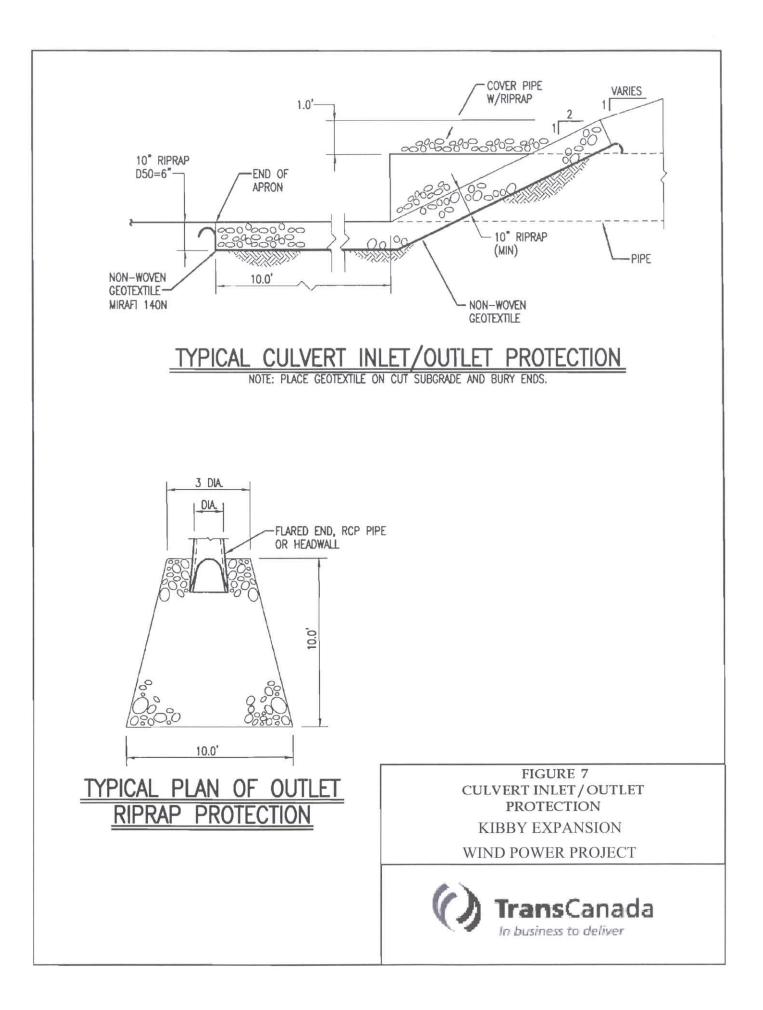
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KIBBY EXPANSION

WIND POWER PROJECT

FIGURE 5 TIMBER MAT WATERBODY CROSSING





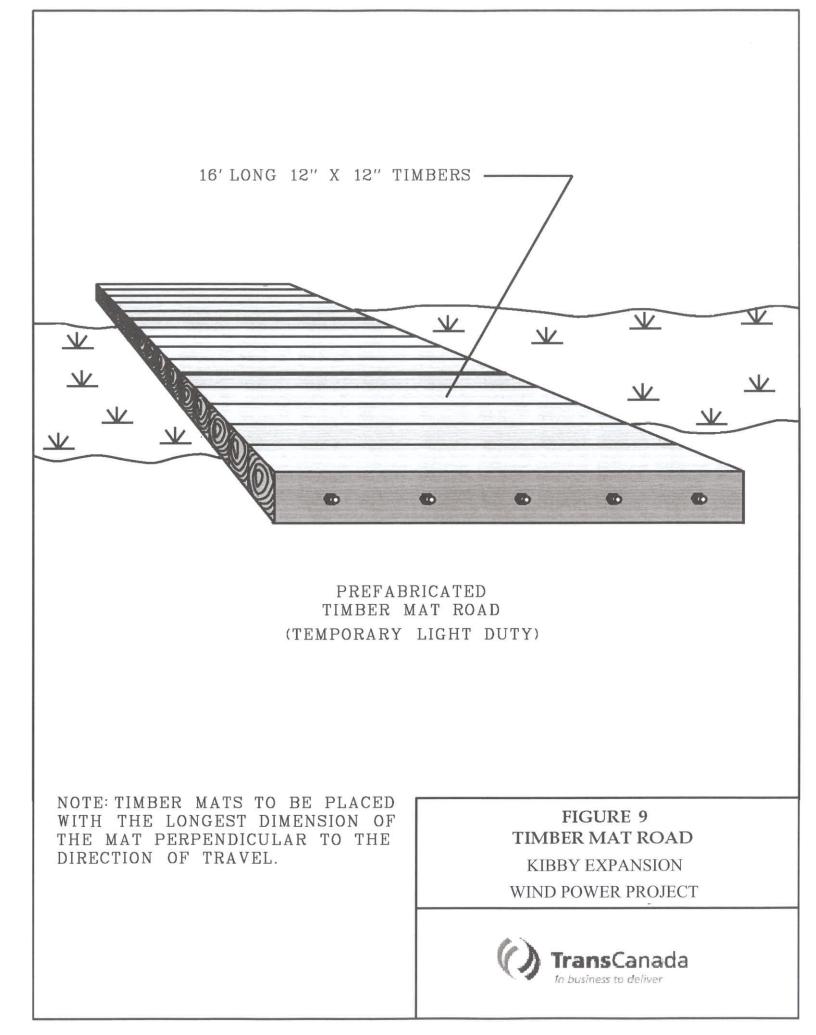
CULVERT CROSSING Em Tim Munary IMPROPER INSTALLATION • Culvert is undersized, allowing overflow to cross travel-way Insufficient cover thickness over culvert • Outlet is not stable, leading to erosion • Culvert outlet is set too high, causing it to be impassable to fish and other aquatic organisms The server whense PROPER INSTALLATION • Culvert is adequately sized for flow Sufficient cover thickness over culvert •Inlet and outlet are adequately supported by gravel and rock to protect and maintain stability •Outlet is properly seated at or below stream bottom, allowing aquatic organisms to travel upstream

