Stantec Consulting Services Inc.
30 Park Drive
Topsham, ME 04086
(207) 729-1199

December 11, 2013
File: 195600539

Attention: Dan Courtemanch
Maine Department of Environmental Protection
17 State House Station
Augusta, Maine 04333-0017

Reference: Bingham Wind Project — Updates to In-Lieu Fee Amount and Proposed Impacts

Dear Dan,

As compensation for unavoidable wetland impacts associated with the proposed Bingham Wind Project (Project), Blue Sky West, LLC and Blue Sky West II, LLC (the Applicants) are proposing a revised In Lieu Fee (ILF) payment of $784,044.55. This payment has been calculated based on both the CMP Mitigation Guidance and the U.S. Army Corps of Engineers (Corps) Table 2 Mitigation Guidance and there is no substantive difference in the ILF amount (Appendix 1). This is a change in the amount of the ILF previously calculated, based on conversations with the Corps. Our original approach was to treat all wetlands as forested. At the request of the Corps, we completed analysis of wetland type and existing use (Appendix B). Wetlands not currently forested are not being considered for compensation as clearing will not occur.

On November 14, 2013, you were provided a Project modification letter that briefly discussed the use of the ILF program to compensate for Project wetland impacts. In this discussion the fee contribution was identified as $1,127,261.85. The fee contribution amount has been revised to reflect actual ground conditions of the landscape associated with the Project and removes all non-forested areas. Many of the wetlands also occur within "working forests," which are actively managed for timber production and regularly harvested. Some of these wetlands have undergone changes from previous canopy cover to a dense scrub-shrub community.

The Project includes:

- Approximately 26.75 acres of permanent cover type conversion along the generator lead;
  - About 3.48 acres of wetland are currently scrub-shrub and will not be converted;
  - Approximately 13.13 acres of the total project conversion will occur within working forest; and
  - 0.28 acres occur adjacent to existing roads.

Approximately 63 percent of the wetland impacts described in the permit applications will not occur because the wetland type is already non-forested areas adjacent to roads (Appendix 2). A more in-depth discussion of existing conditions can be found in Appendix 2, which was previously provided to the Corps and MDEP. Detailed information about each wetland was provided in Section 7, Exhibit 7A, of the Maine Department of Environmental Protection Application. Payment of the ILF will be remitted to the Maine Natural Resources Conservation Program (MNRCP) which is administered by The Nature Conservancy after the permit is written.

Reference: Bingham Wind Project — Updates to In-Lieu Fee Amount and Proposed Impacts

Please do not hesitate call me with questions on the provided information.

Regards,

Stantec Consulting Services Inc.

Dale F. Knapp
Director, Water Resources Division

CC: Peter Tischbein, Corps
Mark Kern, USEPA
Wende Mahaney, USFWS
Robert Roy, First Wind
Dave Fowler, First Wind

Enclosures: Appendix 1 – Compensation and In-Lieu Fee Table
Appendix 2 – August 27, 2013 memo to U.S. Army Corps of Engineers

Appendix 1. Bingham Wind Project In Lieu Fee Calculation Table							
Impact Type	**Associated ILF Multiplier**	**Acres (Piscataquis)**	**Acres (Somerset)**	**Piscataquis ILF Amount $3.08+$0.03**	**Somerset ILF Amount $3.64+$0.04**	**Percent Reduction**	**Total Dollars**
Permanent Wetland Fill (Poles and Generator Lead Access Roads)	1	0.60	0.75	$ 80,841.34	$ 119,655.20	no reductions allowed	$ 200,496.54
Temporary Wetland Fill in PSS/PEM	1	0.88	0.00	$ 119,688.35	$ -	standard reduction to 5% (in place for <18 mos.)	$ 5,984.42
Temporary Wetland Fill in PFO, converted to PSS/PEM	1	5.27	0.17	$ 714,258.15	$ 26,852.96	standard reduction to 15%, habitat conversion	$ 111,166.67
Fill in Vernal Pool	2	0.00	0.00	$ -	$ -	no reductions allowed	$ -
Fill in and/or removal of forest in natural SVP Buffer (≥25%)	2	0.00	0.00	$ -	$ -	no reductions allowed	$ -
Clearing of upland forest or PSS within 100' of stream bank	1	0.25	0.18	$ 34,001.63	$ 29,543.04	standard 10% reduction with BMPs	$ 6,354.47
Clearing of PFO	1	9.15	3.75	$ 1,239,539.02	$ 601,024.96	reduction to 15% applicable to widening only	$ 276,084.60
IWWH Impact: Wetland	2	1.80	0.00	$ 487,081.98	$ -	reductions to 37.5% applicable to widening only	$ 182,655.74
IWWH Impact: Upland	2	1.33	0.00	$ 3,472.32	$ -	standard reduction to 37.5%, habitat fragmentation	$ 1,302.12
							$ 784,044.55

APPENDIX 2

August 27, 2013

Peter Tischbein
U.S. Army Corps of Engineers
Maine Project Office
675 Western Avenue #3
Manchester, Maine 04351

Subject: **Bingham Wind Project: Additional Information on Wetland Conversion and Construction Methods**

Dear Peter:

As requested, this submission provides additional information about the wetland clearing and construction methods along the generator lead that is included in the U.S. Army Corps of Engineers (Corps) Application for the Bingham Wind Project (project). During our August 7, 2013, meeting you requested additional information in order to process this Application as a Category 2 General Permit, based on the definition in Appendix 2 of the Maine General Permit, which states that "mechanical clearing without grubbing or other soil disturbance >3 acres as a secondary impact may still be eligible for Category 2 at the discretion of the Corps." This submission describes the types of conversion expected within wetlands, construction methods, and identifies the ways in which the project will meet the relevant general conditions of the General Permit.

The project includes approximately 26.75 acres of permanent cover type conversion along the generator lead. About 3.48 acres of wetland are currently scrub shrub and will not be converted. As described in Table 1, approximately 13.13 acres of the total project conversion will occur within working forest and 0.28 acres will occur adjacent to existing roads. In sum, for the project, approximately 63% of the wetland impacts described in the permit applications will not occur because the wetland type is already scrub shrub or will be wetland conversion within working forests or adjacent to roads. Detailed information about each wetland was provided in Exhibit B2 and in Figures 19-30 of Exhibit B1, Appendix B of the Corps Application.

Table 1. Summary of Wetland Clearing Impacts along the Generator Lead

Wetland Type	Total Impact (Acres)	Wetland Conversion Working Forest (Acres)			Wetland Conversion Roadside (Acres)		
		PEM	PSS	Modified PFO	PEM	PSS	Modified PFO
PEM	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00
PFO	**26.32**	0.00	11.08	1.82	0.00	0.27	0.01
PFO/PEM	**0.03**	0.03	0.00	0.00	0.00	0.00	0.00
PFO/PSS	**0.40**	0.00	0.20	0.00	0.00	0.00	0.00
PSS	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00
Total	**26.75**	**0.03**	**11.28**	**1.82**	**0.00**	**0.27**	**0.01**

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As described in Section 3.2, Exhibit B-1, Appendix B of the Corps Application, forested wetlands, particularly along the western portion of the Generator Lead, are dominated by red spruce (*Picea rubens*), green ash (*Fraxinus pennsylvanica*), yellow birch (*Betula alleghaniensis*), and northern white cedar (*Thuja occidentalis*) with a smaller component of balsam fir (*Abies balsamea*), black ash (*Fraxinus nigra*), and red maple (*Acer rubrum*). In addition, approximately 11.7 miles of the generator lead have been previously cleared during commercial forestry activities. The majority of these wetlands do not contain large numbers of trees and canopy cover is often less than 20 percent. The center approximately 2 miles of the corridor will be placed in the road shoulder in Parkman and Abbot. The remaining approximately 3.5 miles along the eastern portion is composed of less disturbed communities. Some of the forested wetlands along the eastern portion of the generator lead corridor are dominated by northern white cedar and are characterized by relatively dense canopies and open understories. Other trees present within these northern white cedar-dominated communities include red maple, yellow birch, balsam fir, and green ash.

Appendix A includes photos which depict the typical forested wetlands along the generator lead. Overview maps of the corridor and wetland (excerpted and modified from those submitted as in Exhibit 7A, Section 7 of the Maine Department of Environmental Protection (MDEP) Application and Exhibit B1, Appendix B of the Corps Application) are included as Appendix B.

During construction of the generator lead, the applicant will employ best management practices consistent with the requirements of the General Permit. General Conditions 17, 19, and 21 are particularly relevant for construction and clearing in wetlands, as described below.

GC 17. Heavy Equipment in Wetlands

Construction of the overhead collector line and generator lead requires cutting vegetation to meet ISO-NE Vegetation Maintenance Standards designed to protect against vegetation contacting the wires. The applicant's typical ROW construction and maintenance procedures require the retention of low ground cover to the maximum extent practicable during construction, restoration, and stabilization of areas affected by construction, and ongoing maintenance activities that promote the long-term growth of diverse, healthy, low vegetation. This results in a utility corridor that provides excellent cover for small animals and birds and significant browse habitat for larger mammals. In addition, it prevents soil erosion and sedimentation of surface water and wetland resources.

Generally, crews will commence clearing with whole-tree harvesting machines. The remaining vegetation will be removed or topped by hand-clearing crews and/or mowing and flailing machines. Significant branches that overhang the ROWs and any dead or damaged trees outside the ROWs that could contact the proposed power lines or cause an arc if they fall (i.e., danger trees) also will be removed. Large vegetation cut during initial clearing will be chipped on-site or removed, in accordance with the Maine Slash Law.

