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Volume II

ACRONYM AND ABBREVIATION LIST

Acronym or Abbreviation	Definition
ATV	all-terrain vehicle
BMP	Best Management Practice
CFR	Code of Federal Regulations
CMP	Central Maine Power Company
CO_2	carbon dioxide
DEP	Maine Department of Environmental Protection
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FDP	Final Development Plan
ft^2	square feet
gpd	gallons per day
gpm	gallons per minute
GPS	Global Positioning System
ISO-NE	Independent System Operator – New England
HVAC	Heating, ventilation and air conditioning
IWWH	Inland Wading Bird and Waterfowl Habitat
kV	kilovolt
kWh	kilowatt-hour
LURC	Land Use Regulation Commission
MDIFW	Maine Department of Inland Fisheries and Wildlife
MDOT	Maine Department of Transportation
Met towers	Meteorological towers
MHPC	Maine Historic Preservation Commission
MNAP	Maine Natural Areas Protection Division
MRSA	Maine Revised Statute Annotated
MW	megawatt
NO_x	nitrogen oxides
NP	Neutralization Potential
NRPA	Natural Resource Protection Act
O&M	Kibby Operations and Maintenance
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
the Project	Kibby Wind Power Project

Acronym or Abbreviation	Definition
PSS	Palustrine Scrub-Shrub Wetland
P-WL	Protected Wetland
ROW	right-of-way
SCADA	System Control and Data Acquisition
sf	square feet
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
TransCanada	TransCanada Maine Wind Development, Inc.
TRI	Title, Right and Interest
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WET	Wetland Evaluation Technique

1.0 INTRODUCTION

The Final Development Plan (FDP) for the Kibby Wind Power Project (the Project) is presented in the following sections. The FDP responds to the requirements outlined in 10.21,G,10 of the Land Use Regulation Commission's (LURC) Land Use Districts and Standards, as well as to specific requirements for the FDP that are outlined in the Rezoning and Preliminary Development Plan Approval issued on March 5, 2008 for ZP 709. A signed application form is provided in Appendix A. The details of the Project as outlined in the Preliminary Development Plan have not substantially changed; rather, additional detail and refinements have been developed for the Project, as discussed in Section 2.

The background studies provided as a part of the Preliminary Development Plan application are not repeated in the FDP, and still reflect conditions at the Project site. The FDP provides engineering design detail and additional information for the various elements of the Project, and provides a summary of applicable issues addressed as part of the Preliminary Development Plan to ensure that the most current information is considered in approval of the Project.

Note that additional engineering refinements throughout the construction process are an integral part of the Project's intended implementation. Section 2.4.1 outlines a communication and review process that will ensure LURC's appropriate oversight of potential changes to ensure that the impact envelope approved through the FDP is maintained. Detailed geotechnical information has not been collected for development of the Project final design in this FDP. Due to the Project location, the impacts associated with clearing and access to complete a meaningful geotechnical program would be substantially similar to those associated with Project clearing and access. Because TransCanada Maine Wind Development, Inc. (TransCanada) believes approval for that impact through the FDP should be issued prior to implementing such a substantial level of work, the final design reflected in this application incorporates conservative assumptions that will be refined and reduced through geotechnical and other field decisions. The Project as outlined in the FDP reduces impacts beyond those identified in the Preliminary Development Plan, and careful Project implementation will ensure that impact reduction continues to be a focus throughout the Project construction effort.

2.0 PROJECT DESCRIPTION

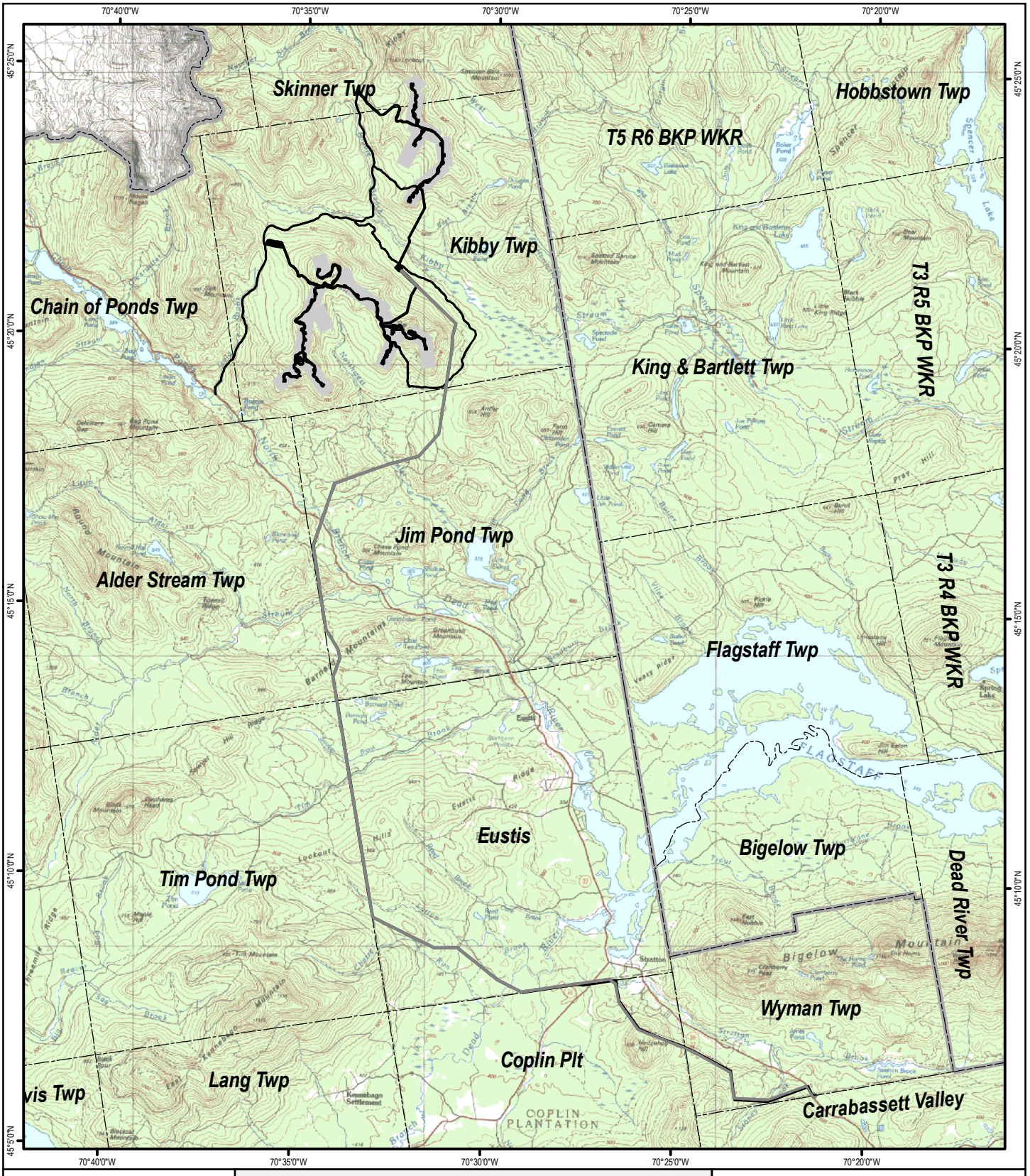
2.1 Summary of Project Characteristics

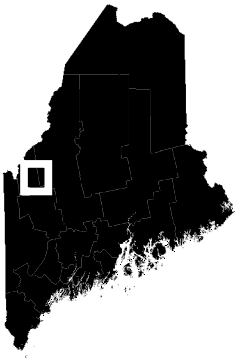
The Kibby Wind Power Project consists of 44 Vestas V90 3 megawatt (MW) wind turbines capable of generating approximately 132 MW of electricity. The turbines are located on two general ridgeline areas in the Boundary Mountains in Franklin County, Maine (Figure 2-1). The first ridgeline area is located along the southern portion of Kibby Mountain (the A Series). The second ridgeline area, the B Series, consists of wish-bone shaped ridge area along Kibby Range. Associated elements of the Project include: an existing roadway network and new access roads; a 34.5 kilovolt (kV) electrical collector system; the Kibby Substation; an Operations and Maintenance (O&M) Building (formerly called the service building); and a 27.6-mile 115 kV electric transmission line that will extend from the Kibby Substation to the Bigelow Substation located in Carrabassett Valley. Each Project element, along with an overlay of LURC zoning districts, is shown in Figures 2-2 through 2-21. Details with regard to specific Project elements can be found in the following sections:

- Road and Turbine Location and Design – Section 3;
- 34.5 kV Electrical Collector System Design – Section 4;
- Kibby Substation – Section 5;
- Kibby O&M Building – Section 6;
- 115 kV Electric Transmission Line – Section 7; and
- Temporary Construction Disturbance Areas – Section 8.

2.2 Information Update

Table 2-1 provides a summary of key Project-related facts. As can be seen from this table, the majority of Project information remains the same as presented in the Preliminary Development Plan review process, although certain impacts (for example, to wetlands) have been reduced. Table 2-2 provides a summary of the estimated acres of disturbance (both temporary and permanent) for the Project. No turbine locations have been changed, and the area of most features remains the same. Where the final design has adjusted the disturbance area, an explanation is provided in the table; details about each Project element are provided in its respective section (as noted above).





Legend

- Proposed Kibby Wind Power Project Area
- Transmission Line ROW
- Area to be Rezoned
- State Boundary
- County Boundary
- Town Boundary

Data Notes: Base map is 100k USGS Topographic Map.

2 Miles

Kibby Wind Power Project

Project Overview

Figure 2-1

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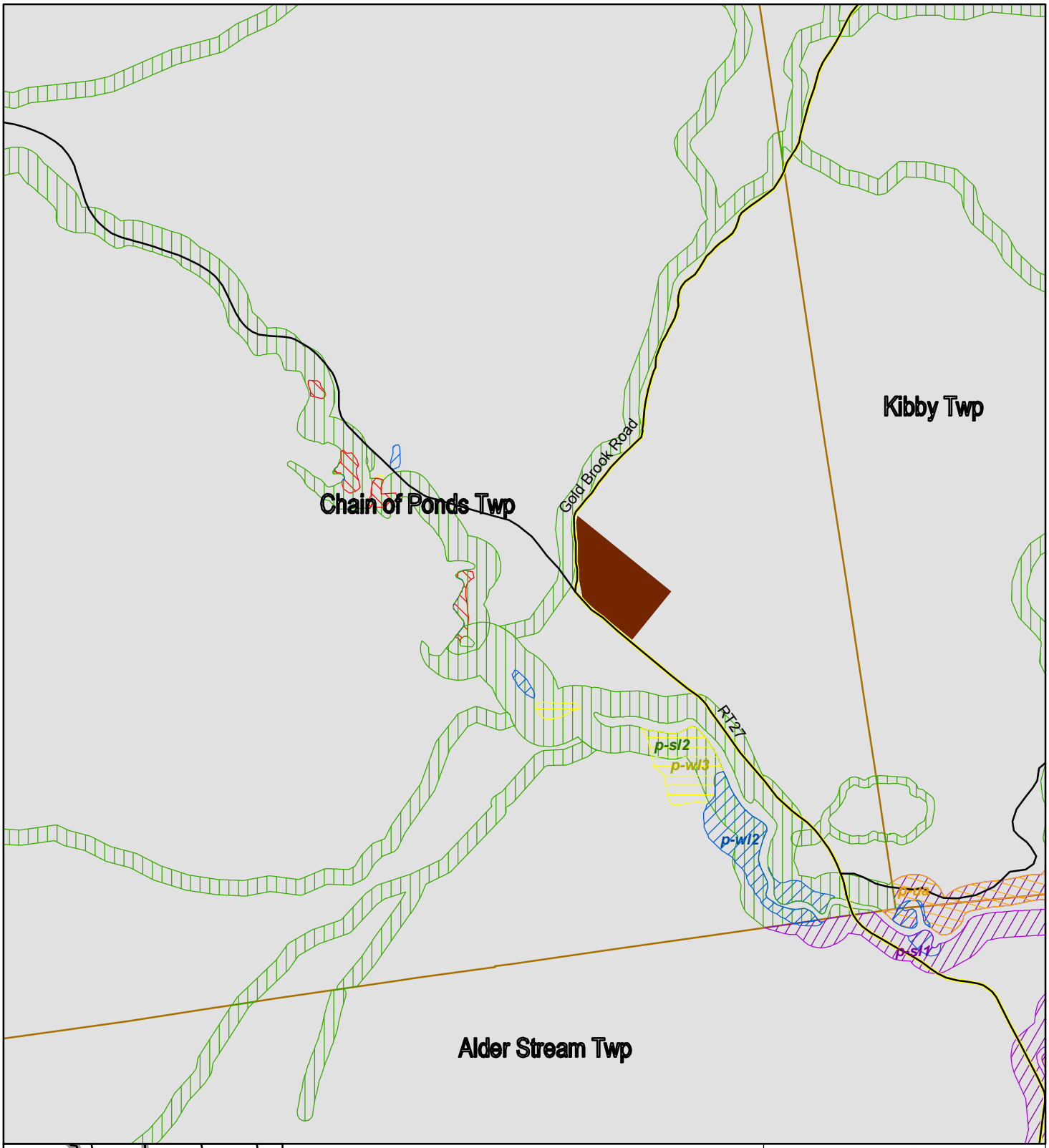