() TransCanada

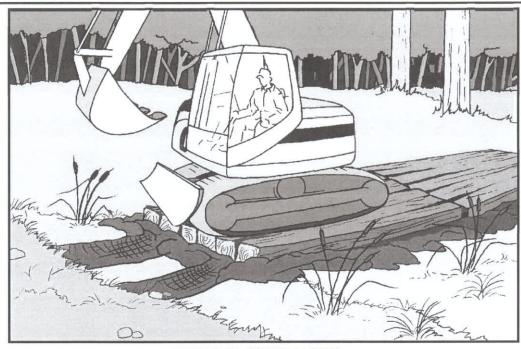
KIBBY EXPANSION

WIND POWER PROJECT

FIGURE 8 CULVERT CROSSING



TIMBER MAT - WETLAND CROSSING



IMPROPER INSTALLATION

Long axis of mats is not perpendicular to travel direction
Mats are working down into wetland causing significant disturbance and picking up mud
Mats do not extend beyond wetland edge to solid ground



PROPER INSTALLATION

Correct orientation relative to travel direction
Entire wetland is spanned, preventing rutting at ends of crossing



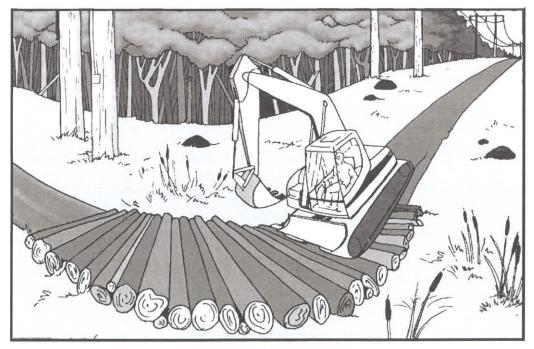
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KIBBY EXPANSION WIND POWER PROJECT FIGURE 10 TIMBER MAT WETLAND CROSSING

CORDUROY CROSSING



IMPROPER INSTALLATION • Area is too wet for proper application of corduroy • Insufficient corduroy to support equipment • Corduroy is sunken into wetland soil • Approaches are steep, rutted, and are not protected with additional corduroy or mats



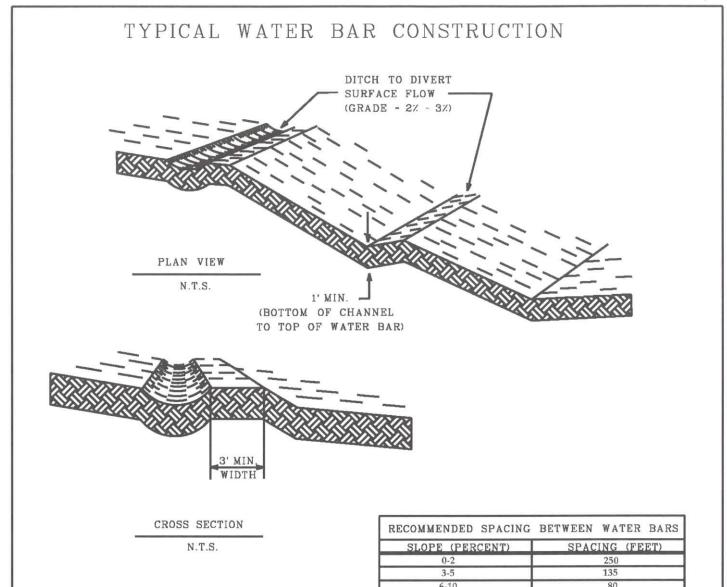
PROPER INSTALLATION No flowing or standing water or saturated soil present Adequate amount of layered corduroy to protect soil from rutting Approaches are protected from rutting by extension of corduroy beyond edges of crossing



KIBBY EXPANSION

WIND POWER PROJECT

FIGURE 11 CORDUROY CROSSING



NOTES:

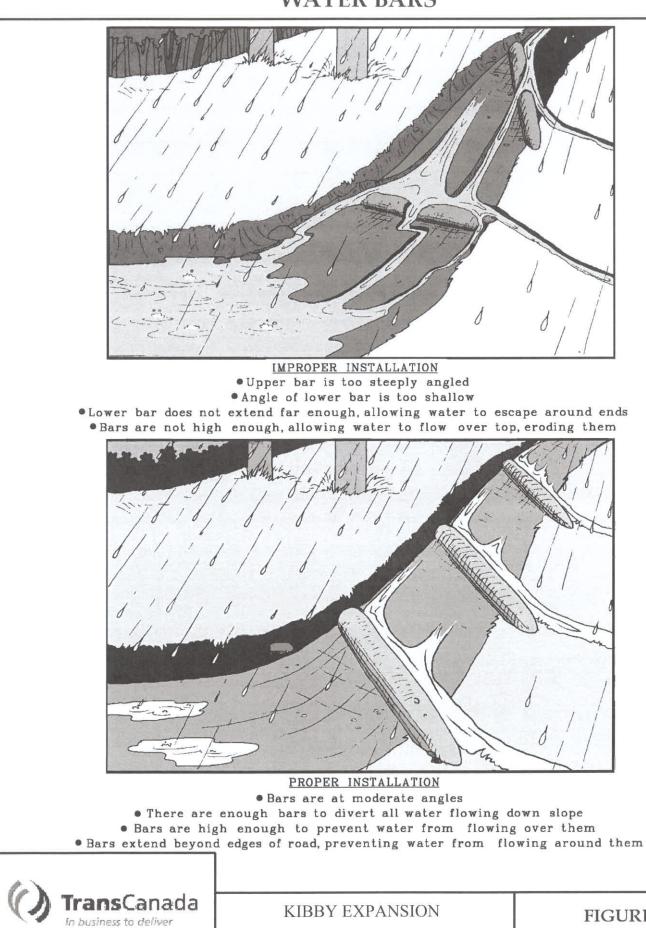
- 1. All trees, brush, stumps, rocks, and other obstructions shall be removed and disposed of to prevent interference with the proper functioning of the diversion.
- 2. Fills shall be compacted as needed to prevent unequal settlement or failure.
- 3. All graded areas shall be stabilized with temporary or permanent seeding.
- 4. Diversion channel should be lined with erosion control fabric as soil conditions require.
- 5. The outlet of the water bar must be to a well vegetated area or be stabilized by installing a stone check dam, haybale/silt fence dissipating device or synthetic geomat. depending on the amount of channelized flow expected. If used, the geomat will consist of a geotextile fabric 8 feet wide and 10 feet long. The end of the fabric at the right-of-way must be toed into the ground.