Within the areas that will be converted from forested wetlands to scrub shrub wetlands, the applicant shall utilize low ground pressure heavy equipment operating on construction mats. No refueling, maintenance of vehicles or storage of hazardous materials will occur within these wetlands. The equipment expected to be utilized within the forested wetlands includes harvesters, processors and forwarders. There will also be grinders set up along the generator lead route, but these will not typically be located within a wetland area. Construction mats will be installed via upland locations or off existing mats and will not be dragged through the wetlands. If the ground is frozen sufficiently, construction mats may not be required. The applicant will employ an experienced environmental monitor to inspect work within these wetland areas.

GC 19. Work Site Restoration

The project will be constructed in a manner such that any disturbance in wetland areas will be repaired by returning the ground to its original contour and soil layering profile, as needed, and seeding and mulching any bare ground. During construction, temporary mulching will be applied to all disturbed areas within 21 days of initial disturbance and to areas left inactive and unstabilized for a period greater than 7 days. Wetland seed mix will meet the criteria specified in Note 12 on Sheet 11 in Appendix E of the Corps Application. Trees will be cut at ground level and no stumping or grubbing will occur within the resource. Mats may be used in upland areas as well to reduce risk in areas that pose a challenge to stable soil conditions.

GC 21. Sedimentation and Erosion Control

Temporary erosion and sedimentation control measures will be implemented during construction of the project. The project will be constructed based upon sound conservation practices, including as applicable, those outlines in the "Maine Erosion and Sediment Control Best Management Practices" manual published by the Bureau of Land and Water Quality, MDEP (March 2003), and past experience of the applicant in constructing wind projects in Maine.

Details of erosion and sedimentation control (ESC) for the construction of the electrical generator lead are included in Appendix E, Sheets 11-13 of the Corps Application. For example,

- Erosion and sediment control measures shall be installed prior to the start of construction and shall be maintained until final stabilization is achieved.
- The contractor shall inspect ESC measures once every seven days and within 24 hours of significant runoff events, including those that result in discharge of stormwater from the site. Daily inspections shall be conducted during the winter construction period.
- Temporary erosion and sediment control devices shall be removed and those adjacent areas restored upon completion of the work or when so ordered by the engineer. Exposed soil resulting from the removal of temporary ESC measures shall be raked, seeded and mulched or matted as needed.
- Permanent seed mix shall be used as early as practicable between May 15 and September 1. Temporary seed mix shall be used between September 1 and May 15.
- Temporary mulching is to be applied to all disturbed areas within 21 days of initial disturbance and to areas left inactive and unstabliized for a period greater than 7 days at a rate of 2 tons/acres, unless 1) stabilization is not required if work is to continue in the area within the next 24 hours and there is no precipitation forecast for the next 24 hours, or 2) stabilization is not required if the work is occurring in a self-contained excavation (i.e., no outlet) with a depth of 2 feet or greater (e.g. utility trenches).
- Permanent stabilization within the resource areas will occur at the earliest date possible.

In addition, for your reference, we have attached a more detailed description of the erosion and sediment control practices that was included in Section 14 of the MDEP Application as Appendix C.

In summary, based on the conversion of common wetland types and the methods in which the project will comply with the relevant General Conditions, this project should be processed under the Maine General Permit.

Stantec

Please do not hesitate call me with questions on the provided information.

Sincerely,
STANTEC CONSULTING

Dale F. Knapp
Director, Water Resources Division

CC: Daniel Courtemanch, MDEP
Mark Kern, USEPA
Wendy Mahaney, USFWS
Josh Bagnato, First Wind

Enclosures:

Appendix A: Photos of Typical PFO Wetlands along Generator Lead
Appendix B: Modified Delineated Natural Resource Maps
Appendix C: Section 14 of MDEP Application describing Basic Standards incorporated into project construction for Erosion and Sediment Control

Appendix A
Representative Photographs

Project photographs were taken during wetland delineation surveys conducted by Stantec Consulting between 2009 and 2012.

Roadside Forested Wetlands

ABB_W378

ABB_W382

ABB_W385

Stantec

PARK_W373

PARK_W375

Existing or Regenerated Forested Wetlands

ABB_W385

PARK_W395

PARK_W396

Stantec

PARK_W409

PARK_W411

Working Forested Wetlands

KING_W322

KING_W329

KING_W332

Stantec

KING_W341

KING_W345

KING_W346

Stantec

KING_W354

ABB_W391

MAY_W208

Stantec

PARK_W361

PARK_W399

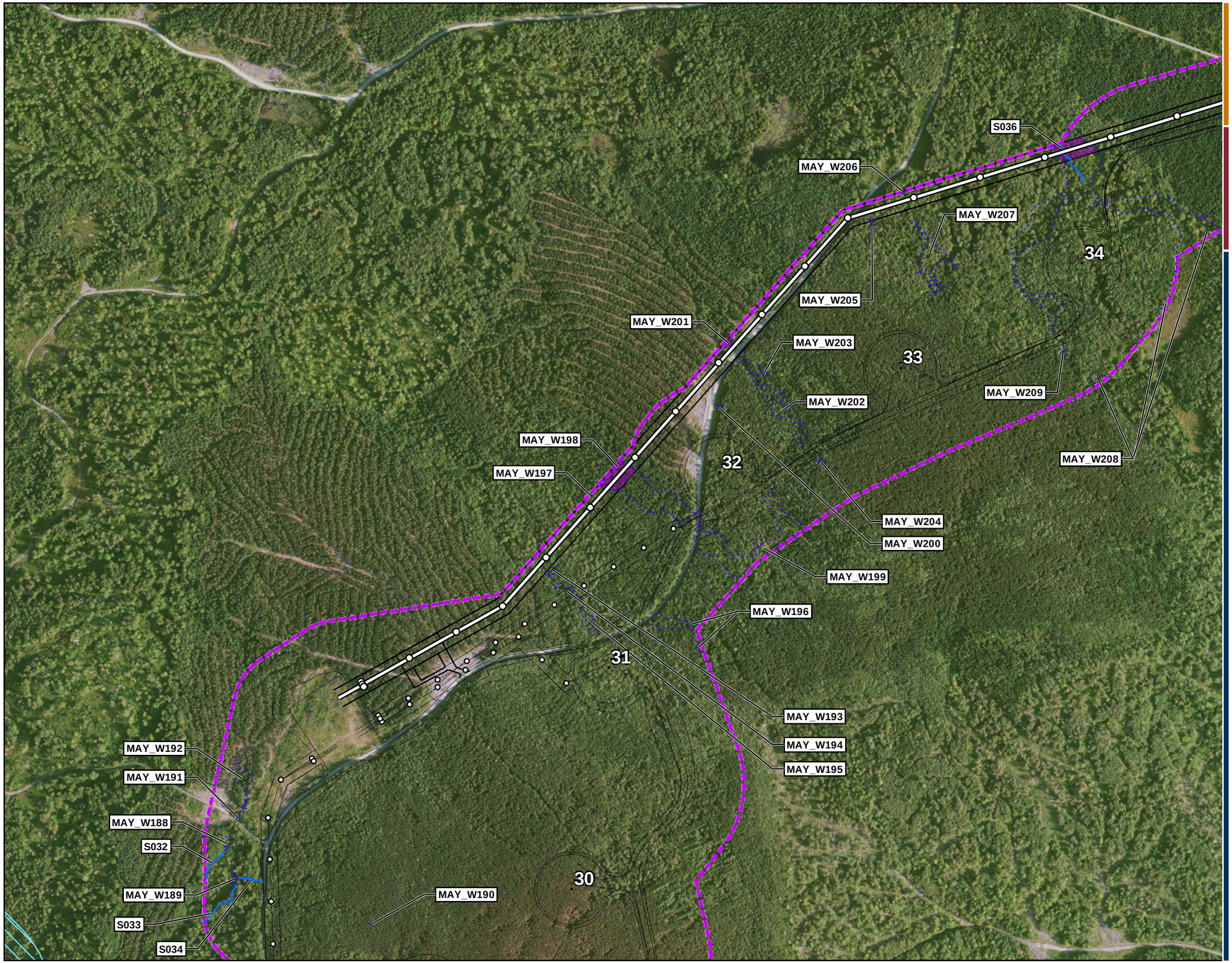
PARK_W406

Stantec

Appendix B

Modified Delineated Natural Resource Maps

Stantec



Generator Lead Wetland Types PEM PFO PFO/PEM PFO/SS PSS

Title

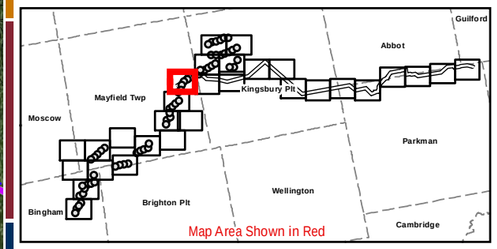
Delineated Natural Resource Map

Figure No.