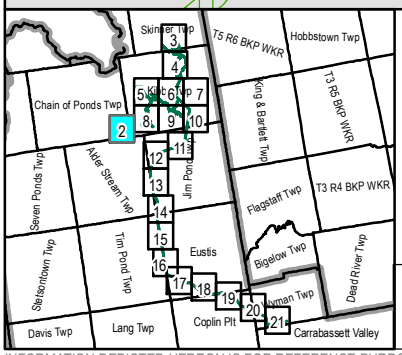

1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

X## Wetland ID
X## Stream ID

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-2

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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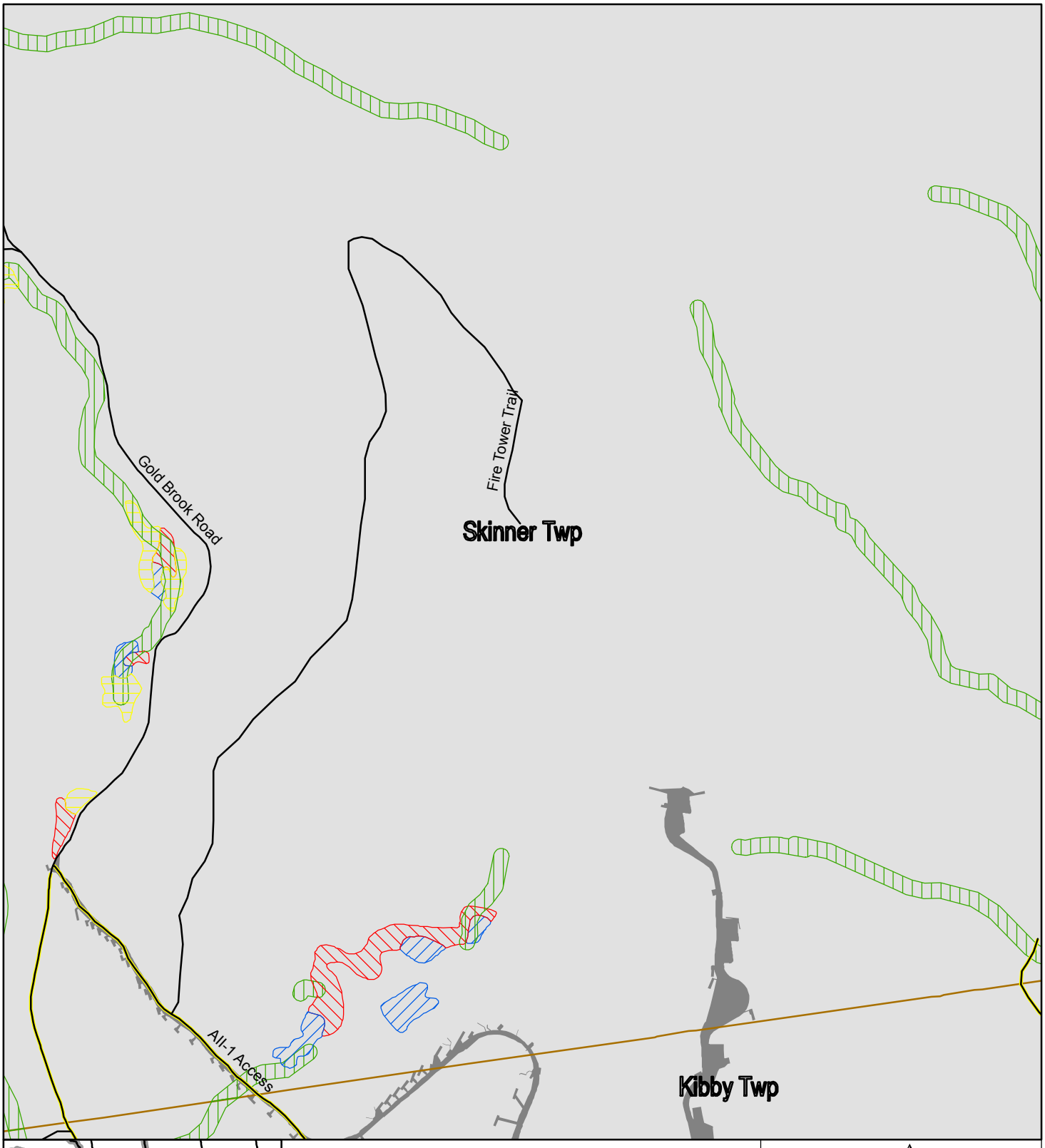

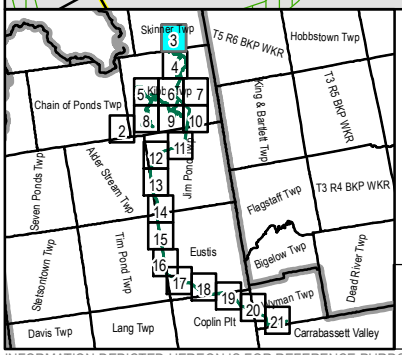

- 1/10 Mile Marker
- Surveyed Town Line
- Municipal Boundary (USGS)
- Road/Trail
- Project Access Road
- Proposed Substation
- Wetlands
- Streams
- Proposed Series A Ridge Construction Area
- Proposed Series B Ridge Construction Area
- Proposed Collector Line
- Proposed Operations and Maintenance Building
- Proposed Transmission Line ROW
- X## Wetland ID
- X## Stream ID

LURCZONE
- p-rr200
- p-wl3
- p-ua
- p-sl2
- p-wl1
- p-wl2
- p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-3

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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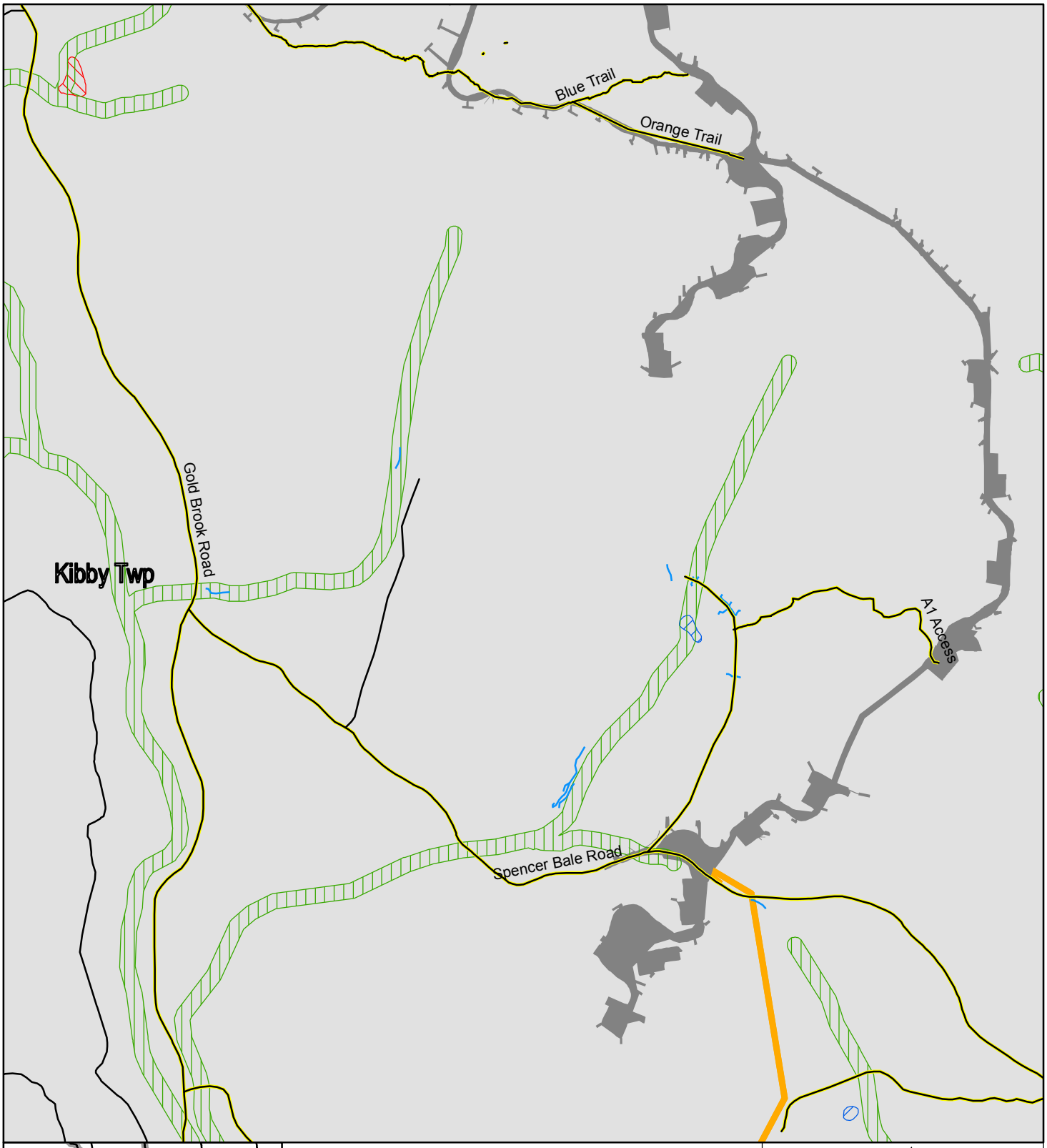

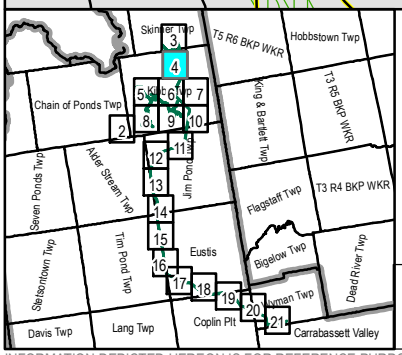

- 1/10 Mile Marker
- Surveyed Town Line
- Municipal Boundary (USGS)
- Road/Trail
- Project Access Road
- Proposed Substation
- Wetlands
- Streams
- Proposed Series A Ridge Construction Area
- Proposed Series B Ridge Construction Area
- Proposed Collector Line
- Proposed Operations and Maintenance Building
- Proposed Transmission Line ROW
- X## Wetland ID
- X## Stream ID

LURCZONE
- p-rr200
- p-wl3
- p-ua
- p-sl2
- p-wl1
- p-wl2
- p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-4

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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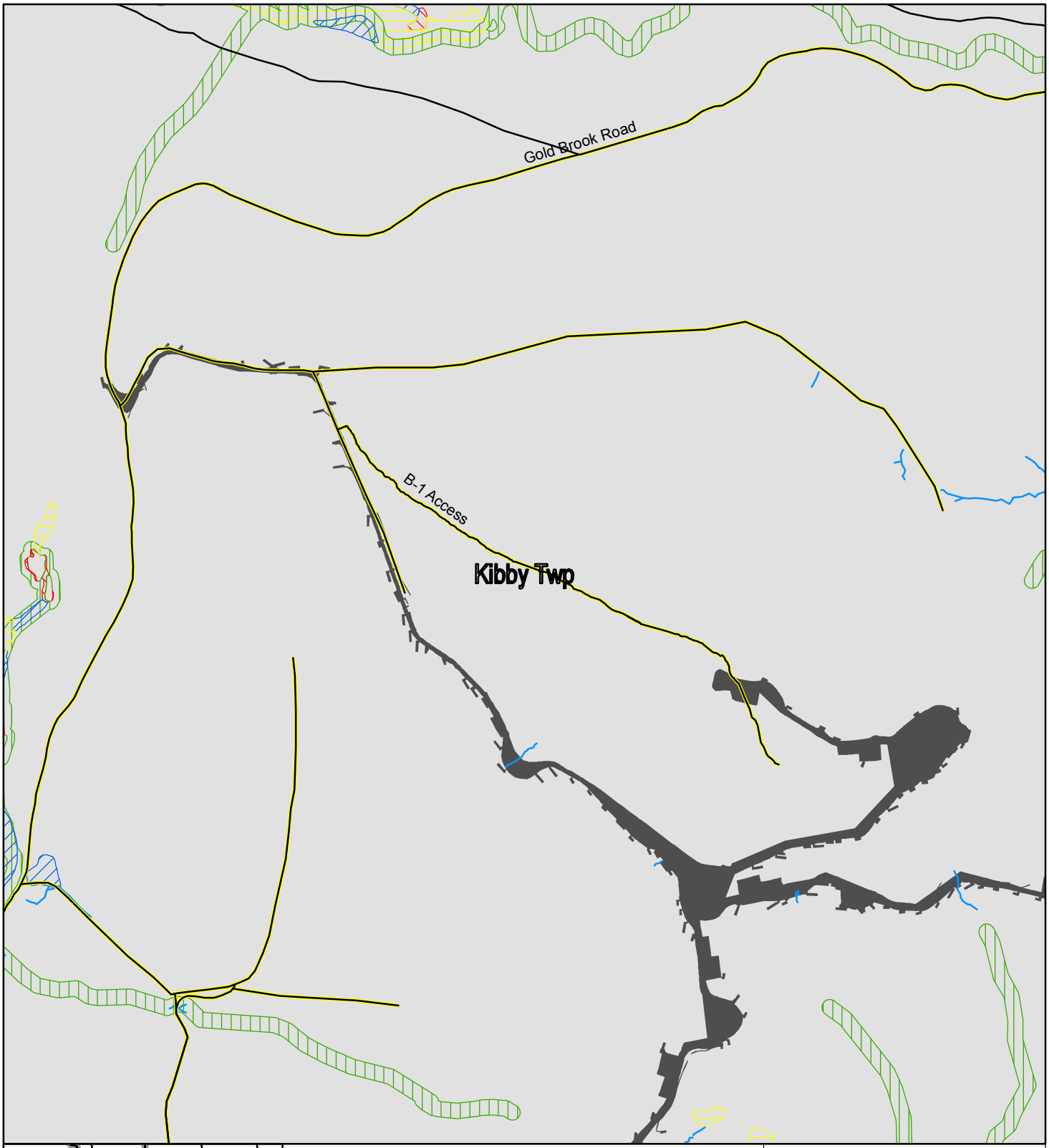