RECOMMENDED SPACING	BETWEEN WATER BARS
SLOPE (PERCENT)	SPACING (FEET)
0-2	250
3-5	135
6-10	80
11-15	60
16-20	45
21+	35

FIGURE 12 TYPICAL WATER BAR KIBBY EXPANSION WIND POWER PROJECT

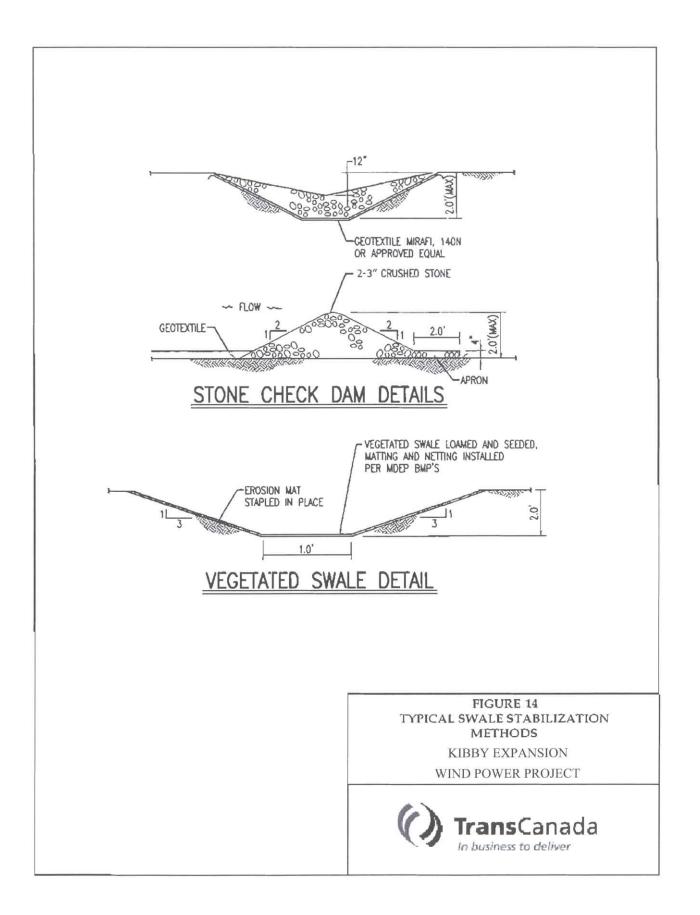