14

Client/Project

Bingham Wind Project



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Feet

Legend

- VP Vernal Pool Identified by Stantec
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- Stream Identified by Stantec
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- Utility Pole
- Site Plan
- Clearing Limits
- Electrical Generator Lead
- Plisga & Day Surveyed Township Boundary
- USGS Township Boundary
- 2' Contours

Notes

1. Not all items appear in all maps.
2. Wetland boundaries delineated in accordance with USACE 1987 Wetland Delineation Manual or subsequent versions. Vernal pools surveyed in accordance with Maine Association of Wetland Scientists 2010 Interim Vernal Pool Survey Protocol, April 2010.
3. Wetland and vernal pool boundaries were located utilizing a Trimble PRO Series Receiver. Expected accuracy of GPS data is within 1 to 2 meters of actual position.
4. Basemap features comprised of photogrammetry provided by Aerial Survey and Photo.
5. Civil Design dated 3/6/13 provided by Deluca Hoffman.
6. Aerial imagery provided by ESRI aerial imagery web mapping service.
7. Inland Waterfowl and Wading Bird Habitat and Deer Wintering Areas provided by the Maine Department of Inland Fisheries and Wildlife.

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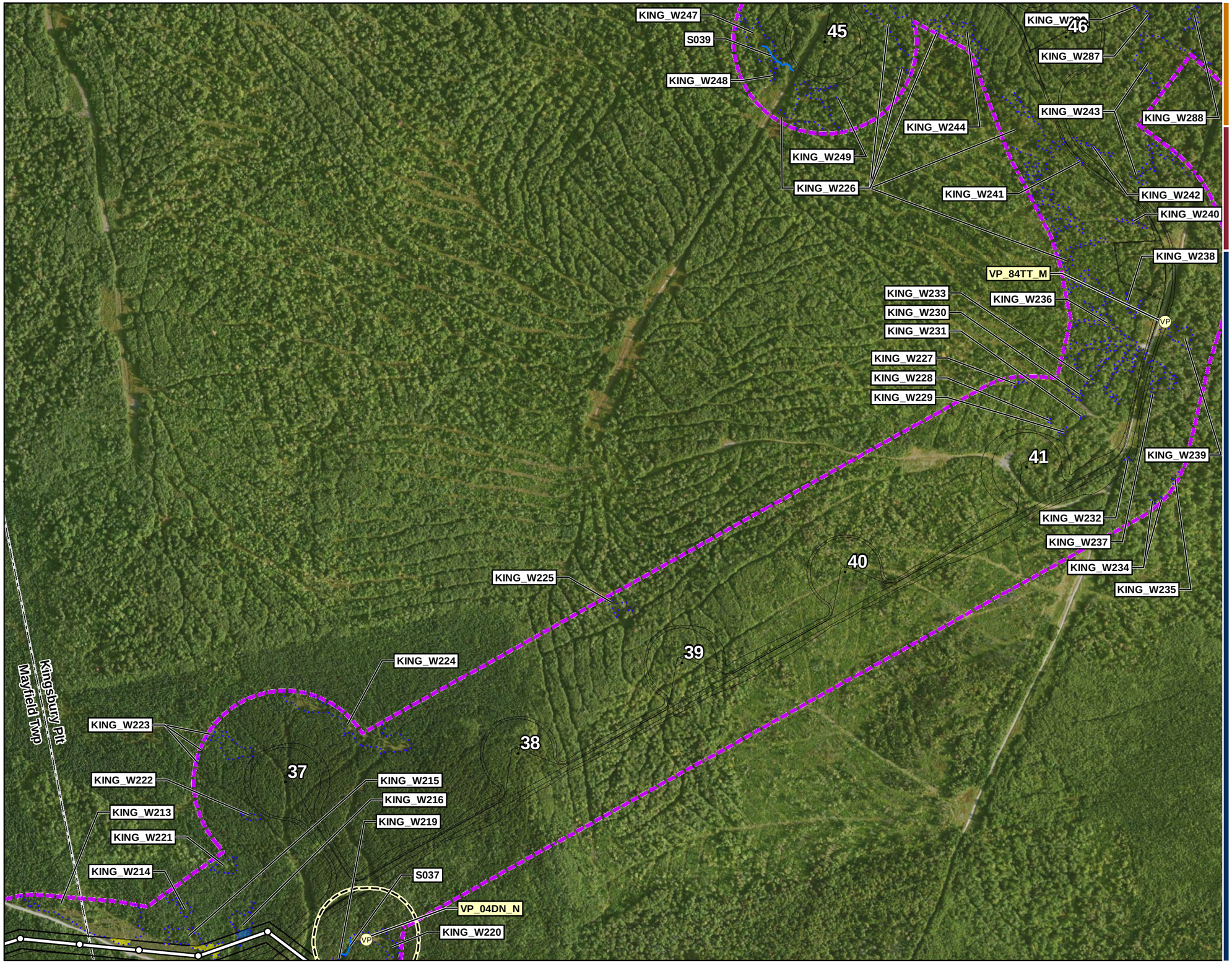


Generator Lead Wetland Types PEM PFO PFO/PEM PFO/PSS PSS

Title

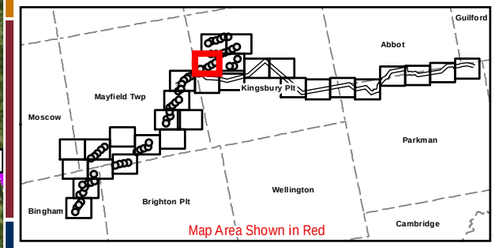
Delineated Natural Resource Map

Figure No.

15

Client/Project

Bingham Wind Project



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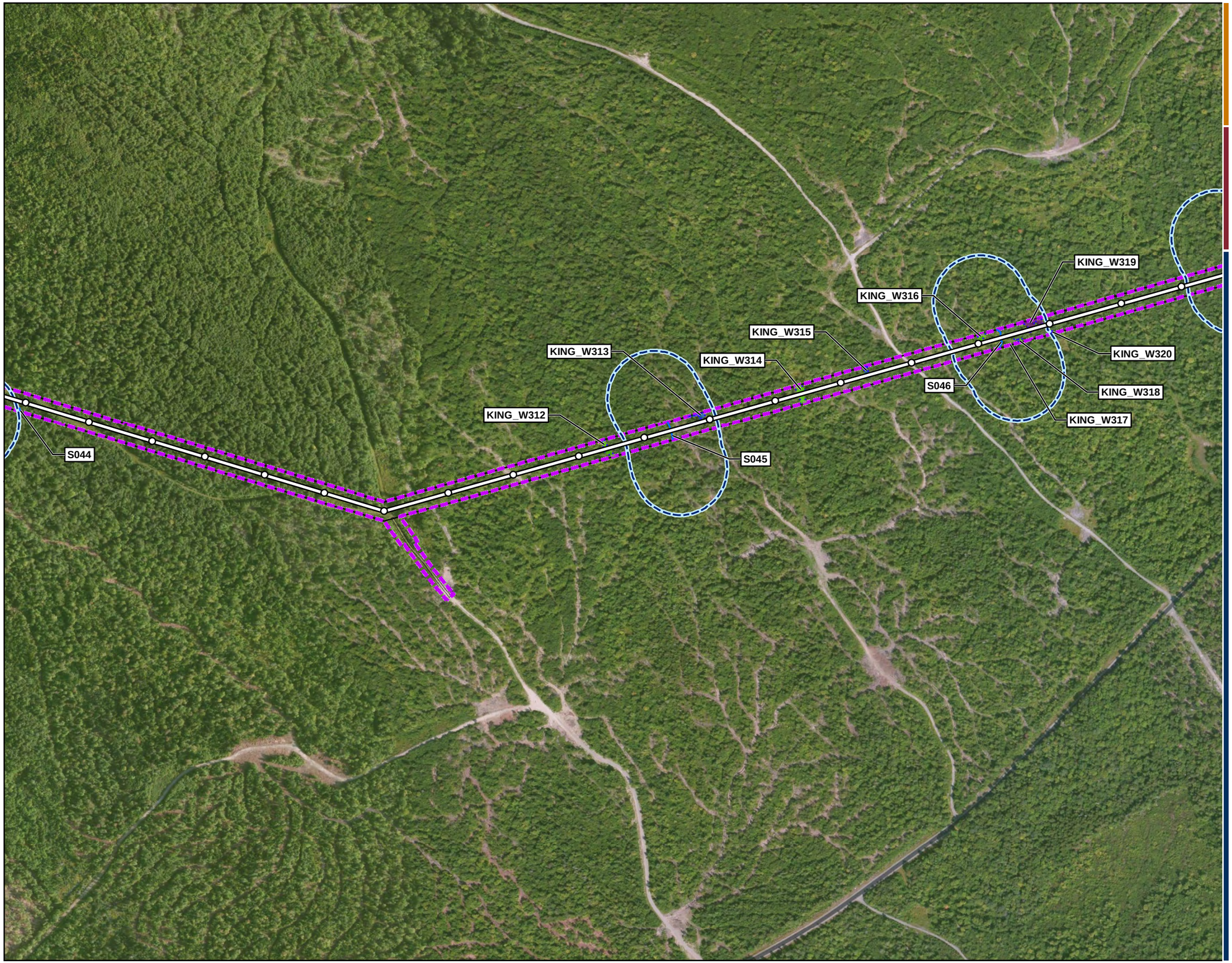

Generator Lead Wetland Types PEM PFO PFO/PEM PFO/SS PSS

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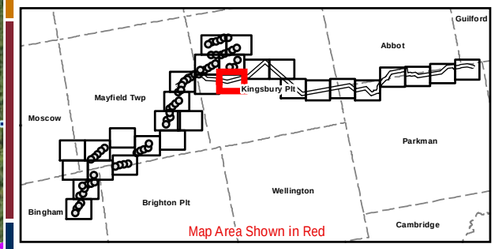
Delineated Natural Resource Map

Figure No.