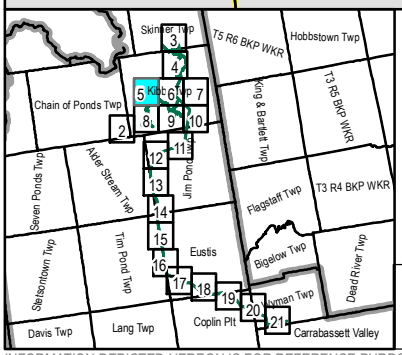

1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams
X## Wetland ID
X## Stream ID

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-5

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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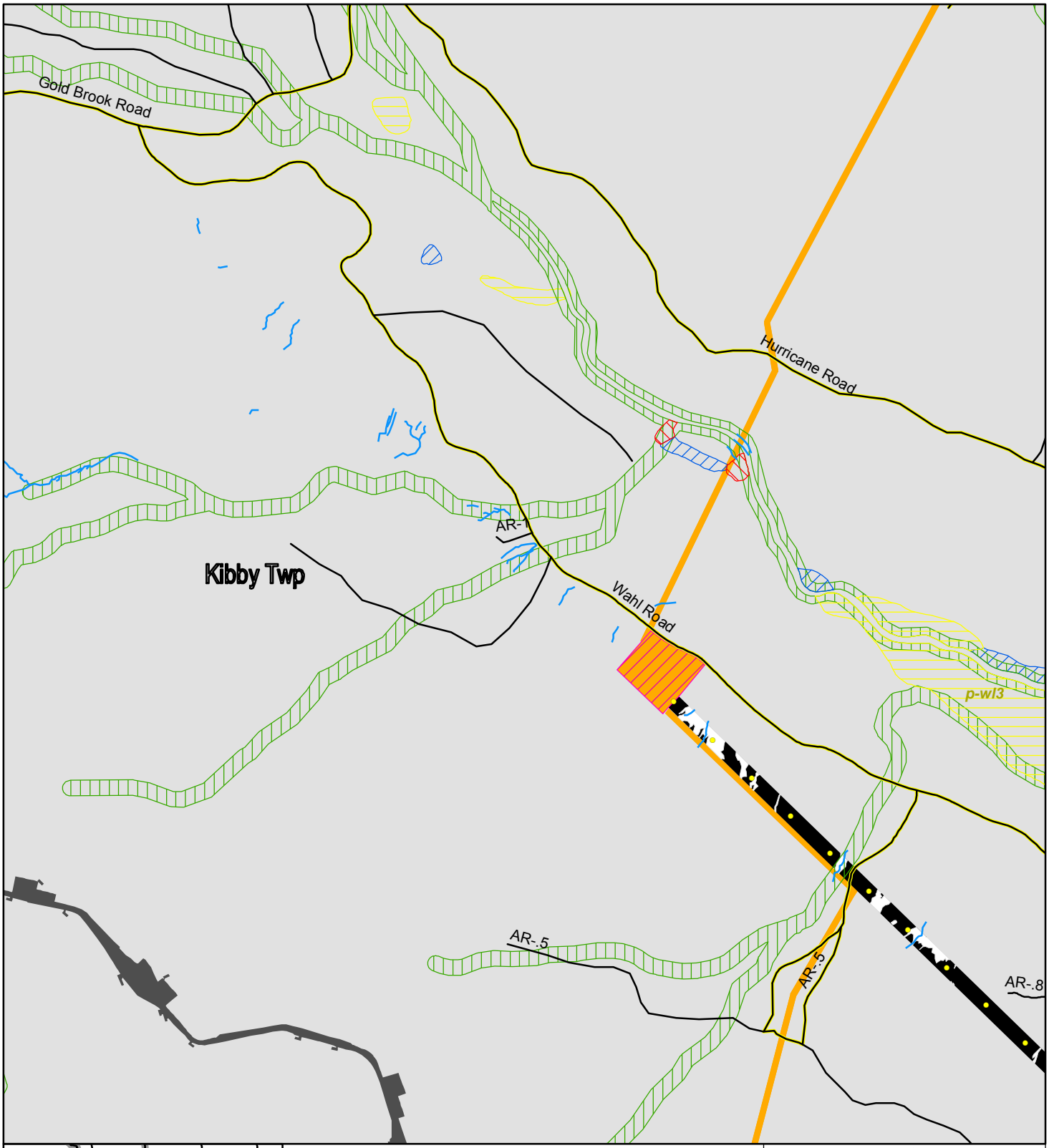

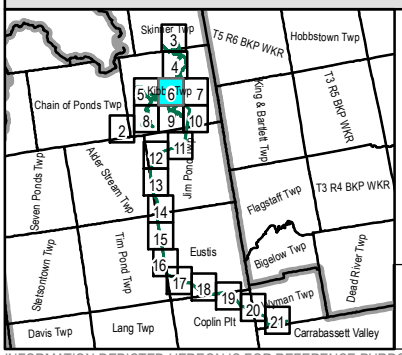

1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

X## Wetland ID
X## Stream ID

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-6

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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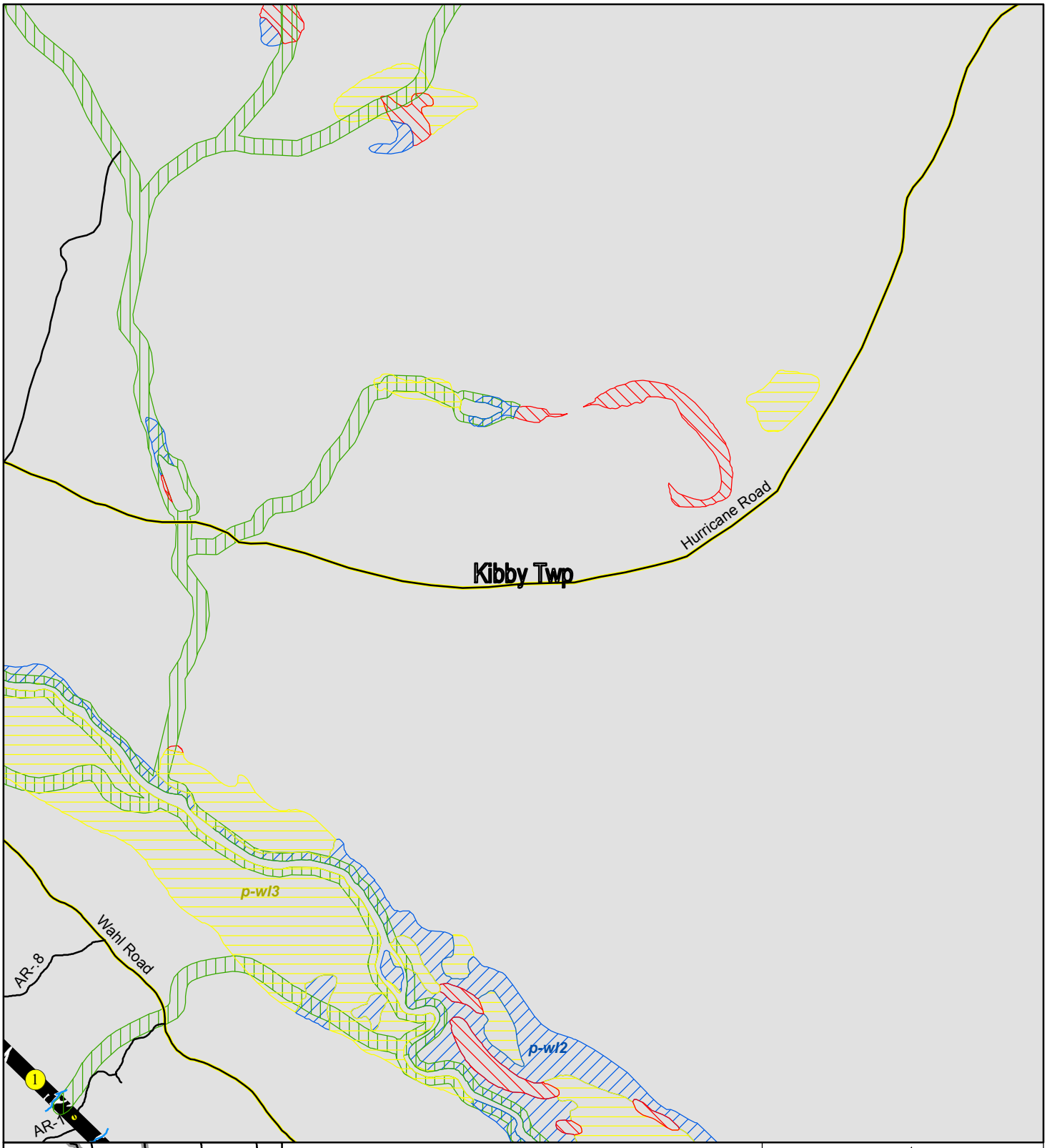

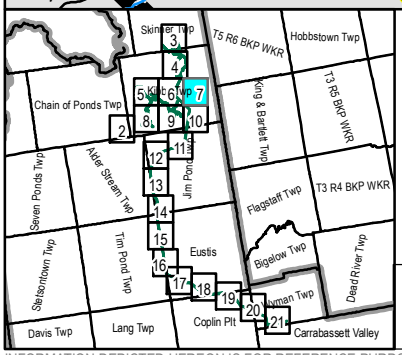

1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams
X## Wetland ID
X## Stream ID

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N
0 1,000 2,000
Feet

Figure: 2-7

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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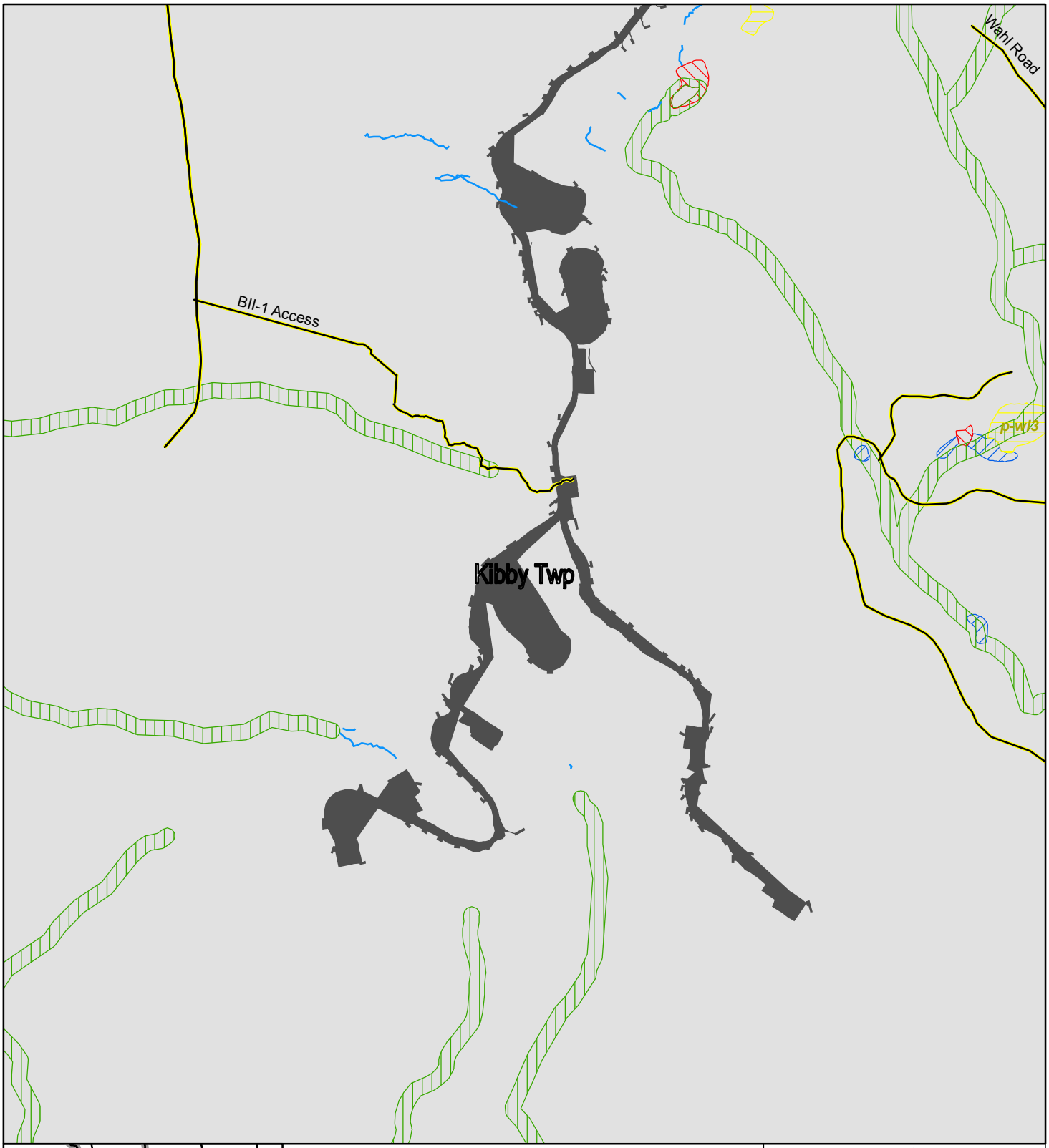