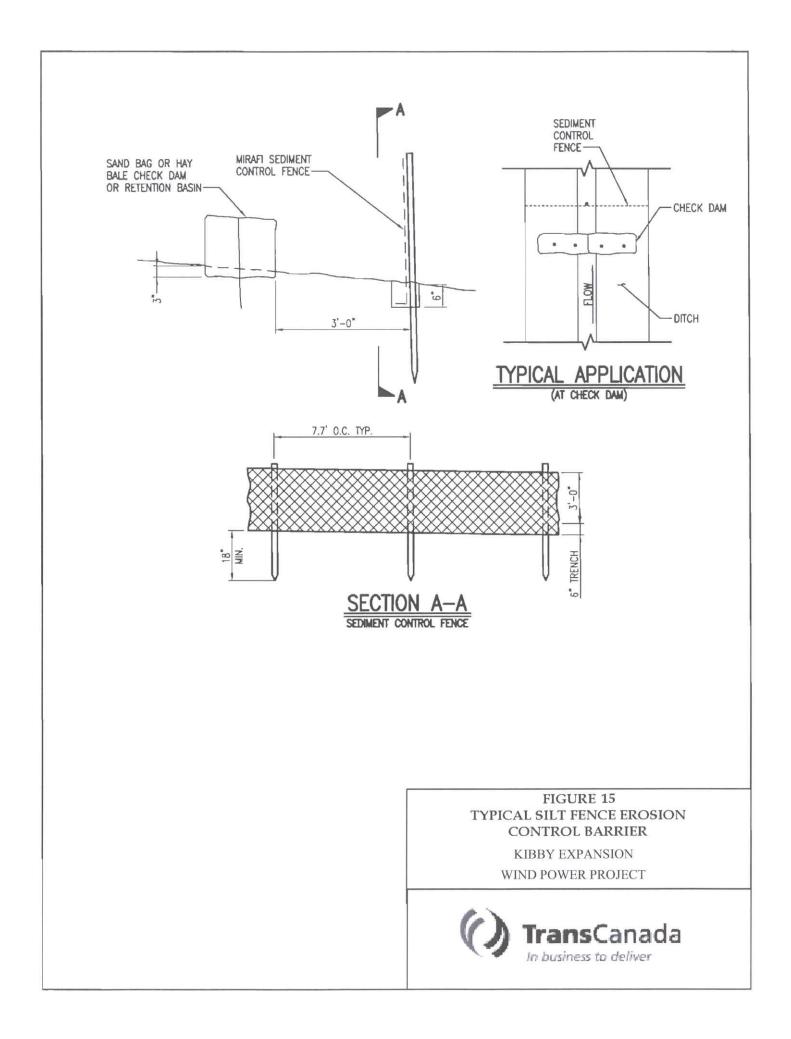
WATER BARS

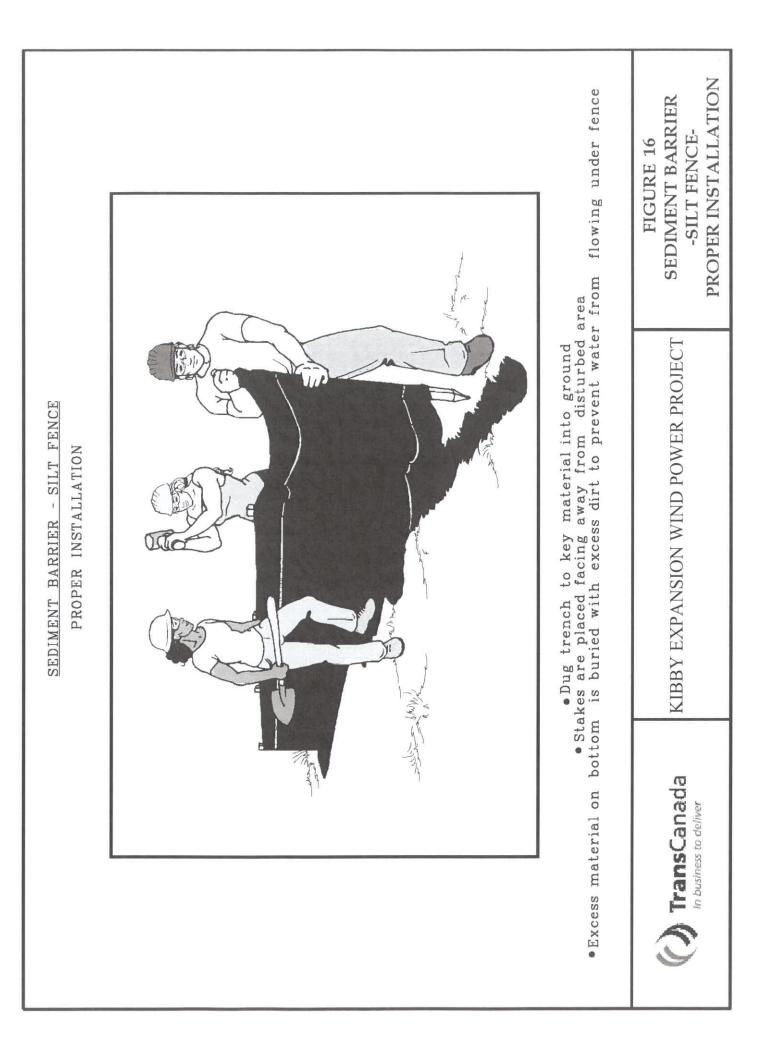


WIND POWER PROJECT

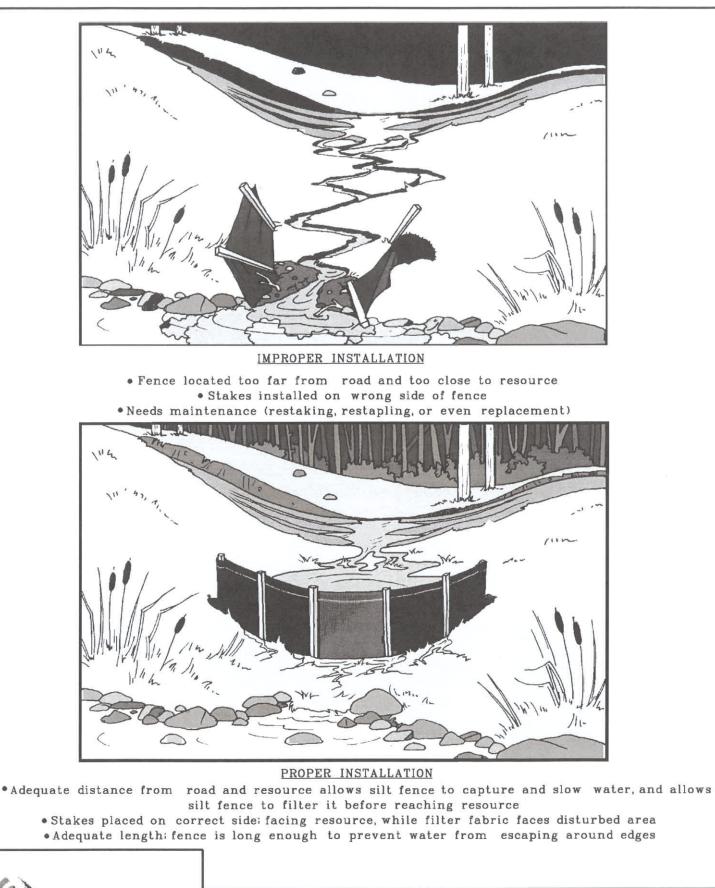
FIGURE 13 WATER BARS







SEDIMENT BARRIER - SILT FENCE

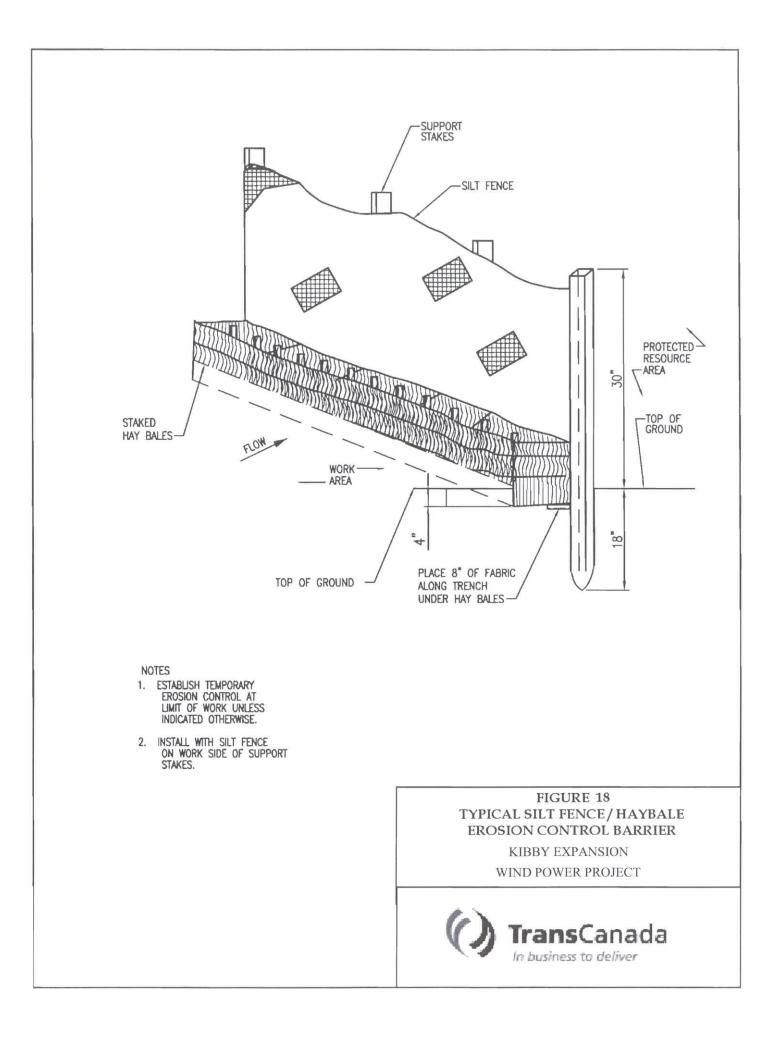