20

Client/Project

Bingham Wind Project



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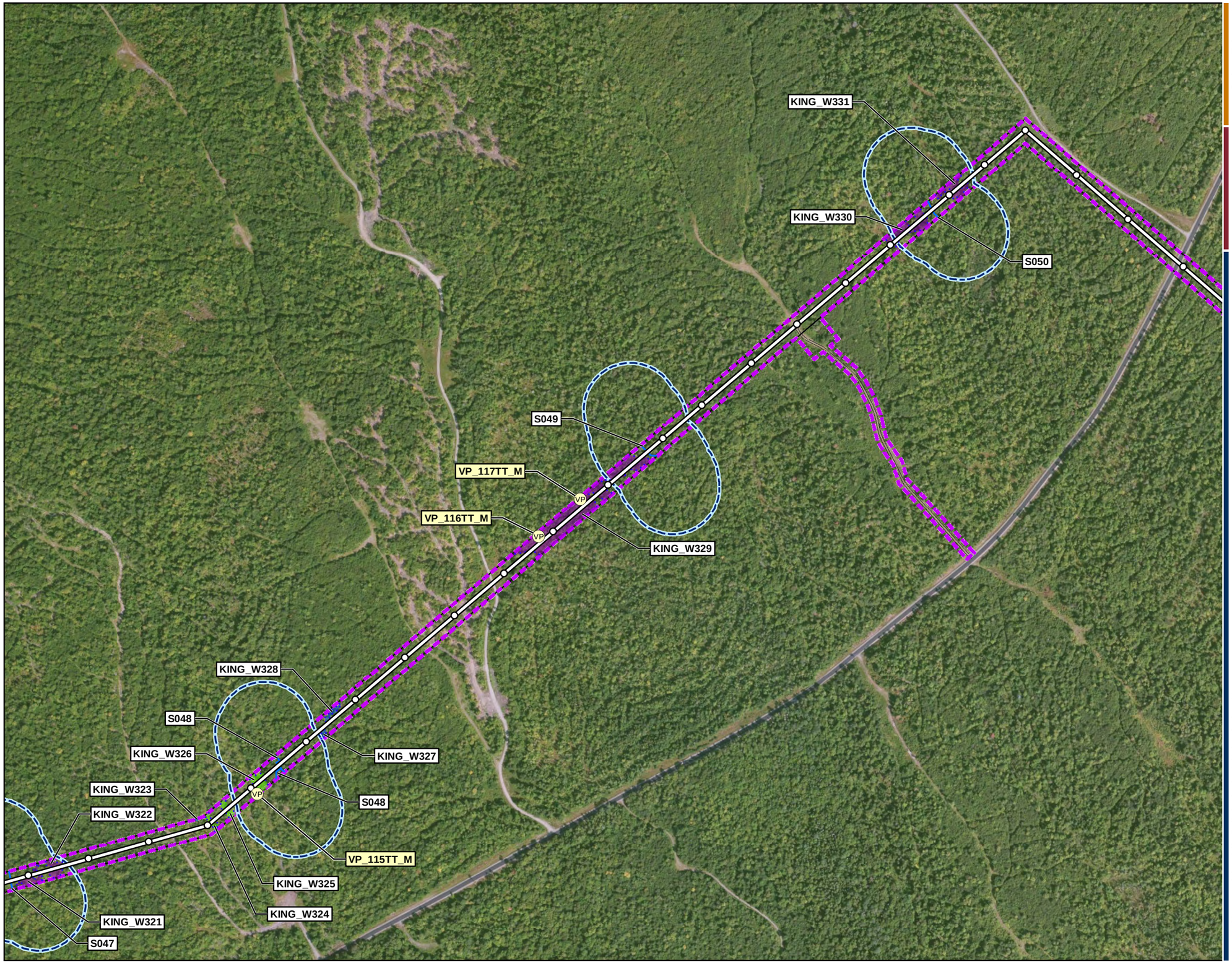

Generator Lead Wetland Types PEM PFO PFO/PEM PFO/PSS PSS

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Delineated Natural Resource Map

Figure No.

21

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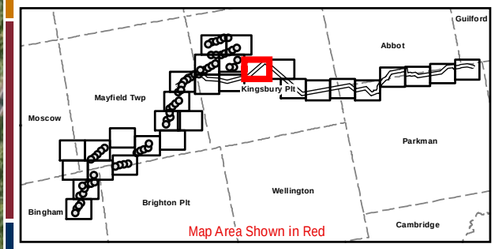
Bingham Wind Project



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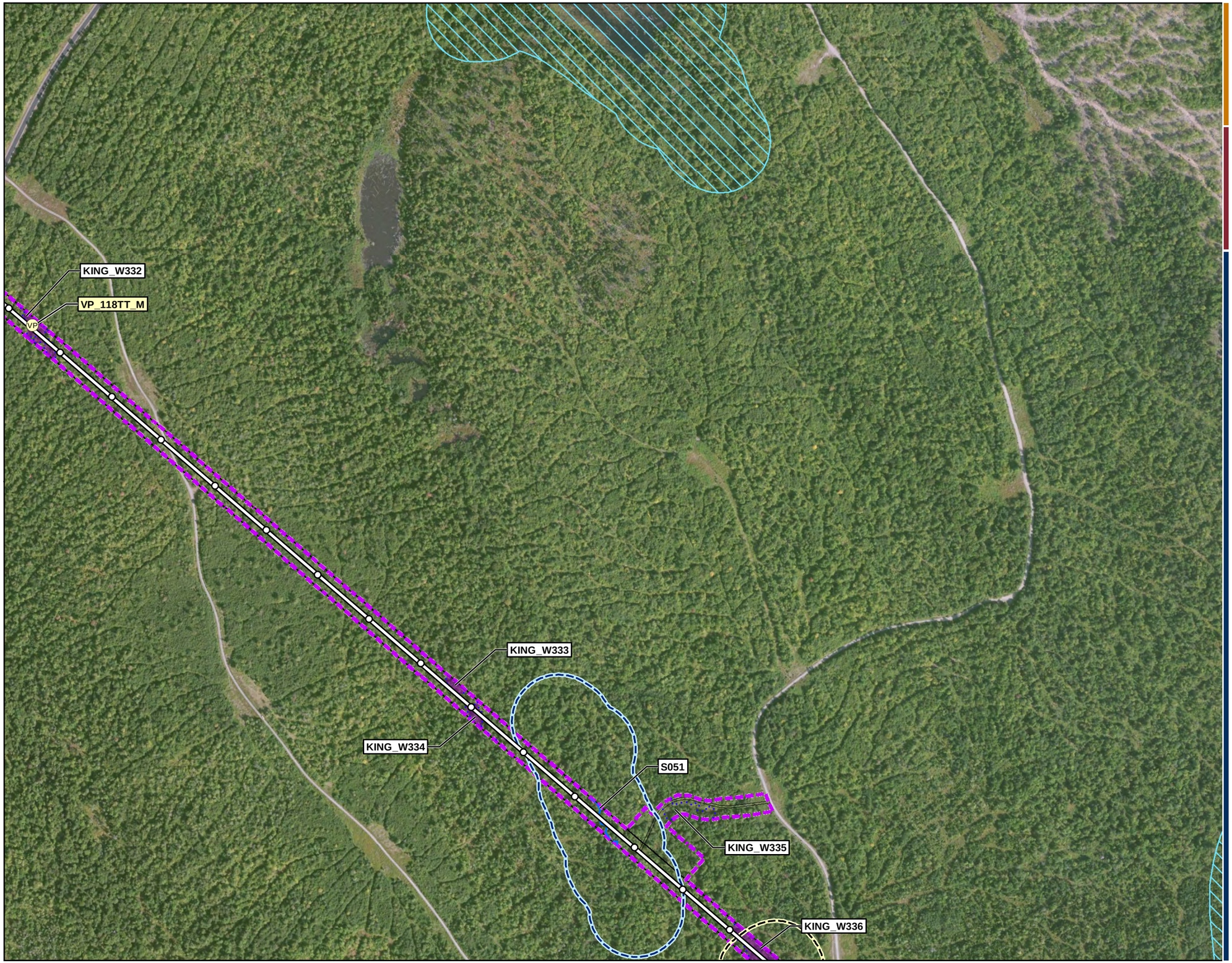

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Delineated Natural Resource Map

Figure No.