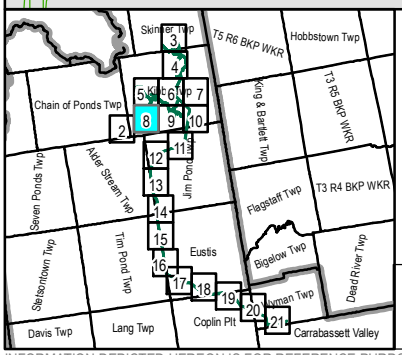

- 1/10 Mile Marker
- Surveyed Town Line
- Municipal Boundary (USGS)
- Road/Trail
- Project Access Road
- Proposed Substation
- Wetlands
- Streams
- Proposed Series A Ridge Construction Area
- Proposed Series B Ridge Construction Area
- Proposed Collector Line
- Proposed Operations and Maintenance Building
- Proposed Transmission Line ROW
- X## Wetland ID
- X## Stream ID

LURCZONE
- p-rr200
- p-wl3
- p-ua
- p-sl2
- p-wl1
- p-wl2
- p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-8

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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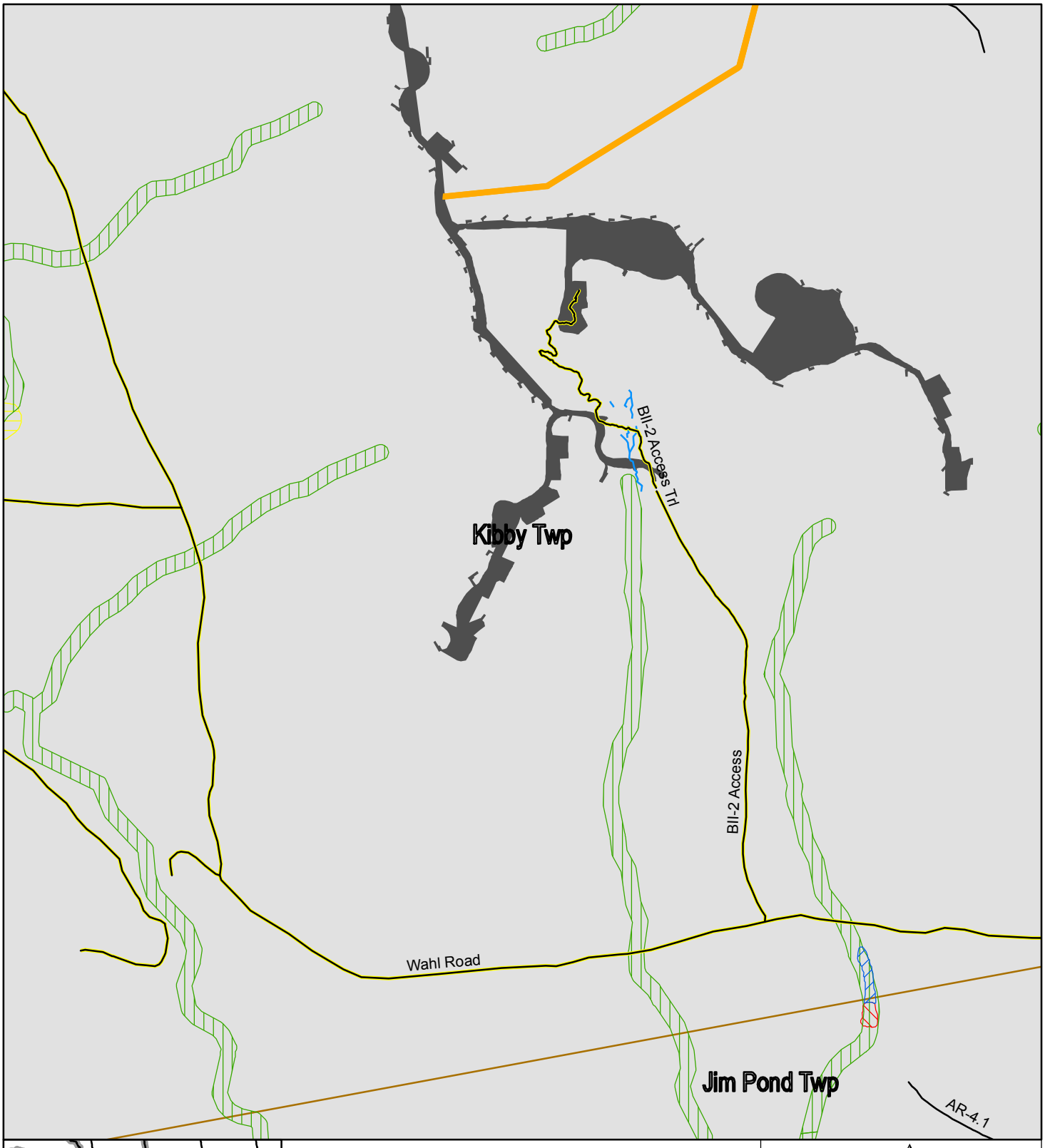

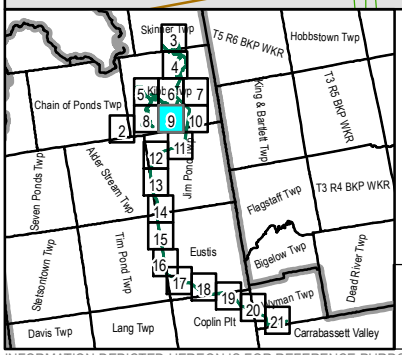

1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

X## Wetland ID
X## Stream ID

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-9

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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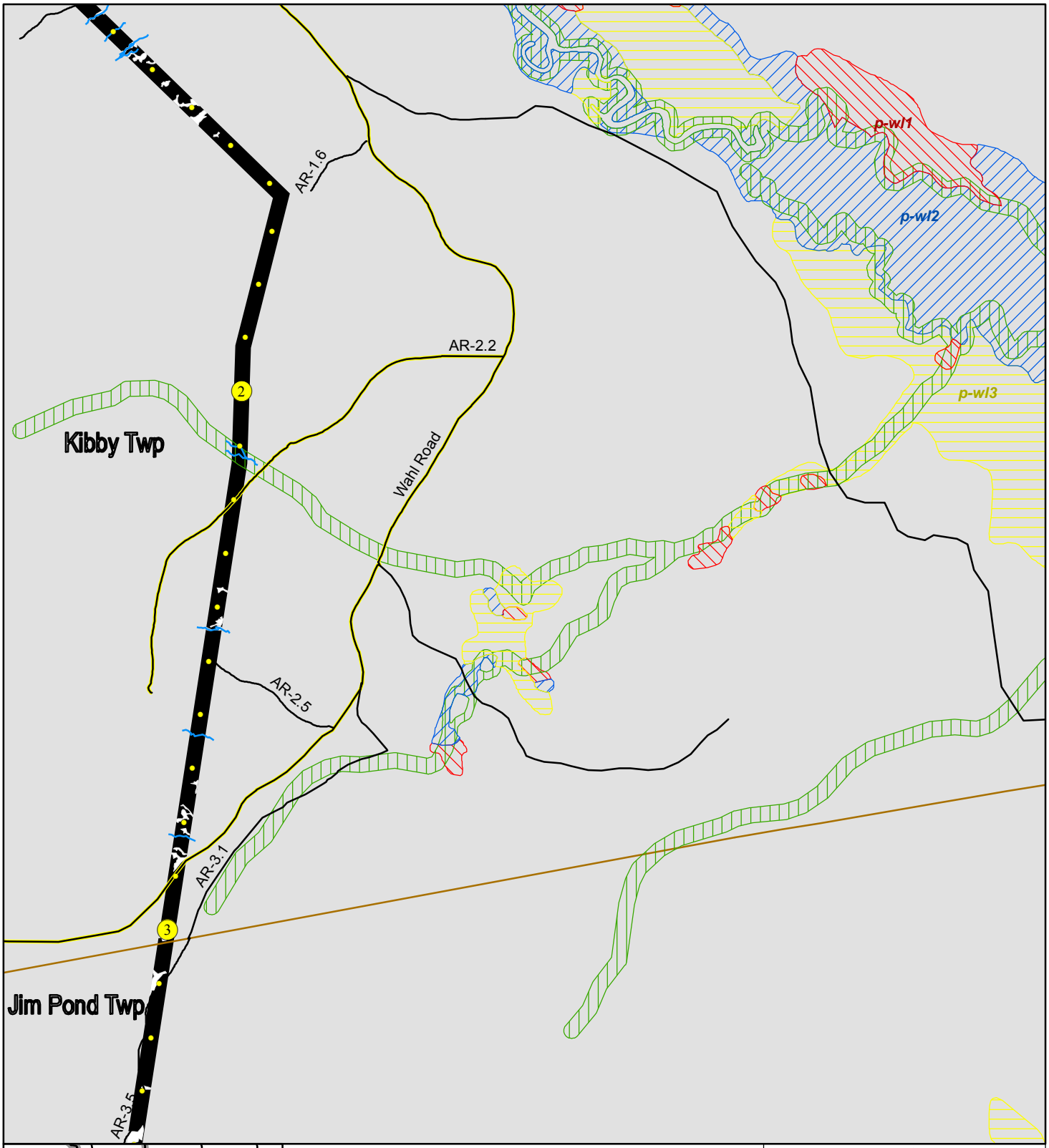

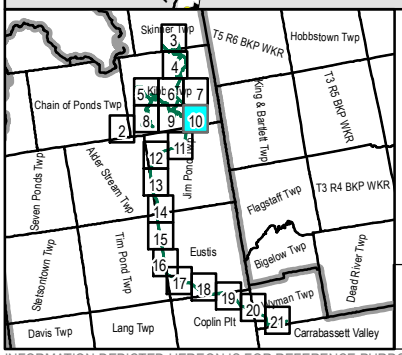

1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams
X## Wetland ID
X## Stream ID

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-10

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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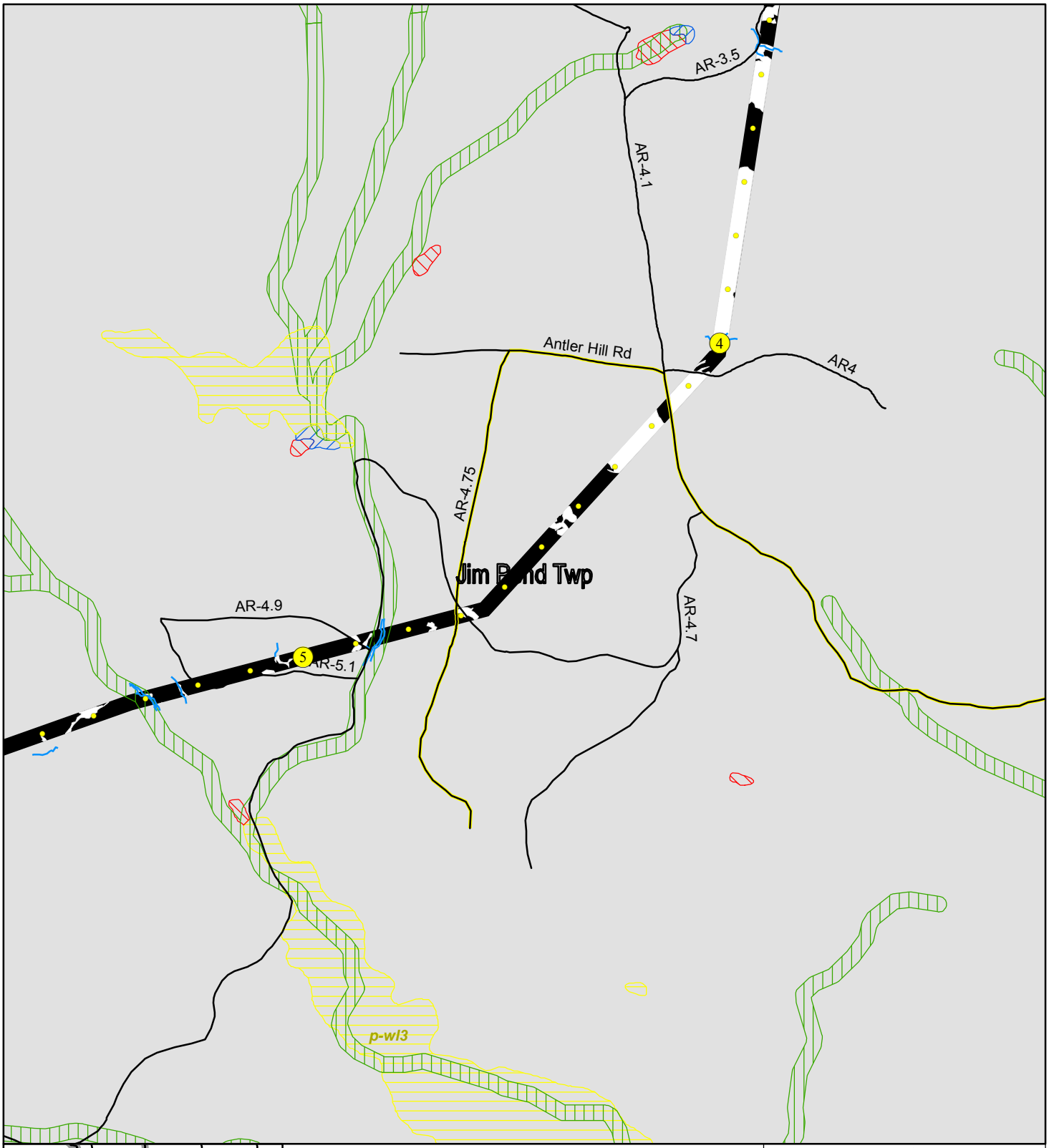