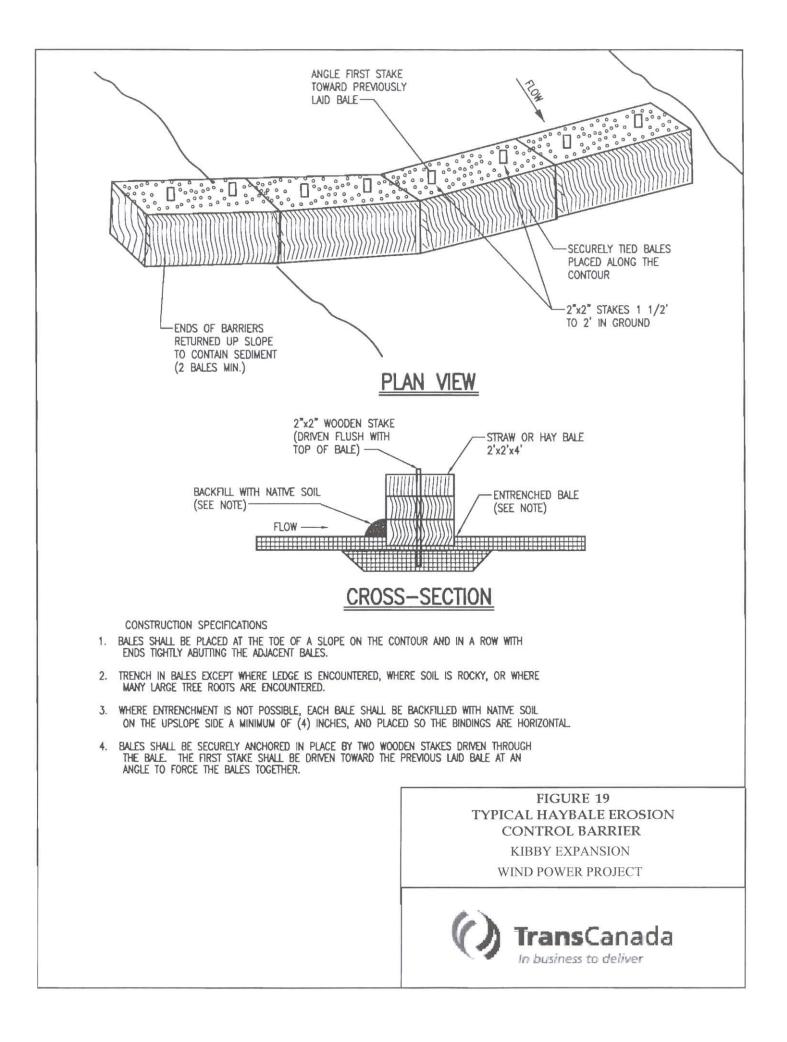
KIBBY EXPANSION WIND POWER PROJECT

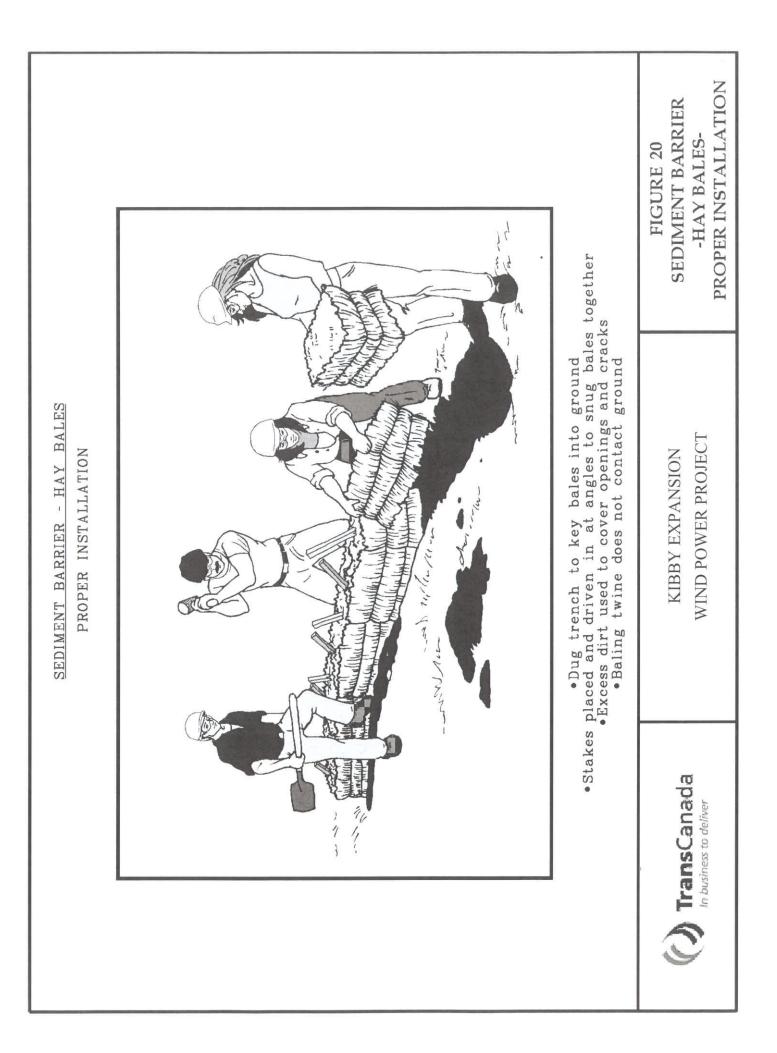
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FIGURE 17 SEDIMENT BARRIER SILT FENCE