22

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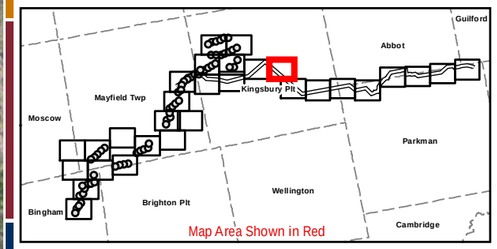
Bingham Wind Project



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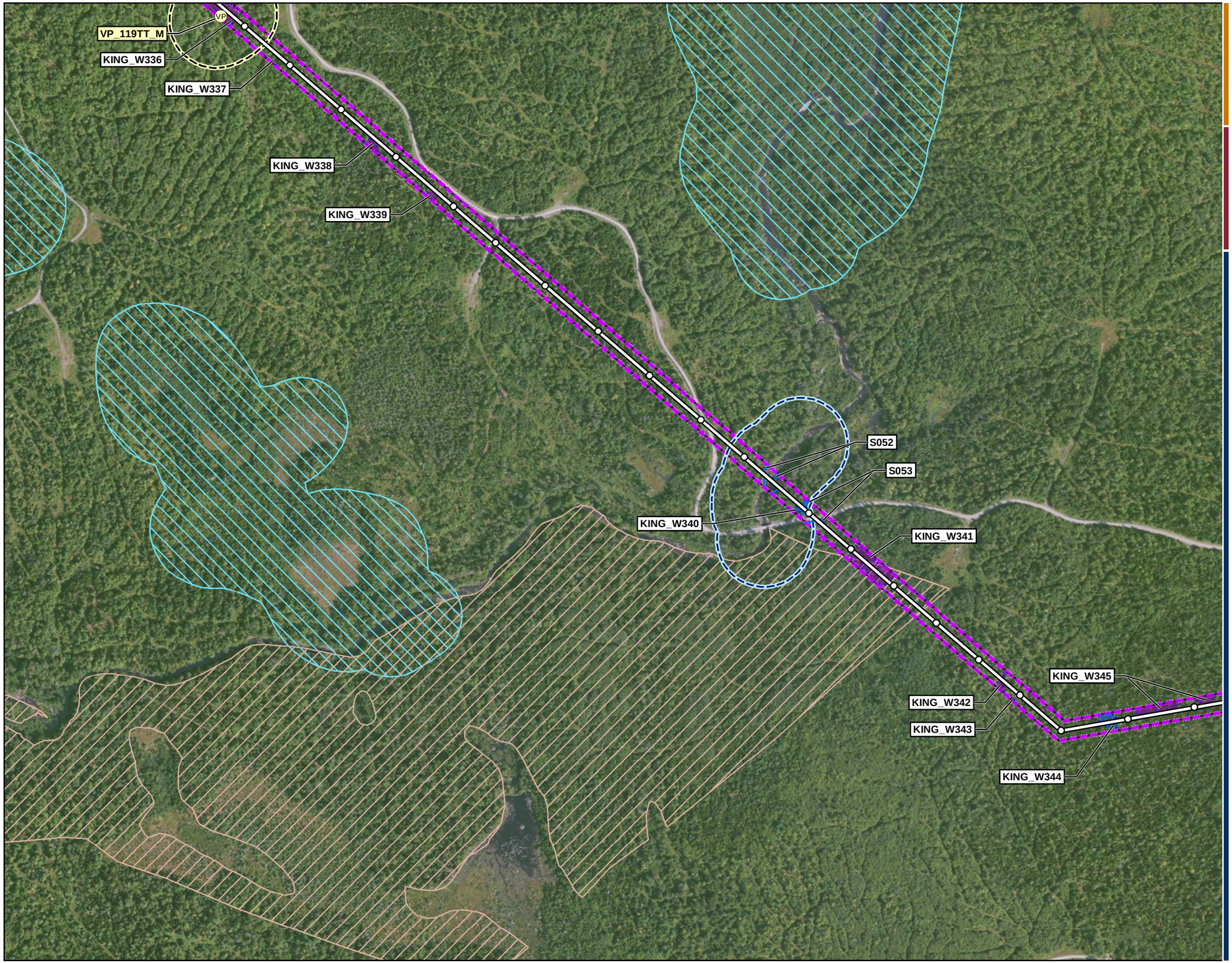

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Delineated Natural Resource Map

Figure No.
23

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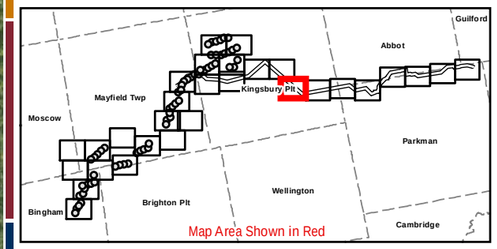
Bingham Wind Project



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Generator Lead Wetland Types PEM PFO PFO/PEM PFO/SS PSS

Title

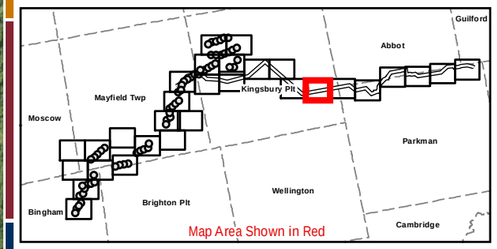
Delineated Natural Resource Map

Figure No.

24

Client/Project

Bingham Wind Project



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Feet

Legend

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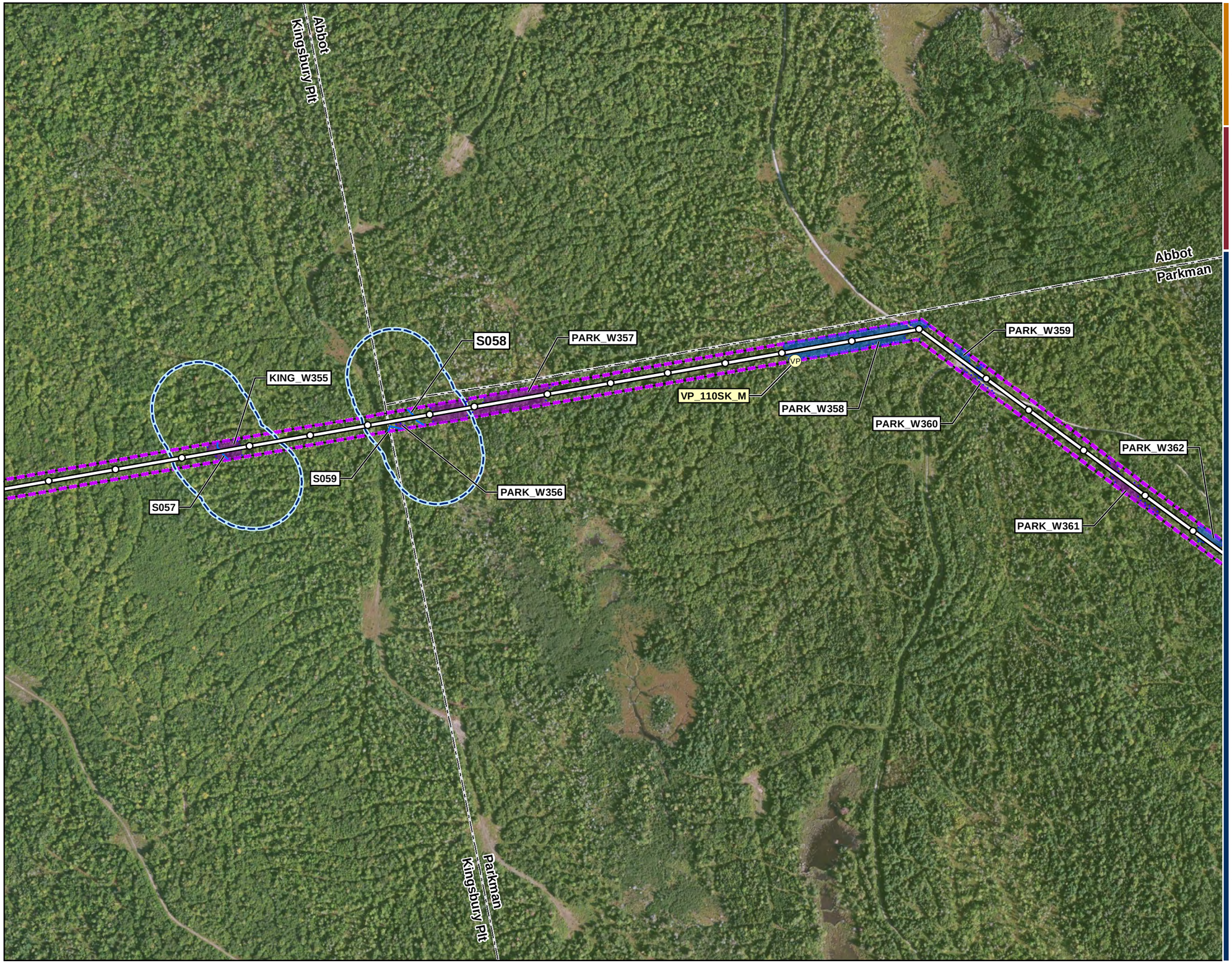


Generator Lead Wetland Types PEM PFO PFO/PEM PFO/SSS PSS

Title

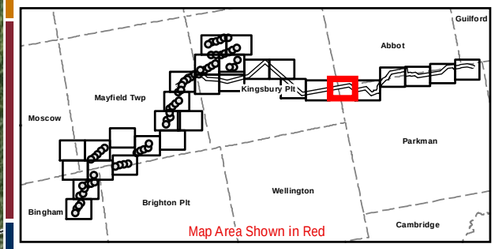
Delineated Natural Resource Map

Figure No.

25

Client/Project

Bingham Wind Project



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Feet

Legend

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Abbot
Parkman

PARK_W374
S065
PARK_W373
S064
PARK_W372
PARK_W364
PARK_W365
PARK_W366
PARK_W371
S060
PARK_W363
S061
S063
S062
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PARK_W414
PARK_W367
VP_109SK_M
VP_153TT_M
PARK_W368
PARK_W370
PARK_W369
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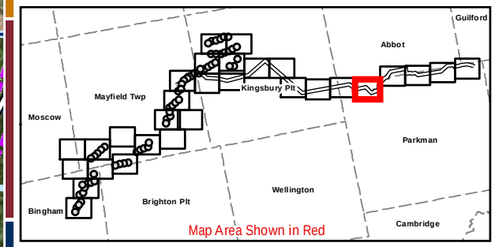
Generator Lead Wetland Types PEM PFO PFO/PEM PFO/PSS PSS

Title
Delineated Natural Resource Map

Figure No.
26

Client/Project
Bingham Wind Project



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Legend

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Generator Lead Wetland Types PEM PFO PFO/PEM PFO/SS PSS

Title

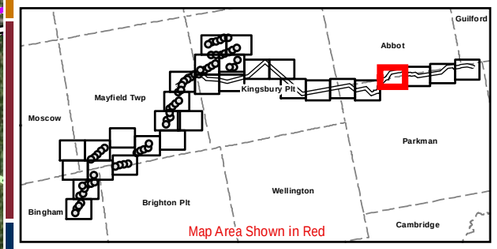
Delineated Natural Resource Map

Figure No.