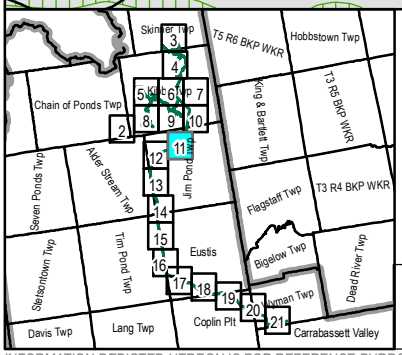

1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams
X## Wetland ID
X## Stream ID

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N
0 1,000 2,000
Feet

Figure: 2-11

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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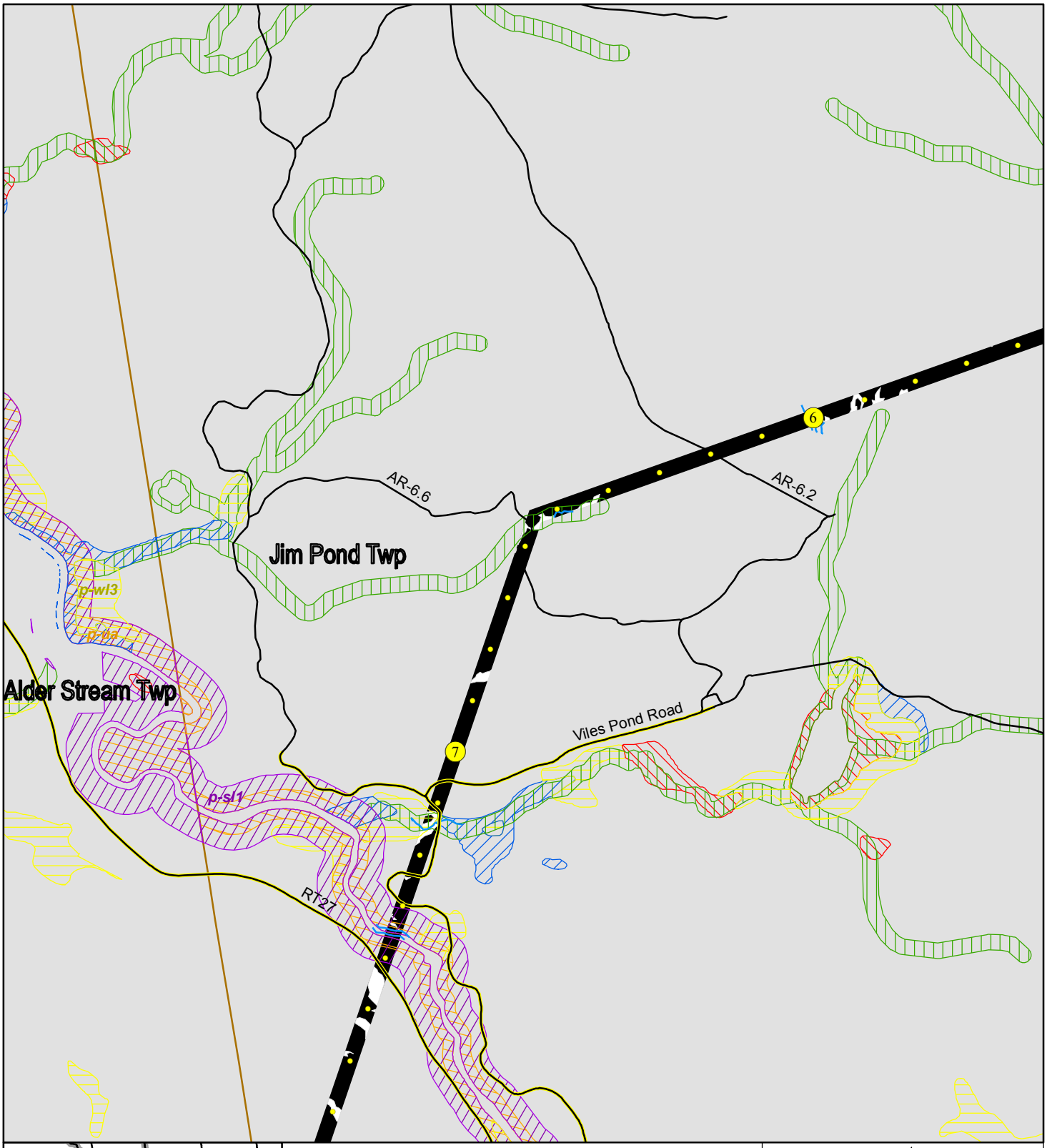

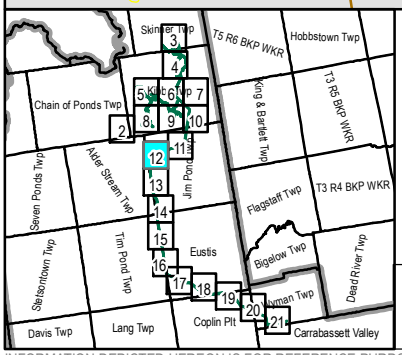

- 1/10 Mile Marker
- Surveyed Town Line
- Municipal Boundary (USGS)
- Road/Trail
- Project Access Road
- Proposed Substation
- Wetlands
- Streams
- Proposed Series A Ridge Construction Area
- Proposed Series B Ridge Construction Area
- Proposed Collector Line
- Proposed Operations and Maintenance Building
- Proposed Transmission Line ROW
- X## Wetland ID
- X## Stream ID

LURCZONE
- p-rr200
- p-wl3
- p-ua
- p-sl2
- p-wl1
- p-wl2
- p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-12

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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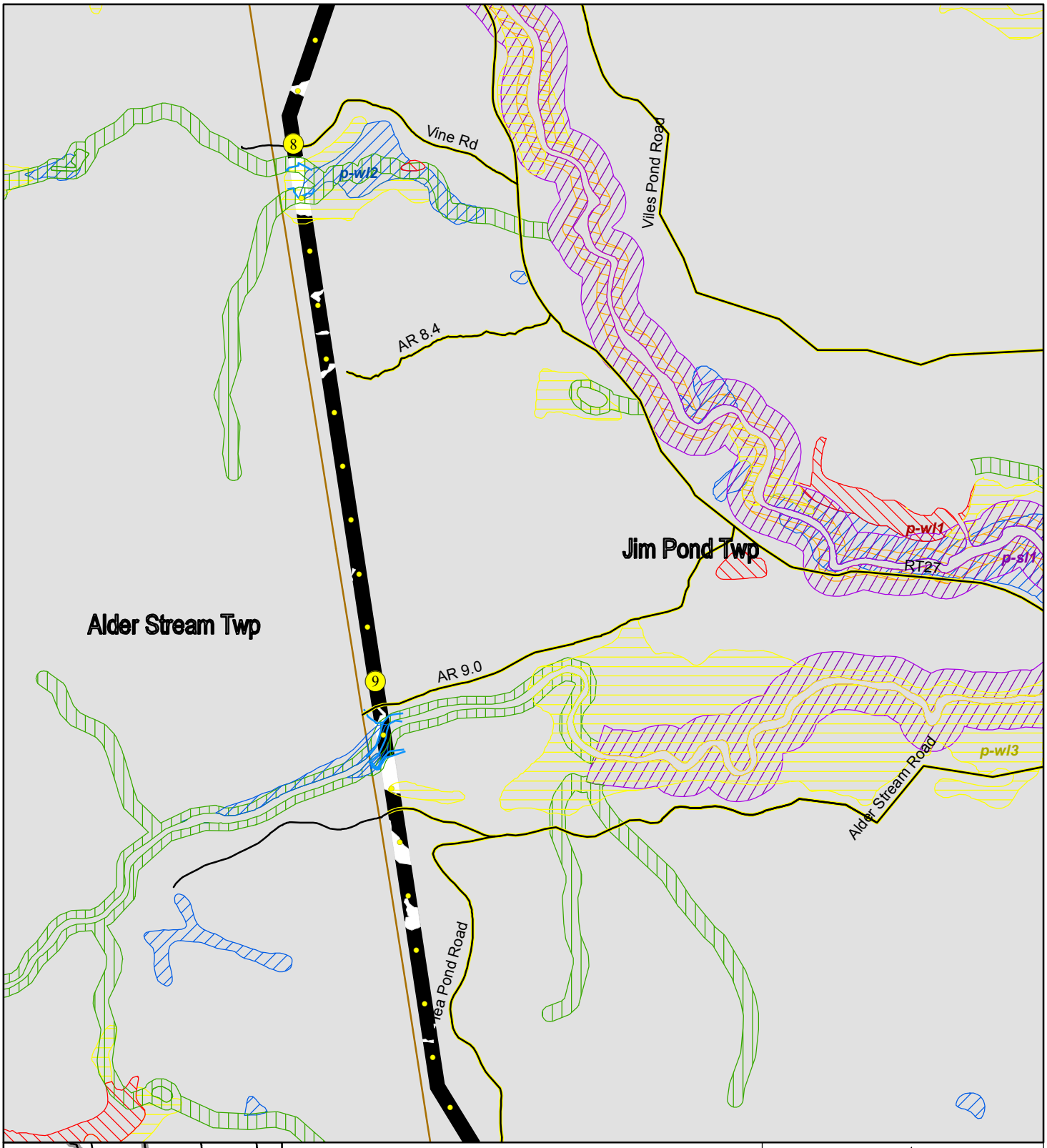

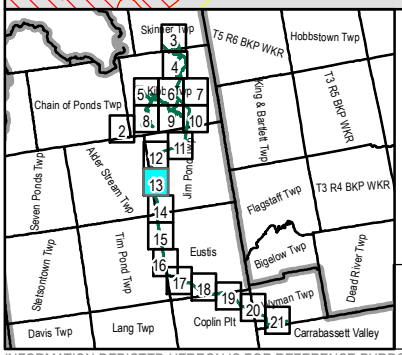

1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

X## Wetland ID
X## Stream ID

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-13

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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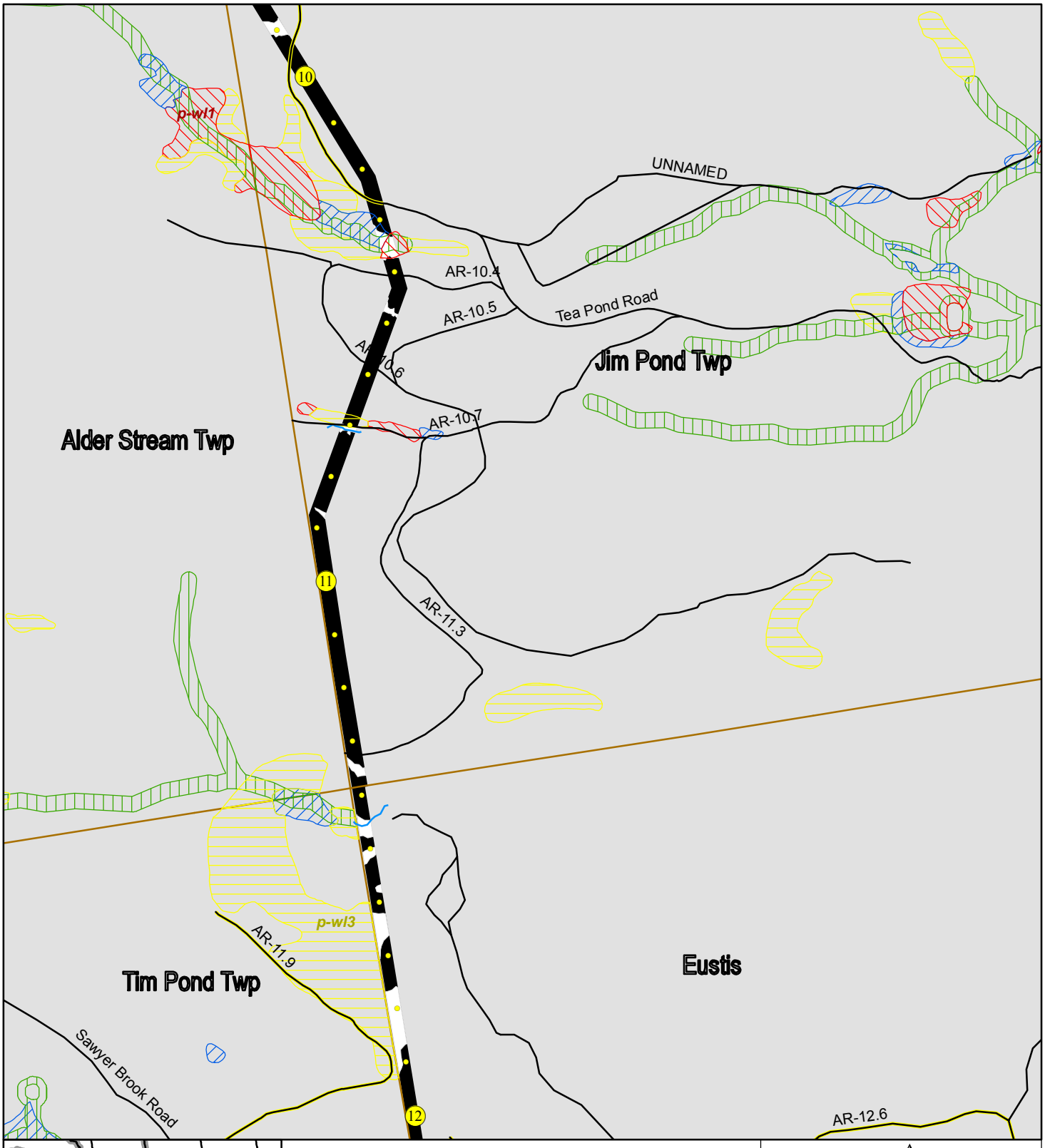
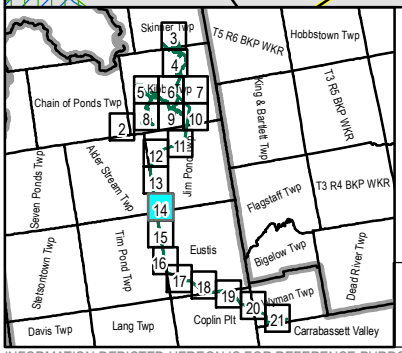