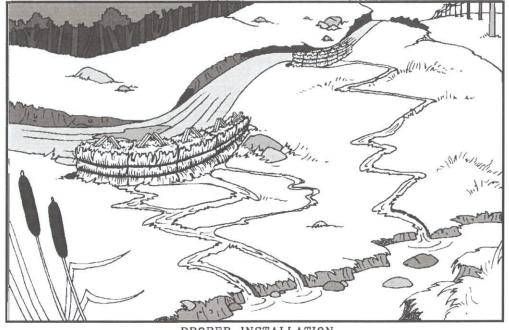




SEDIMENT BARRIER - HAY BALES



IMPROPER INSTALLATION • Hay bales are not staked • Not enough hay bales to adequately capture and slow flow • Too far from source of runoff and sediment • Improper orientation of bales: horizontal grass fibers do not provide adequate filtration • Baling twine in contact with ground



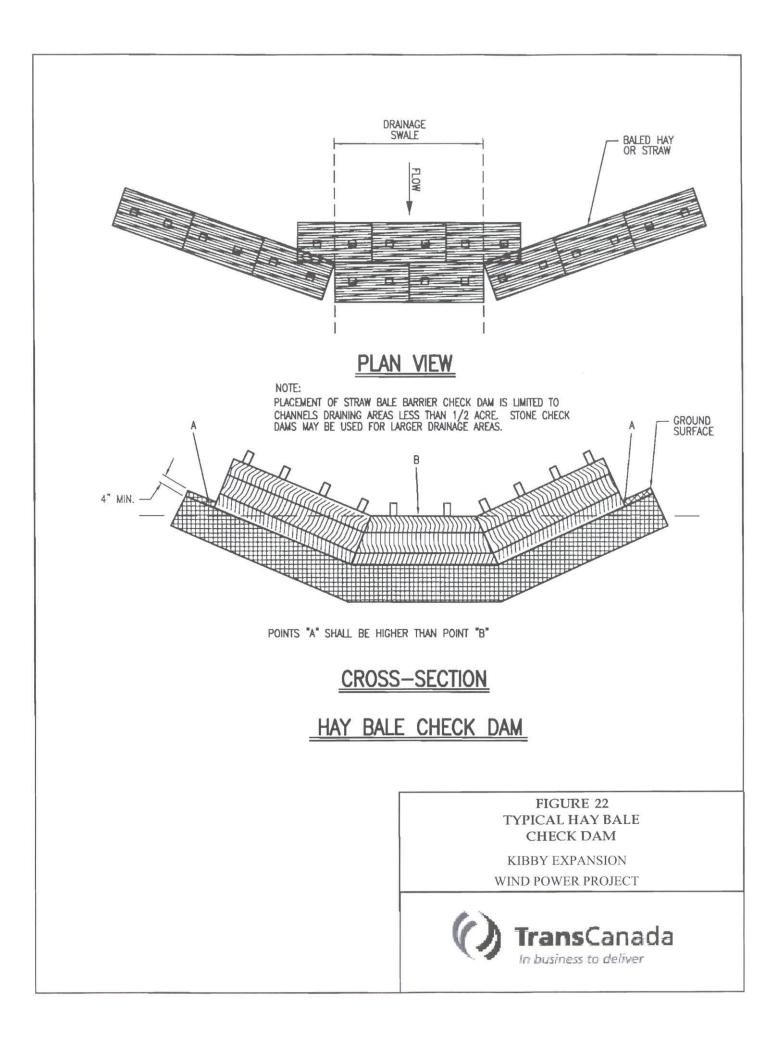
PROPER INSTALLATION

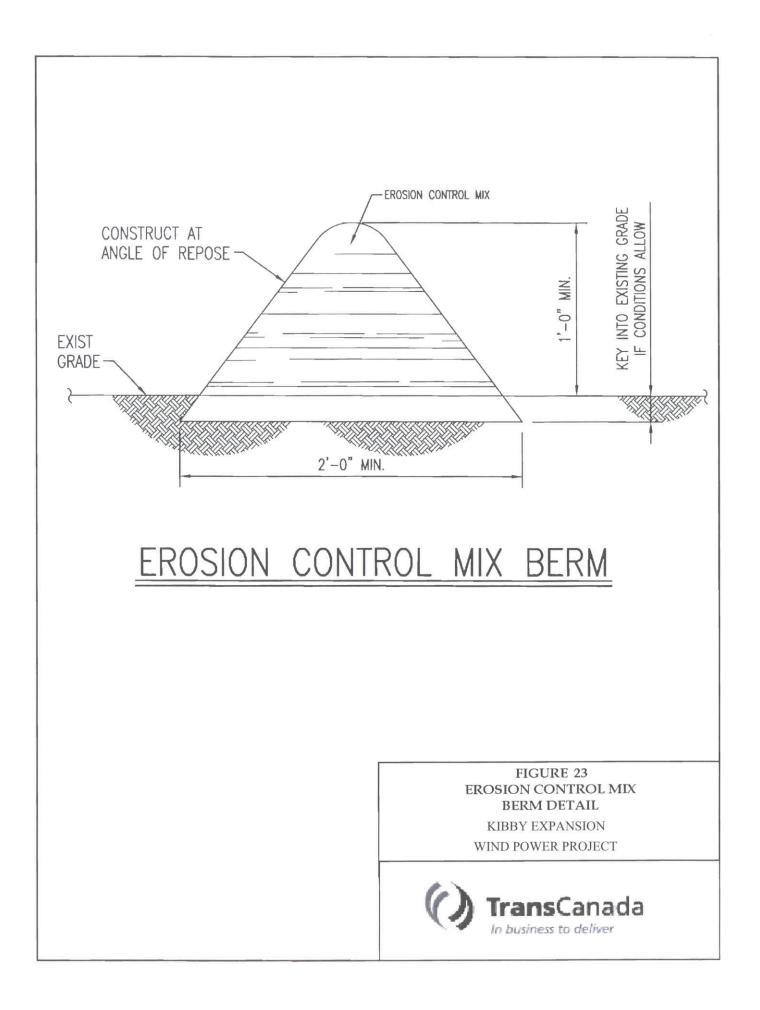
Staked properly; bales are secure and snug to one another
Sufficient number of bales to slow flow and insure that no water escapes around edges
Positioned close to disturbance, and far from resource to allow proper filtration
Vertical orientation of grass fibers provides adequate filtration