27

Client/Project

Bingham Wind Project



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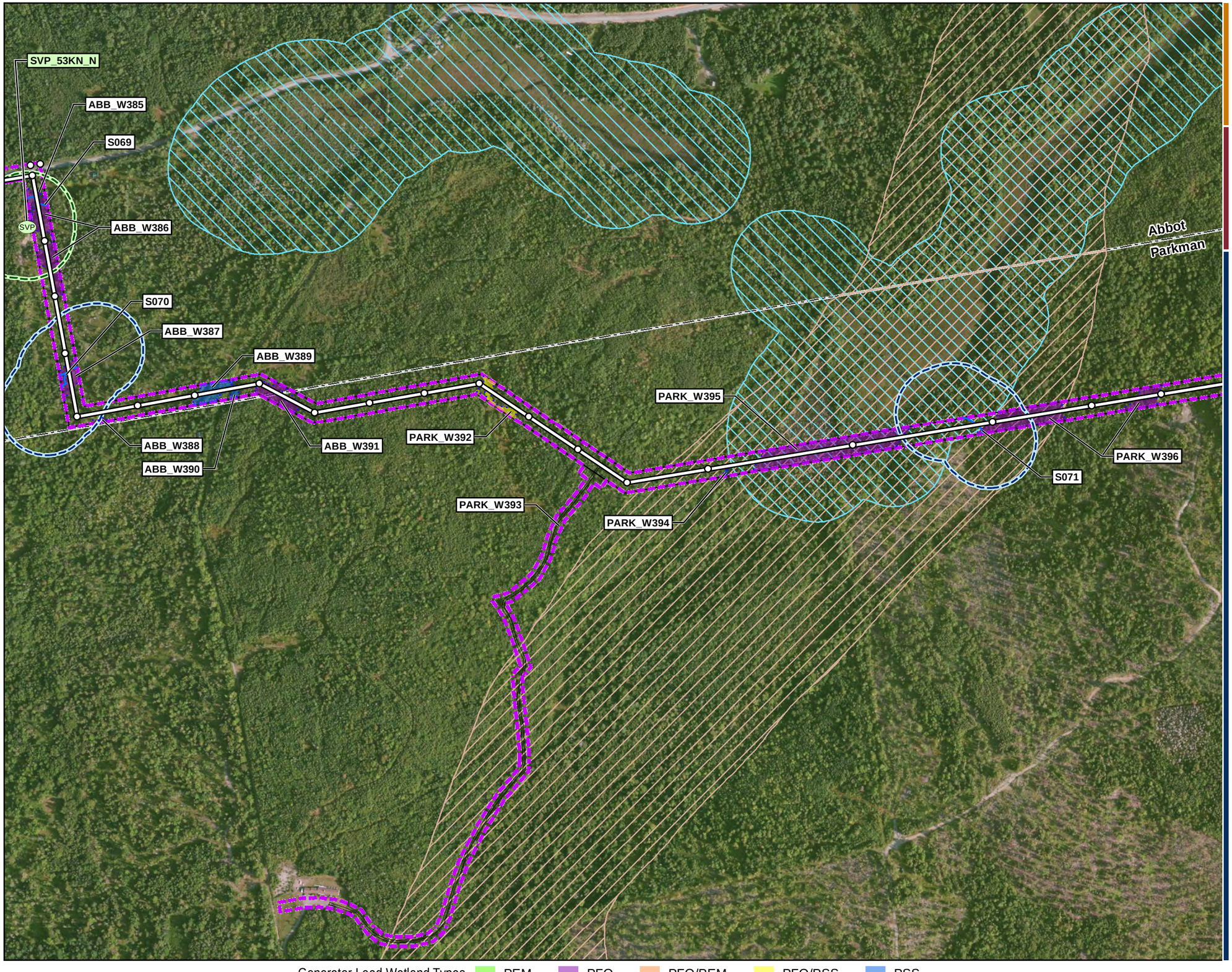


Generator Lead Wetland Types PEM PFO PFO/PEM PFO/PSS PSS

Title

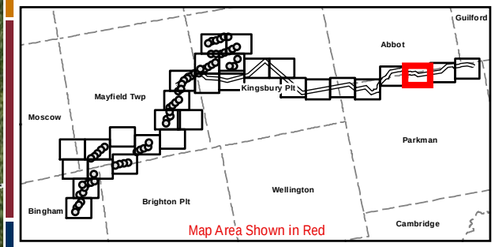
Delineated Natural Resource Map

Figure No.

28

Client/Project

Bingham Wind Project



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Feet

Legend

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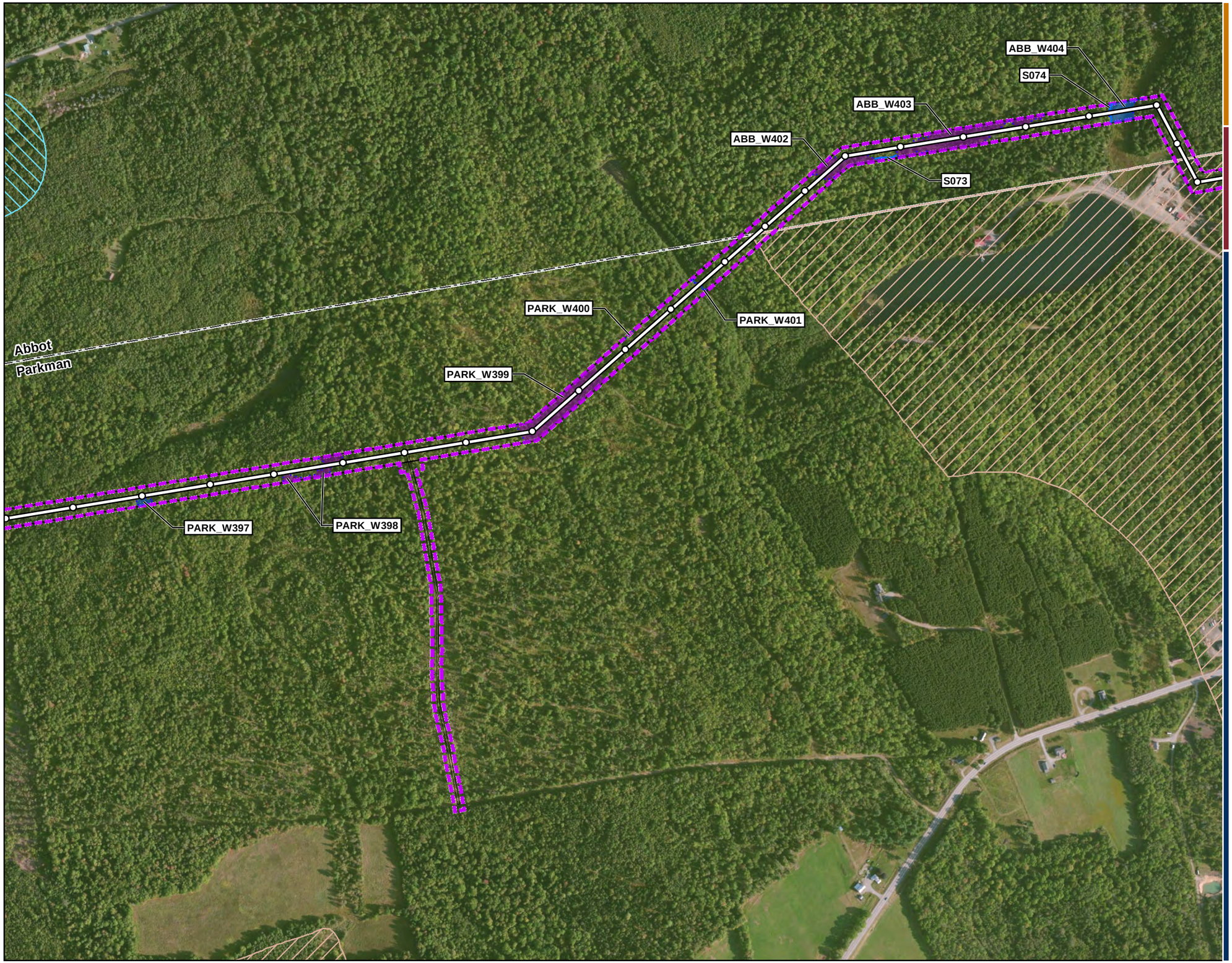

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29

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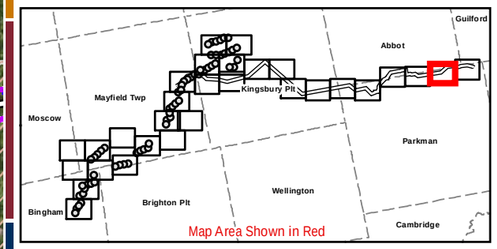
Bingham Wind Project