1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams
X## Wetland ID
X## Stream ID

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

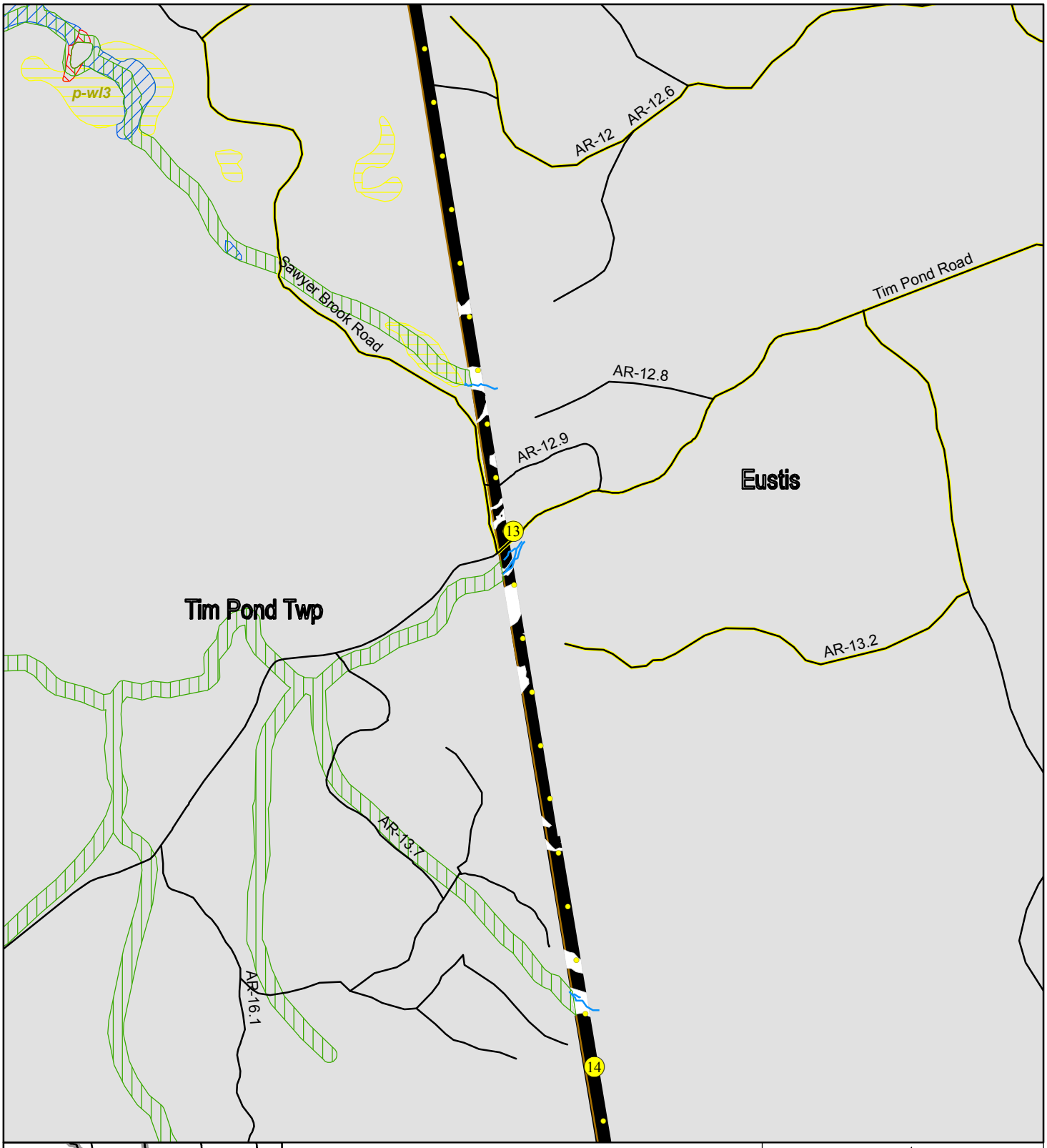
0 1,000 2,000
Feet

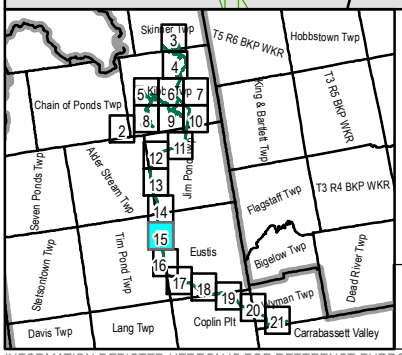
Figure: 2-14

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

S:\Projects\TRCAugusta\10654-Kibby\MXD\Figure_2_2_040408.mxd





1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams
X## Wetland ID
X## Stream ID

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-15

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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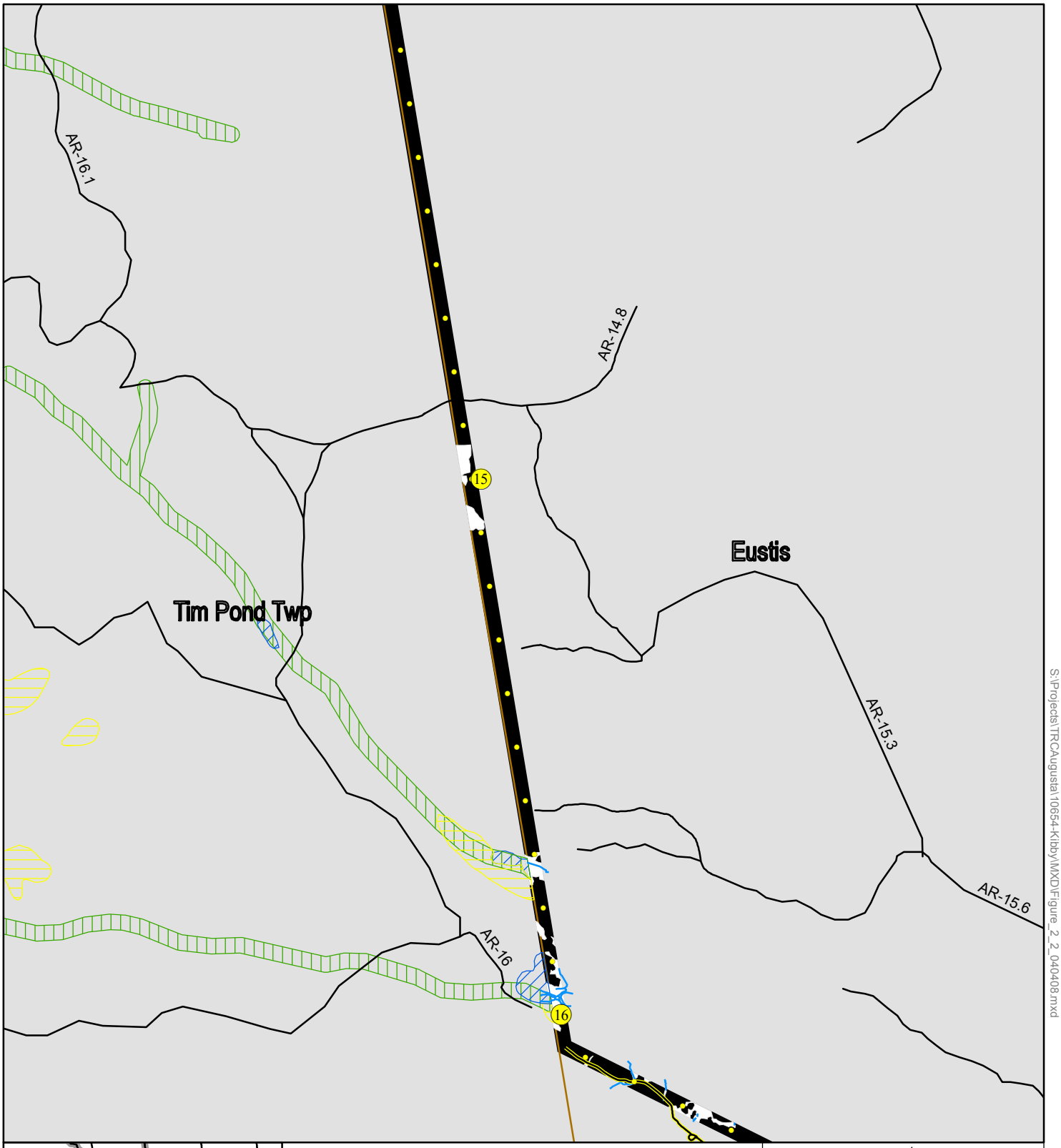

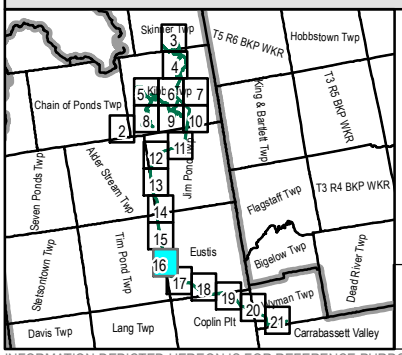

1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

X## Wetland ID
X## Stream ID

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-16

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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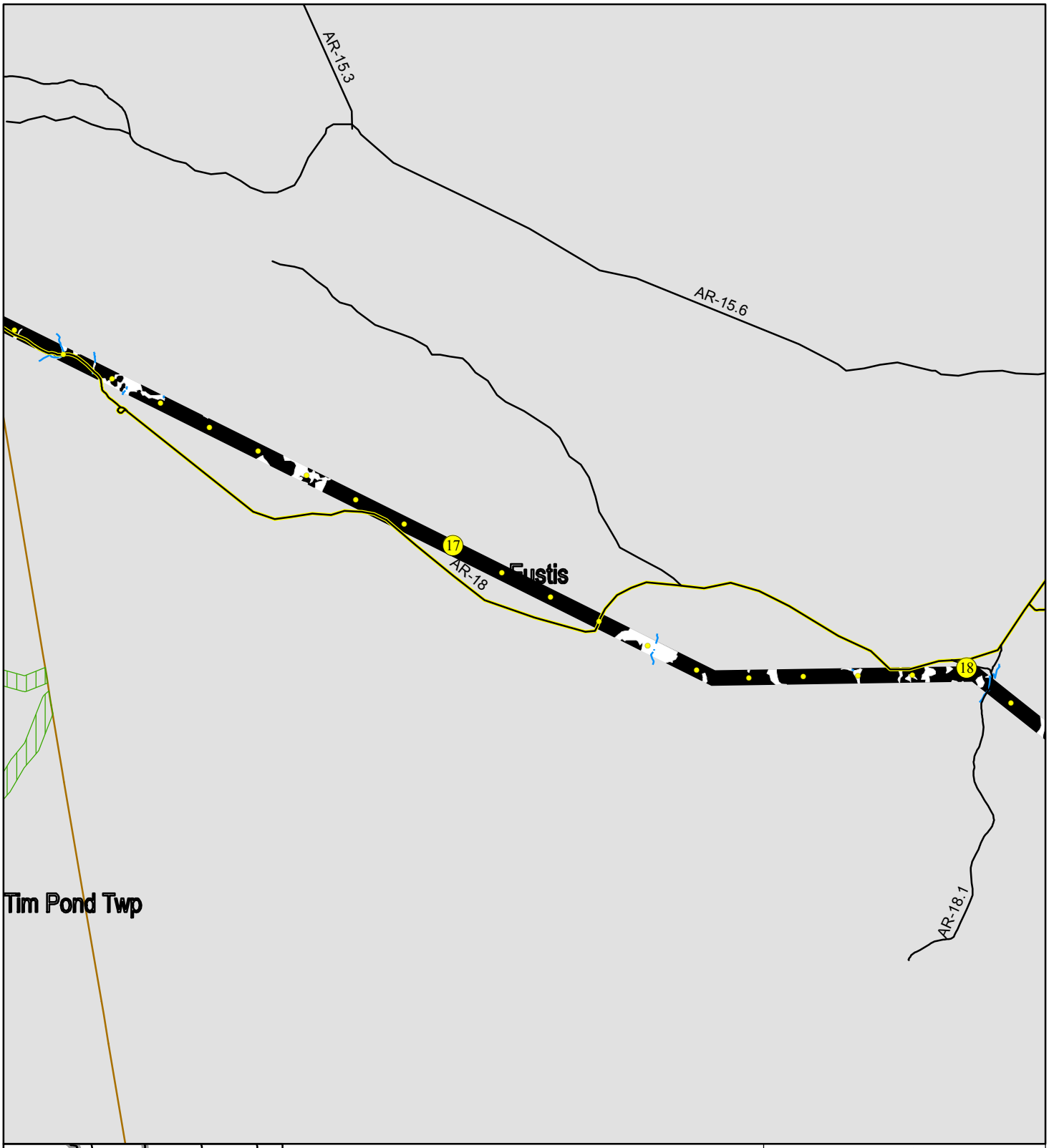