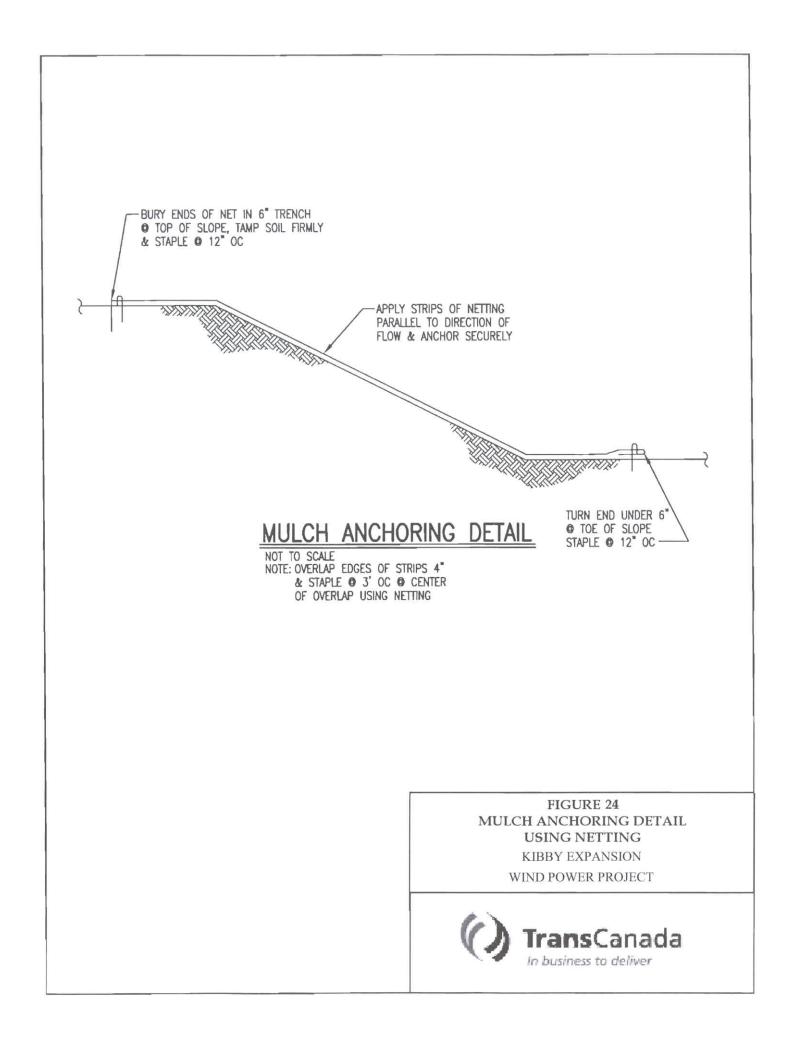
Baling twine does not contact ground

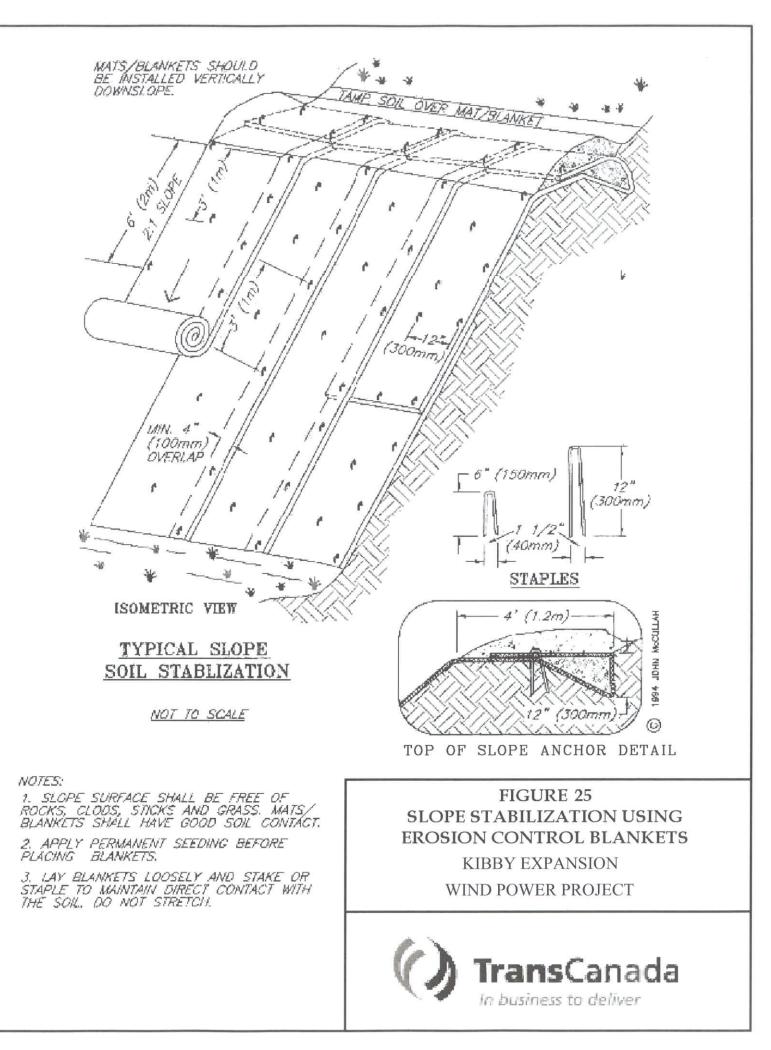


KIBBY EXPANSION WIND POWER PROJECT FIGURE 21 SEDIMENT BARRIER HAY BALES









APPENDIX D CONTRACTOR'S WEEKLY INSPECTION FORM

TRANSCANADA KIBBY PROJECT 115 kV TRANSMISSION LINE

TEMPORARY STREAM CROSSING AND

EROSION AND SEDIMENTATION CONTROL INSPECTION FORM

Date:

Inspector:

Location (mile post, structure number, access road):

Do adequate winter conditions exist (frozen ground and at least six inches of snow cover)?

Yes No Comments:

Have temporary stream crossings (bridges) been properly installed and are they intact?

Yes No Comments:

Are stream channels clear of debris such that the stream channel is not obstructed?

Yes No Comments:

Are Best Management Practices (BMPs) for erosion and sediment control being employed (such as silt fence, water bars, haybale check dams, seeding, hay mulch)?

Yes No

Circle all erosion and sediment control BMPs currently in use:

Silt Fence Water Bars Hay Bale Check Dams Seeding Mulching

Are BMPs being used properly (i.e., silt fence properly anchored and maintained, proper seeding and use of hay mulch)?