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Feet

Legend

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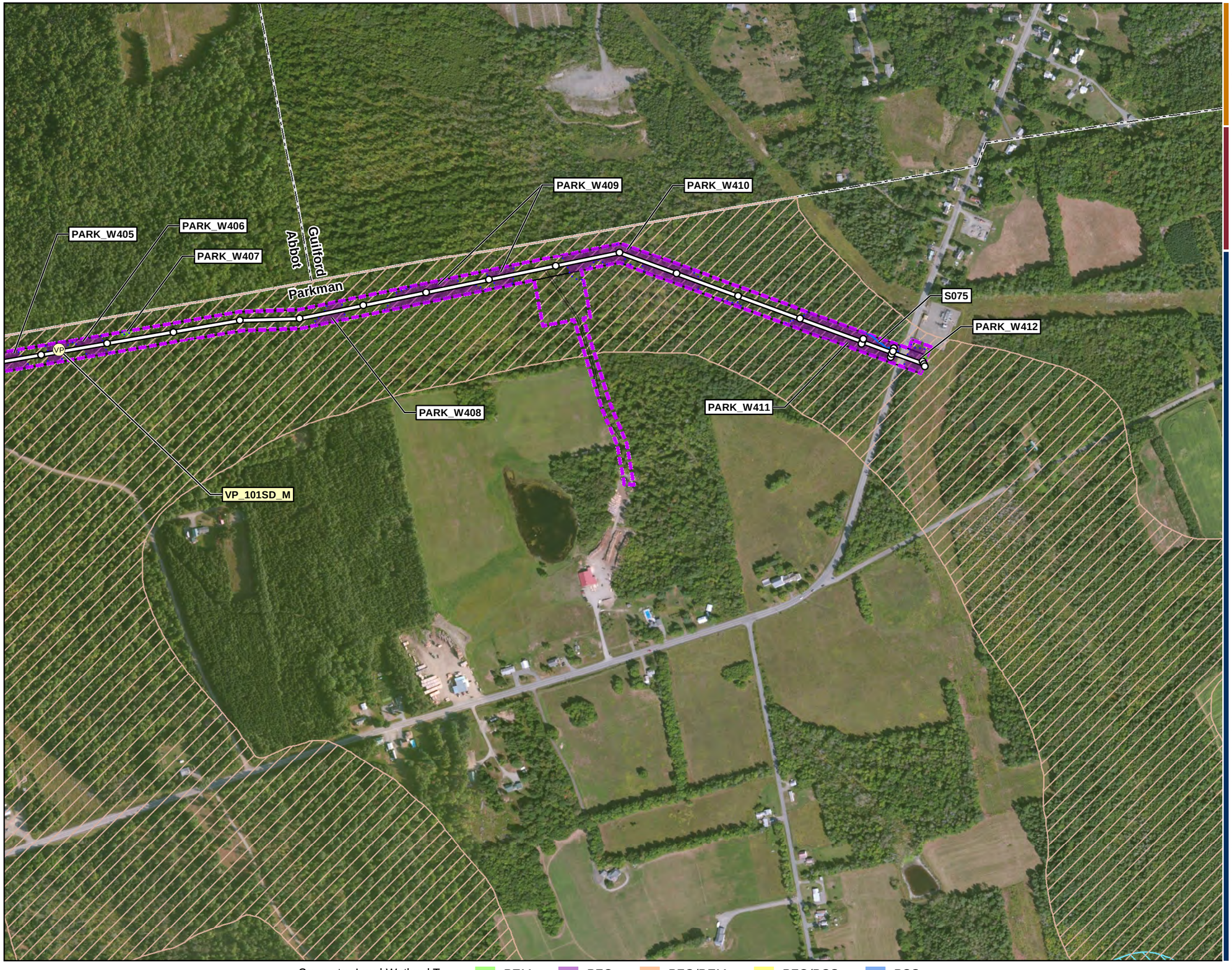


Generator Lead Wetland Types PEM PFO PFO/PEM PFO/PSS PSS

Title

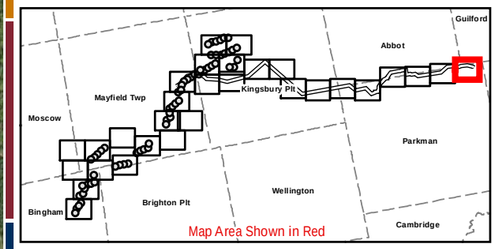
Delineated Natural Resource Map

Figure No.

30

Client/Project

Bingham Wind Project



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Feet

Legend

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Appendix C

Section 14 of MDEP Application

Basic Standards for Erosion and Sediment Control

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14.0 BASIC STANDARDS

14.1 INTRODUCTION

The following plan has been developed to provide a strategy for controlling erosion and sedimentation associated with the Bingham Wind Project (project) both during and after site construction (Maine Construction General Permit). The project is a proposed utility-scale wind energy facility located in Somerset and Piscataquis Counties, Maine, and includes 62 wind turbines (63 potential turbine locations are being permitted), existing and new access roads and crane paths, up to 5 temporary and up to 5 permanent meteorological towers, an Operations and Maintenance (O&M) building, 34.5-kilovolt electrical collector lines (the majority of which will be buried alongside project roads), a collector substation, a dynamic reactive device (DRD), and an approximately 17-mile electrical generator lead. This plan is based upon sound conservation practices, including as applicable, those outlined in the "Maine Erosion and Sediment Control Best Management Practices" manual published by the Bureau of Land and Water Quality, Maine Department of Environmental Protection (MDEP; March 2003), and past experience of the Applicants in constructing wind projects in Maine.

Details of erosion and sedimentation control during the construction of roadways and turbine pads can be found in the civil design plan included within Exhibit 1. Details of erosion and sedimentation control during the construction of the O&M building and substation facilities are located on sheets C-9.0 and C-9.1 of Exhibit 1. The electrical generator lead erosion and sedimentation control can be found in the electrical design plan of Exhibit 2.

14.1.1 Stormwater Management Measures

Additional measures may be required to protect new stormwater conveyance or management systems due to changes in actual site conditions. For more information on stormwater management, see Section 12. For additional information on buffers, the contractor shall reference the Maine Stormwater Best Management Practices Manual, Volume III: BMP Technical Design Manual Chapter 5, Vegetated Buffers (revised June 2010).

14.2 FIELD ADJUSTMENTS

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

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

do not impact a new landowner without proper title and/or notifications; and meet the requirements of MDEP Chapter 500 Stormwater Management Standards. Any of these adjustments will be reflected in the final as-built drawings.

(a) Examples of adjustments that may be made during construction and/or final design without advance notice to MDEP:

- Reduction in clearing, impervious surface, or size of structure; elimination of a structure; or relocation of a structure;
- Location, dimension or addition of drainage culverts, level spreaders, rock sandwiches or other stormwater infrastructure, provided that the culvert does not convey a regulated stream and that the hydraulic capacity of the modified stormwater infrastructure meets design standards;
- Changes to pole or anchor locations for the electrical collector, provided that any adjustment meets the buffer requirements as defined in Section 10;
- Maintenance within the footprint of existing roads with exception of any in-stream work or wetland impacts to be used for temporary construction access;
- Changes of up to 10 feet in vertical roadway alignment and turbine pad elevation; and
- Changes of up to 300 feet in either direction in horizontal roadway alignment and associated clearing, and in turbine or met tower clearing area, and in electrical collector alignment laydown/staging areas.

(b) May be made upon prior approval by the third-party inspector or MDEP staff:

- Changes other than those identified in (a) and that do not otherwise require a permit amendment as determined by MDEP.

14.3 CONSTRUCTION CALENDAR

The Contractor is required to give special attention to the sections pertaining to fall and winter construction, as well as to sensitive areas and requirements for temporary seeding, dormant seeding, and mulching.

14.3.1 Definitions

The following definitions are terms commonly used throughout this plan.

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

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

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

Clearing – Includes cutting and removing of vegetative cover. It does not include grubbing. Limited cutting, thinning, use of heavy equipment, and other clearing restrictions will apply to sensitive areas and wetland crossings (Section 10).

Critical Areas – Specific areas identified herein or subjected to significant erosion problems as observed in the field prior to, during, or following construction activities such as areas with steep slopes or channels in excess of eight percent, newly graded slopes, highly erodible soils that will be exposed for more than seven days, or bare soils exposed during late fall and winter when no vegetation can grow.

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

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

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

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

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

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

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

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

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

14.3.2 Schedule of Activities

The following activities, erosion control measures, or other items are required for the construction of this project or require specific measures or scheduling of activities to be conducted or restricted during the various construction seasons as defined above.

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

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

Erosion and Sedimentation Controls Installation – Erosion control installation shall occur all year long, except that such measures shall be installed prior to commencement of disturbance activities related to each erosion control measure. See design plans for locations and installation procedures.

Road Construction – This construction may occur in the spring, summer, and fall seasons. It will also be allowed in the winter season, however, the winter construction schedule must be followed (see Section 14.5.1 below). The following requirement for access road construction will be adhered to in order to prevent erosion from taking place during winter construction:

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

Temporary Timber Mat Bridge – Temporary timber mat bridges will be used throughout the year as necessary for clearing and construction activities. Installation and removal of temporary timber mat bridges will proceed according to the following sequence:

  - Install erosion controls at the down-gradient perimeter of work adjacent to the stream resource.
  - Strip topsoil beneath the temporary bridge supports and stockpile for replacement following construction.
  - Place sand leveling material and geotextile fabric to create a stable base for bridge supports.
  - Place timber bridge supports and span.

- Place gravel as necessary to create a smooth transition onto bridge.
- Remove bridge following construction, re-grade area with stockpiled topsoil, and reseed/restore per the project restoration plan.
- Remove barrier erosion controls following final stabilization/restoration of the crossing.