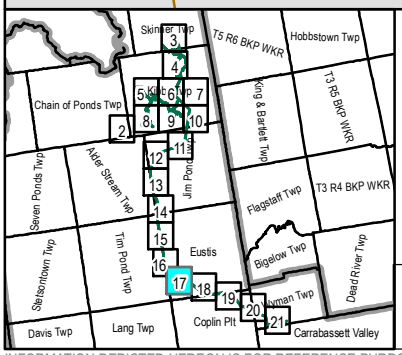

1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

X## Wetland ID
X## Stream ID

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-17

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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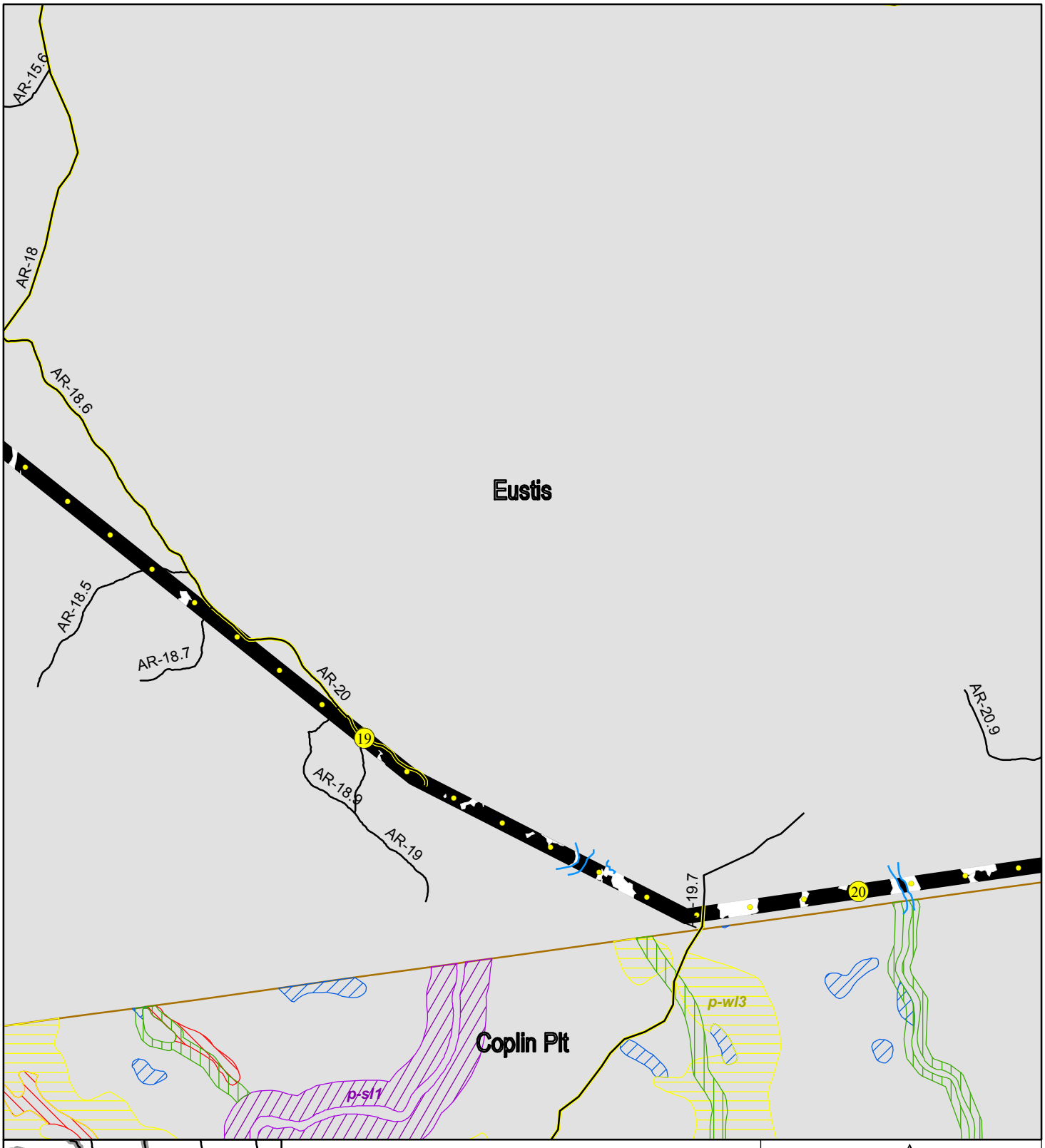

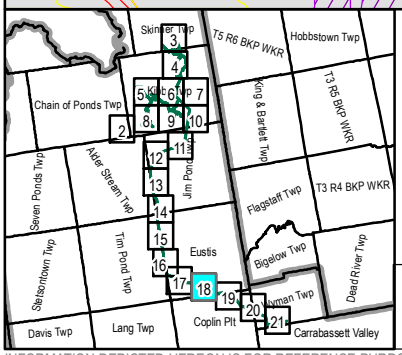

- 1/10 Mile Marker
- Surveyed Town Line
- Municipal Boundary (USGS)
- Road/Trail
- Project Access Road
- Proposed Substation
- Wetlands
- Streams

- Proposed Series A Ridge Construction Area
- Proposed Series B Ridge Construction Area
- Proposed Collector Line
- Proposed Operations and Maintenance Building
- Proposed Transmission Line ROW

X## Wetland ID X## Stream ID

LURCZONE
- p-rr200
- p-wl3
- p-ua
- p-sl2
- p-wl1
- p-wl2
- p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-18

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

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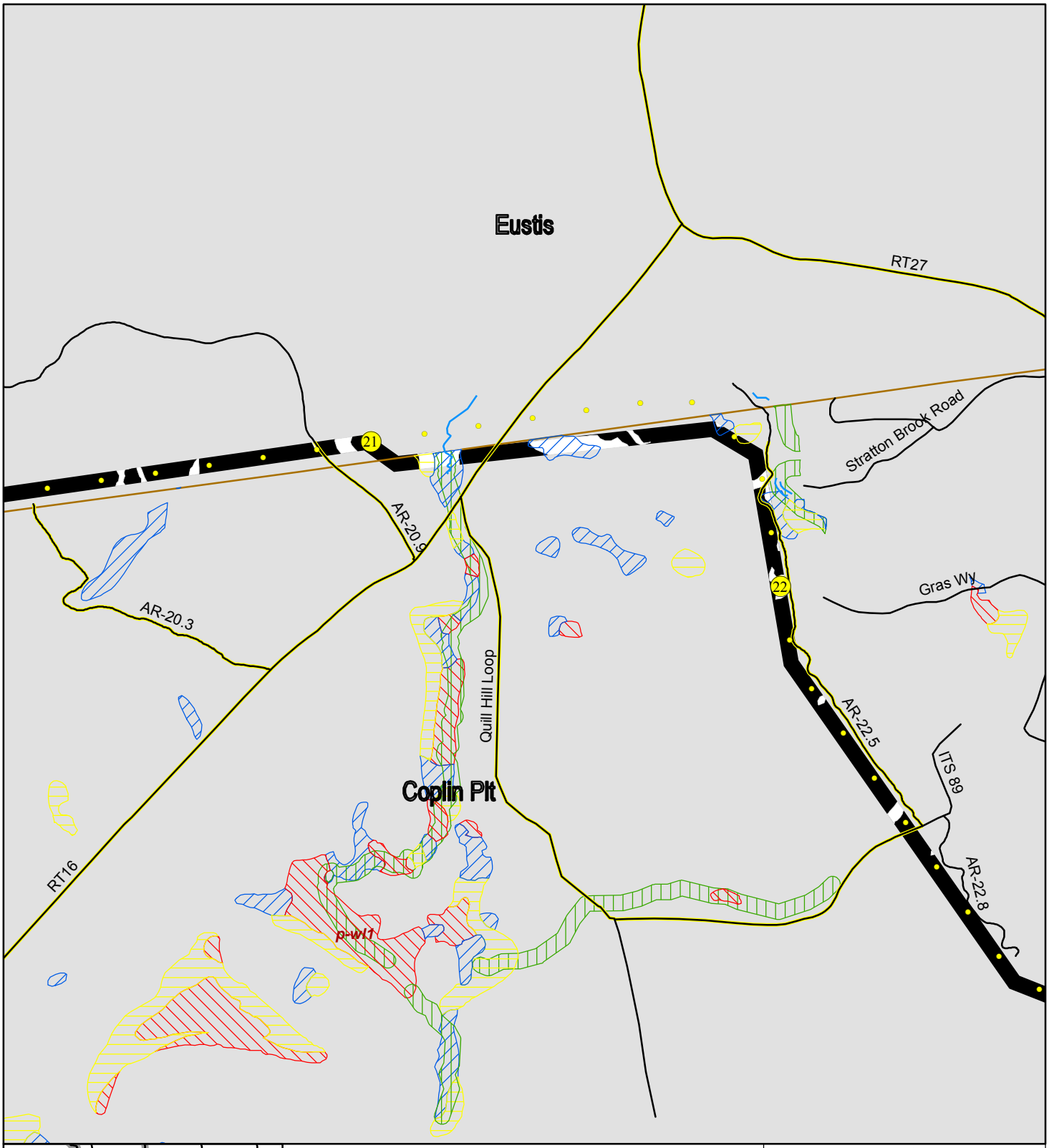
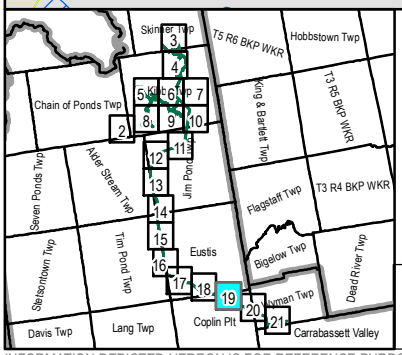




1/10 Mile Marker
Surveyed Town Line
Municipal Boundary (USGS)
Road/Trail
Project Access Road
Proposed Substation
Wetlands
Streams
X## Wetland ID
X## Stream ID

Proposed Series A Ridge Construction Area
Proposed Series B Ridge Construction Area
Proposed Collector Line
Proposed Operations and Maintenance Building
Proposed Transmission Line ROW

LURCZONE
p-rr200
p-wl3
p-ua
p-sl2
p-wl1
p-wl2
p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