Yes No Comments:

Have temporary timber mats been used for wetland crossings?

Yes No Comments:

Is there any evidence of excessive rutting of soils, wetland crossing without use of temporary mats, soil erosion, or sedimentation of waters along any portion of the areas inspected?

Yes No Comments:

If yes, please explain who was notified and directed to take corrective action and the date and time they were notified:

Acknowledgement	TransCanada	Contractor
	Print:	Print:
	Signature:	Signature:

Kibby Expansion	Wind Power	Project
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Compl	letion	OT

Actions

Print:	Print:

Signature:_____ Signature:_____

APPENDIX E MAINE EROSION AND SEDIMENTATION CONTROL LAW 38 MRSA §420-C

APPENDIX E

MAINE EROSION AND SEDIMENTATION CONTROL LAW^{*} <u>38 MRSA §420-C</u>

A person who conducts, or causes to be conducted, an activity that involves filling, displacing or exposing soil or other earthen materials shall take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource as defined in section 480-B. Erosion control measures must be in place before the activity begins. Measures must remain in place and functional until the site is permanently stabilized. Adequate and timely temporary and permanent stabilization measures must be taken and the site must be maintained to prevent unreasonable erosion and sedimentation.

This section applies to a project or any portion of a project located within an organized area of this State. This section does not apply to agriculture fields. Forest management activities, including associated road construction or maintenance, conducted in accordance with applicable standards of the Maine Land Use Regulation Commission, are deemed to comply with this section. This section may not be construed to limit a municipality's authority under home rule to adopt ordinances containing stricter standards than those contained in this section.

[°] The Erosion and Sedimentation Control Law is administered by DEP. Please contact the DEP in Augusta, Maine with specific questions regarding this law.

APPENDIX F MAINE SLASH LAW 12 MRSA §9333

<u>APPENDIX F</u> <u>MAINE SLASH LAW^{*}</u> 12 MRSA §9333

§9333. Disposal along railroad and utility lines

1. **Stumpage owner**. A stumpage owner, operator, landowner or agent who cuts or causes or permits to be cut any forest growth on lands that are within or border the right-of-way of a railroad, a pipeline, or an electric power, telegraph, telephone or cable line may not place slash or allow it to remain on the ground within the right-of-way or within 25 feet of the nearer side of the right-of-way.

2. **Construction**. Slash accumulated by the construction and maintenance of a railroad, a highway, a pipeline or electric power, telegraph, telephone or cable line may not be left on the ground but must be hauled away, burned or chipped. Slash may not be left or place within the right-of-way or within 25 feet of the nearer side of the right-of-way. If a burning permit is denied or revoked under this chapter, the director may allow logs that are too large to be chipped to remain in the right-of-way until the director determines that their removal is economically feasible.

3. **Utility line maintenance**. Slash accumulated by the periodic maintenance of a pipeline or an electric power, telegraph, telephone or cable line may be disposed of in the following manner.

A. Slash with a diameter of 3 inches or less may be left in piles on the ground within the maintained portion of the right-of-way. A pile may not be higher than 18 inches from the ground or longer than 50 feet and must be separated from other piles by a minimum of 25 feet in every direction. A buffer strip with a minimum width of 10% of the total width of the maintained right-of-way must be kept totally free of slash with a diameter of 3 inches or less.
B. Slash with a diameter of more than 3 inches must be removed, chipped or limbed and placed on the ground surface. The pieces must be separated and may not be piled one piece over another. Slash of this size may be left within the maintained buffer strips.

C. If a utility line right-of-way is adjacent to a road, slash that is 3 inches or less in diameter must be removed, burned or chipped. Slash with a diameter of more than 3 inches may be left on the ground within the right-of-way and must not be limbed and separated and may not be piled one piece over another. Usable timber products generated from the maintenance of a utility right-of-way may be piled within the right-of-way but must be removed within 30 days.

* Note that this is an excerpt from the full text of the law. Please contact the Maine Forest Service, Augusta, Maine, for the full text of the law or with specific questions regarding the Slash Law.

APPENDIX G OTHER RECOMMENDED REFERENCES

APPENDIX G OTHER RECOMMENDED REFERENCES

<u>Maine Erosion and Sediment Control BMPS.</u> Bureau of Land and Water Quality, Maine Department of Environmental Protection, Augusta, Maine. March 2003. DEPLW0588.

<u>Best Management Practices for Forestry: Protecting Maine's Water Quality</u>. Maine Forest Service, Augusta, Maine. 2004. www.state.me.us/doc/mfs/pubs/bmp_manual.htm

Forest Transportation Systems: Roads and Structures Manual. Seven Islands Land Company, Bangor, Maine. Third Edition, 1999.

APPENDIX H CONSTRUCTION MATERIALS SOURCE LIST

APPENDIX H

CONSTRUCTION MATERIALS SOURCE LIST

The following list of vendors has been selected given the wide variety of construction materials they offer. The list is not meant to be all-inclusive or an indication of favored vendors.

W.H. Shurtleff Company (Culverts, Geotextiles)
One Runway Road
Suite 8
South Portland, Maine 04106-6169
1-800-663-6149
info@whshurtleff.com

A. H. Harris (Geotextiles, i.e. Curlex Excelsior Blankets)				
22 Leighton Road	585 Riverside Street			
Augusta, Maine 04332	Portland, Maine 04103			
(207) 622-0821	(207) 775-5764			
Attn: Daryl Harvey	Attn: Andy Morrison			

North American Green (Erosion control materials, including silt fence, geotextiles) Maine Distributor:

E.J. Prescott Inc. P.O. Box 600 32 Prescott Street, Libby Hill Business Park Gardiner, Maine 04345-0600 (207) 582-1851 Attn: Greg Hinkley

Lane's Erosion Control Services (Erosion Control Mulch Mix) 199 Neck Road West Gardiner, Maine 04345 (207) 724-7369 New England Organics (Erosion Control Mulch Mix)

5 Fundy Road

Falmouth, Maine 04105

Local Distributors: Jordan Lumber Company, Kingfield, Tel. 778-1334 (also source of silt fence, other materials);

Norpine Landscape Inc., Kingfield, Tel. 265-2430 (also source for hay bales, seed mixes);