14.4 EROSION CONTROL MEASURES

14.4.1 General

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

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

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

Dust Control – Contractor shall take necessary steps to control blowing and airborne movement of dust from exposed soil surfaces. Maintaining natural or temporary vegetation and/or mulching shall be used where practical. Mechanical sweepers shall be used where necessary to prevent and remove dust buildup on paved surfaces. Regularly traveled soil surfaces shall be maintained to minimize dust by periodically moistening bare areas with adequate water to prevent dust (for water sources, see Section 16, Water Supply). Calcium Chloride may be used in areas experiencing significant dust problems and to reduce frequency of watering. Repetitive treatment shall be applied as necessary to accomplish adequate dust control (refer to Section B-5 in the “Maine Erosion and Sediment Control Best Management Practices” manual).

Erosion Control Mix Berms – May be installed in locations that do not have a concentrated flow. Erosion control mix berms are an approved alternative to silt fence provided they are not located in sensitive areas described above. Erosion control mix may be manufactured on or offsite and

shall follow the guidelines outlined in Section B-1 in the "Maine Erosion and Sediment Control Best Management Practices." The composition specification outlined in Section B-1 should be used a guideline but the actual mix design will be performance based. The mix shall be subject to testing if required by the Engineer.

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

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

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

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

Riprap – Shall be used in swales, steep slopes, and outlets as shown on the design plans to protect soils from excessive flow velocities. It shall be of the size and depths specified on the design plans; angular stone shall be used. Riprap may be required at locations where

revegetation matting, high velocity ditch lining or soft armor is proven to be ineffective in the field as directed by the Engineer.

Sediment Barrier Berms – A sediment barrier is a berm installed across or at the toe of a slope and down gradient of disturbed earth. Its purpose is to intercept and retain small amounts of sediment from disturbed or unprotected areas of limited extent. For other sediment barrier use, see Section B-1 of the "Maine Erosion and Sediment Control Best Management Practices" manual. A sediment barrier is used where:

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

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

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

Temporary Mulching – Shall consist of spreading of straw (or hay) mulch or erosion control mix over bare or disturbed areas. It shall be applied at the rates described in the *Temporary Seeding and Mulching Schedule* described below. Alternate mulch materials or methods such as hydro seeding may be used only when approved by the Engineer. Mulching shall be substituted with matting in locations where it has proven to be ineffective in the field. Mulching rates shall be doubled where requested by the Engineer based on observations in the field or in locations undergoing winter construction.

14.5 EROSION CONTROL EXECUTION

14.5.1 General Construction Phase

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

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

Construction Traffic – Construction traffic will be directed over the stabilized construction entrances and proposed roads. The crushed stone construction entrances shall be maintained with the addition of more crushed stone as needed or as the voids become filled. The public roadway shall be swept as soon as possible should mud be tracked onto it.

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

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

Grading – Grading will be held to a maximum 2:1 slope where practical. Greater slopes may be used in ledge cut or stable material as shown in the design drawings. Finish-graded areas shall be stabilized with permanent seeding and mulching or other accepted means immediately after final grading is complete. If final grading will not be completed immediately, refer to the *Temporary Seeding and Mulching Schedule* detailed below. It is understood that immediately means within five days of the completion of work. For time periods longer than five days, refer to *Permanent Seeding and Mulching Plan* below.

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

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

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

- Loam will be spread over disturbed areas and graded to a uniform depth and a natural appearance. Loam shall be as specified or approved by the Engineer.
- Final seeding shall be completed immediately (within 7 days) following final topsoil and loam grading. All final fertilizing and seeding shall adhere to these specifications unless otherwise approved by the Engineer.
- Areas shall be mulched immediately after seeding. Immediately upon first signs of any evidence of significant erosion occurring, the Contractor shall repair and mulch all such areas until the area is stabilized. Mulching shall consist of hay mulch, hydro-mulch, or any suitable substitute deemed acceptable by the Engineer. Mulching shall be monitored according to the *Monitoring Schedule* above. Should mulching prove to be ineffective, netting or matting shall be used in its place.
- Straw mulch shall be applied at the rate of 2 tons per acre (90 pounds or 2 bales/1,000 square feet) unless otherwise specified.
- Hydro-mulch shall consist of a mixture of tackifier, wood fiber or paper fiber and water sprayed over a seeded area. Hydro-mulch shall not be used during the fall, winter, or mud season unless approved by the Engineer.
- Dormant seeding shall not occur unless approved by the Engineer. Should seeding be necessary between November 1 and April 15, the following procedure shall be followed.
    - Only unfrozen loam shall be used.
    - Loaming, seeding, and mulching will not be done over snow cover. If snow exists, it must be removed prior to placement of seed.
    - No permanent seeding will be done during fall, winter, or mud season unless specifically approved by the Engineer. If attempted, the normal seed application rate shall be doubled. Reseeding in spring by Contractor will be required in all areas with insufficient growth.
    - Where temporary seeding is required, the rates specified in the *Temporary Seeding and Mulching Schedule* below shall be adhered to.

  - Fertilizing, seeding, and mulching shall be done as soon as possible after the loam is spread. Winter mulch rates shall apply as specified in the *Temporary Seeding and Mulching Schedule* below.
  - On slopes greater than 3:1, straw matting or excelsior matting may be substituted for mulch. Biodegradable netting over mulch may be applied where required by the Engineer.
  - Following final seeding, the site will be inspected every 30 days until 80 percent cover has been established. Reseeding and mulching shall be carried out in areas where inadequate catch is observed until adequate growth is established in seeded areas, as agreed upon by the Engineer. The Contractor may be required to reseed during the following spring subsequent to winter or fall construction and seeding in order to provide 90 percent vegetative cover as required for Acceptance by the Owner.
- Erosion control mix utilized for permanent stabilization and to promote natural revegetation may be used in lieu of loaming and seeding.

Temporary Seeding and Mulching Schedule – During construction, all disturbed areas shall adhere to the schedules specified in Tabled 14-1 and 14-2 below. Refer to *Permanent Seeding and Mulching Plan* above for permanent seeding and mulching requirements.

- The Contractor shall be responsible for monitoring daily weather reports when working in identified sensitive areas and for monitoring weekly reports in all other areas. The Contractor shall adjust the work schedule in anticipation of rains and shall stabilize the site as indicated or required.

- All completed areas that have been loamed and/or finish graded shall be permanently reseeded in accordance with the *Permanent Seeding and Mulching Plan* above.

- Temporary mulching and/or seeding shall commence immediately following initial fine grading of any area expected to remain bare for an interim period of more than 30 days (7 days for sensitive and critical areas). Stabilization or seeding requirements shall be determined in accordance with Tables 14-1 and 14-2 and shall be implemented at the beginning of the expected interim period. In no case shall any bare areas remain untreated for more than 30 days (7 days for sensitive and critical areas).

- Interim periods for sensitive and critical areas are indicated in the Tables 14-1 and 14-2. However, exposed or bare soil in these areas shall be mulched at the completion of work, each day, if significant rainfall is predicted or eminent.

- Mulch application rate shall be doubled during winter construction. Where practicable, mulch should be applied at the end of each day's work for areas that have been fine graded or if snow is predicted or eminent. In no case shall any areas be left bare for more than 15 days during winter construction.

- Permanent seeding shall not be attempted during the fall or winter seasons unless otherwise approved by the Engineer. Should seeding be approved by the Engineer

during fall or winter seasons, the Contractor shall follow procedures for dormant seeding. See *Permanent Seeding and Mulching Plan* above for dormant seeding requirements. However, vegetation must be inspected and reseeded by Contractor as necessary in the following spring to ensure good vegetative cover. Acceptance of dormant seeding shall not occur until after May 1, in the following spring.

- Temporary seeding and mulch shall be inspected and maintained or repaired weekly. At a minimum, 75 percent of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (e.g., mulch, filter barriers, check dams, bales). Mulch shall be reapplied as necessary to completely cover soil.

- Areas within 75 feet of a wetland or waterbody shall be stabilized prior to any storm event with a double row of sediment barriers (Maine Construction General Permit, Appendix A (3)).

Table 14-1: Stabilization Schedule

STABILIZATION SCHEDULE		
Maximum Expected Interim Period* - (Days)	**Temporary Mulching (Hay)**	**Temporary Seeding**
0-7 (0-2)	None	None
7-30 (2-14)	2-bales/1,000 sq.ft.	None
30-60 (14-30)	2-bales/1,000 sq.ft.	(per Table 14-2: Temporary Seeding Schedule)
More than 7 days during winter season	4-bales/1,000 sq.ft.	Dormant seeding only
* Values in parentheses indicates interim period for sensitive and critical areas. ** Mulch application rates shall be doubled for winter construction.		

Table 14-2: Temporary Seeding Schedule

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

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

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

- Limit the exposed area to those areas in which work is to occur during the following 15 days and that can be mulched in one day prior to any snow event.

- Where required and approved by the Engineer, installation of silt fence may be modified from detail on design plans to substitute six inches of suitable non-organic material over the bottom of the silt fence in lieu of trenching and backfilling fabric or erosion control mix berm/barrier.
- Mulching and seeding rates shall adhere to the *Temporary Seeding and Mulching Schedule* above. *Note that all mulching rates shall be doubled as shown in the above table and shall follow the sensitive area schedule during winter construction.*
- Permanent seeding shall not be attempted by the Contractor during winter season unless otherwise approved by the Engineer.

14.5.2 Erosion Control Removal

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

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

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

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

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

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

14.6 CONCLUSION

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