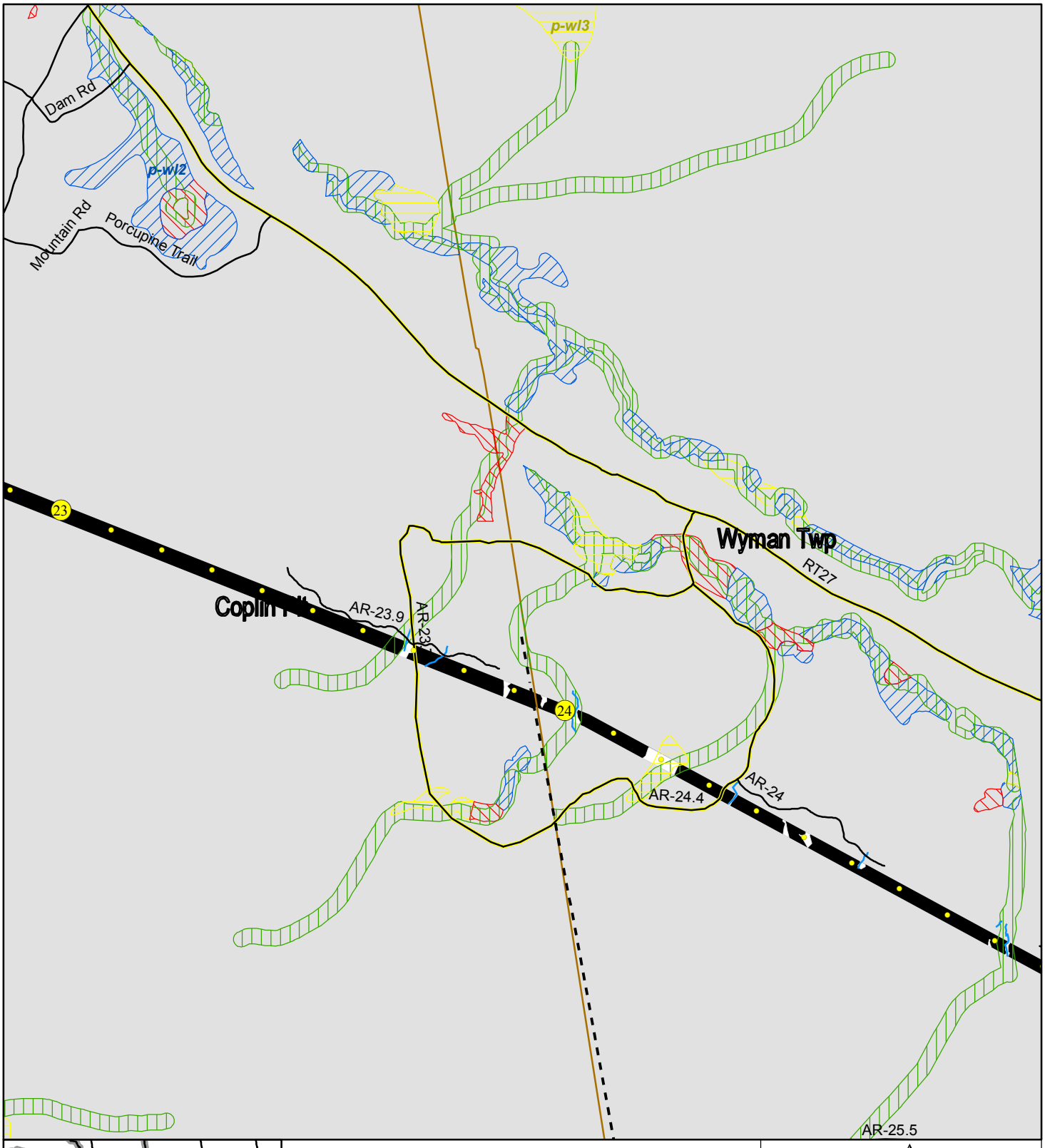
0 1,000 2,000
Feet

Figure: 2-19

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

S:\Projects\TRCAugusta\10654-Kibby\MXD\Figure_2_2_040408.mxd



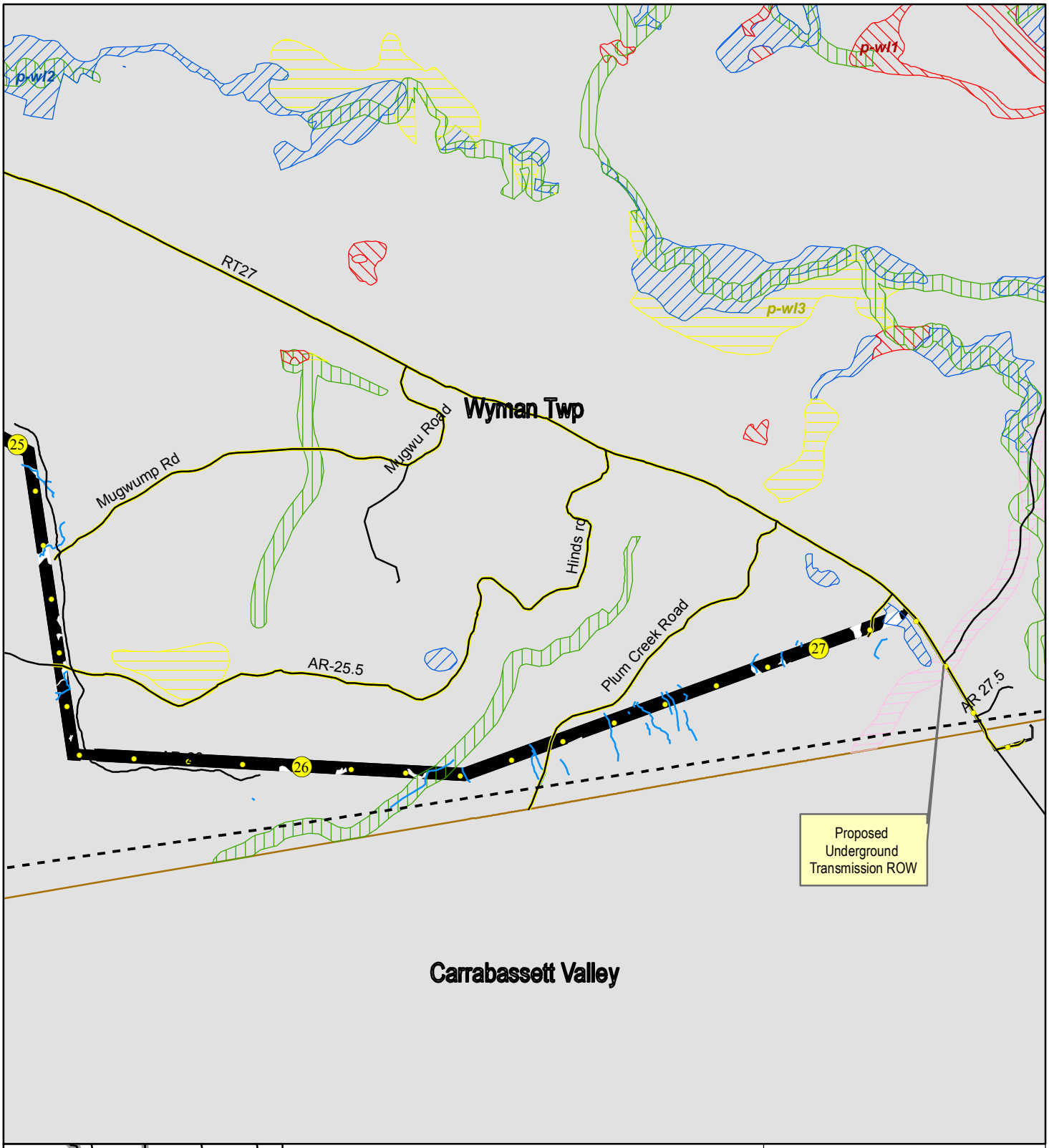
S:\Projects\TRCAugusta\10654-Kibby\MXD\Figure_2_2_040408.mxd

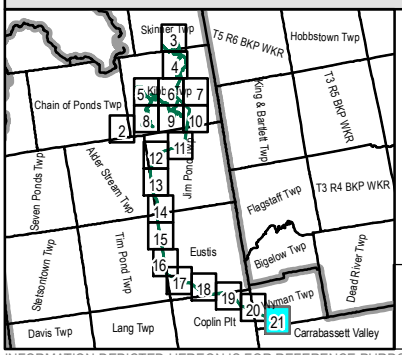
Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

Figure: 2-20

Kibby Wind Power Project

Project Location and LURC Zoning Overlay





- 1/10 Mile Marker
- Surveyed Town Line
- Municipal Boundary (USGS)
- Road/Trail
- Project Access Road
- Proposed Substation
- Wetlands
- Streams
- Proposed Series A Ridge Construction Area
- Proposed Series B Ridge Construction Area
- Proposed Collector Line
- Proposed Operations and Maintenance Building
- Proposed Transmission Line ROW
- X## Wetland ID
- X## Stream ID

LURCZONE
- p-rr200
- p-wl3
- p-ua
- p-sl2
- p-wl1
- p-wl2
- p-sl1

Notes: *Political and road data courtesy of Maine OGIS.*
LURC Zone data courtesy of Maine Land Use Regulation Commission.

N

0 1,000 2,000
Feet

Figure: 2-21

Kibby Wind Power Project

Project Location and LURC Zoning Overlay

S:\Projects\TRCAugusta\10654-Kibby\MXD\Figure_2_2_040408.mxd

Table 2-1: Kibby Wind Power Project Key Facts

Item	Preliminary Development Plan Amounts	Final Development Plan Amounts	Remarks
Number of turbines	44	44	No Change
Turbine capacity	132 MW	132 MW	No Change
Energy output per year	357 million kWh	357 million kWh	No Change
Energy output per turbine per year	8.1 million kWh	8.1 million kWh	No Change
Maine household energy equivalent per year	50,000	50,000	No Change
Pollution avoided (tons per year)	CO_2: 200,000	CO_2: 200,000	No Change
	SO_2: 350	SO_2: 350	No Change
	NO_x: 90	NO_x: 90	No Change
Cleared acreage*	434.7	423.6	Reduced Impact
Wetland fill (acres)	1.4	0.34	Reduced Impact
Miles of ridgeline	13.1	13.1	No Change
Existing roads improved (miles)	19	19	No Change
New roads (miles)	17.4	17.4	No Change

*Excluding the 115 kV transmission line corridor.
CO_2 = carbon dioxide
kWh = kilowatt-hour
NO_x = nitrogen oxides
SO_2 = sulfur dioxide

Table 2-2: Estimated Acres of Disturbance (Acres Disturbed Above 2,700 Foot Elevation)

Project Element	Preliminary Development Plan			Final Development Plan			Summary of Change
	Total	Temporary	Permanent	Total	Temporary	Permanent	
Series A and B turbines and roads	319.7 (218.4)	274 (189)	45.7 (29.4)	281 (196.6)	201 (136.8)	80 (59.8)	Final development design has reduced the overall disturbance area. Increases in permanent area result from more detailed design and reclassification between temporary/permanent. About 10% of the total permanent area is associated with turbine pads. Another 40% considers collector line clearing that will be revegetated (but not with large tree growth). The remainder is associated with roadway and associated stormwater management features and will also include revegetated areas following construction.
Series B ridge construction egress road B-2 (for one-way construction access)	1	0	1	1	0	1	No change.
Gold Brook Road improvement activities	15	0	15	15	0	15	No change.
Gold Brook Road pull-off areas	2	2	0	2	2	0	No change.
Wahl Road improvement activities	10	0	10	10	0	10	No change.
Spencer Bale Road improvement activities	3	0	3	3	0	3	No change.
Rock crusher and temporary material storage areas	29	29	0	29	29	0	No change.
Series A and B temporary laydown areas	18	18	0	18	18	0	No change.

Project Element	Preliminary Development Plan			Final Development Plan			Summary of Change
	Total	Temporary	Permanent	Total	Temporary	Permanent	
Potential concrete batch plant and material handling storage area	3	3	0	3	3	0	No change.
Disposal area	--	--	--	20.6	20.6	0	Final design has incorporated potential locations for use in storing unsuitable soil and rock material. These areas, if used, will be stabilized and revegetated.
Construction control center and parking area	1	1	0	1	1	0	No change.
Collector system corridor	29	19	10	28 (0.8)	19 (0.5)	9 (0.3)	Final development design slightly reduced the overall disturbance area, but acknowledged that a very small portion of the "overland" portion of this line begins in higher elevation areas. Permanent disturbance reflects a 20-foot wide maintained right-of-way.
Kibby Substation	3	0	3	3	0	3	No change. Note that the structure itself has reduced in size.
O&M Building area	1	0	1	1	0	1	No change. Note that the structure itself has reduced in size.
Met towers	0	0	0	8 (6)	0	8 (6)	The four permanent met towers are assumed to be located with three above 2,700 feet and one at lower elevations.
Estimated total (excluding transmission line)	***434.7 (218.4)***	***346 (189)***	***88.7 (29.4)***	***423.6 (203.4)***	***293.6 (137.3)***	**130 (66.1)**	Note that over half of the area presumed to be "permanent" above 2,700 feet will be revegetated but not to its pre-construction condition.
115 kV transmission line within LURC jurisdiction	290.25	0	290.25	310	0	310	The additional right-of-way is associated with the small shift from Eustis to Coplin Plantation. Note that the right-of-way is presumed to be a permanent change; although it will be vegetated, it will not be allowed to revert to its pre-construction condition.

Wind resource data continues to be collected at the site, and continues to confirm the viability of the Project at this location. Wind resource monitoring will continue throughout the construction effort, and permanent meteorological towers (met towers) will be installed, as discussed in Section 3.5.

Title, right and interest (TRI) for the Project is summarized in Appendix B. The Project has appropriate agreements with landowners for all permanent and temporary elements of the proposed work.

A final System Impact Study has been issued for the Project, and a letter from ISO-New England dated December 21, 2007 (provided in Appendix C) confirms that the Project will not have a significant adverse affect on the stability, reliability or operating characteristics of the Central Maine Power Company's (CMP) transmission facility or the electrical grid.

A summary of key adjustments that have been made in the FDP, as well as an updated status of other Project permits and approvals is provided below.

2.2.1 Road and Turbine Location and Design

Turbine locations remain the same as in the Preliminary Development Plan application. Road and turbine clearing locations also generally remain the same, with minor adjustments to:

- Avoid and minimize impacts to wetlands;
- Reduce the cut/fill required to construction the access road while maintaining appropriate widths, turning radii and grades; and
- Utilize shallow grade approaches to the turbine pad locations.

These layout optimizations (ranging from a slight rotation of the turbine pad to an access drive approach from a different direction) have resulted in minors shifts at the following turbine pad locations:

- Series A: A-8, A-9, A-10, A-12, A-13, A-14, A-15, A-16, A-17, A-18, and A-19
- Series B: B-1, B-2, B-3, B-5, B-7, B-8, B-11, B-12, B-13, B-14, and B-25

Design measures remain generally the same as those outlined in the Preliminary Development Plan application, with some additional measures and refinements added based on further consultation with the Maine State Soil Scientist. Total wetland fill has been significantly reduced for the Project, as discussed in detail in Section 11.

2.2.2 34.5 kV Electrical Collector System Design

The electrical collector system layout has been optimized on the ridgeline. As a result, some additional disturbance results along the ridgelines where the collector line no longer precisely

follows the ridgeline roadways' curves due to geometric considerations. Where the collector lines extend down the mountains to the Kibby Substation, the route has remained the same as reflected in the Preliminary Development Plan.

2.2.3 Kibby Substation

Minor modifications to the substation have included:

- A reduction in substation fenced area from 215 feet by 415 feet to 110 feet by 220 feet; and
- A reduction in the size of the substation control building from 50 by 65 feet to 24 by 70 feet.

The work area for the Kibby Substation has remained the same as represented in the Preliminary Development Plan.

2.2.4 Kibby O&M Building

The O&M Building is co-located with the Construction Control Center (the construction buildings may become the permanent operational support buildings) at the corner of Route 27 and Gold Brook Road. Minor dimensional adjustments to the building have been made; other characteristics of the O&M Building are generally unchanged.

2.2.5 115 kV Transmission Line

The 115 kV transmission line route and characteristics have largely remained unchanged since the review of the Preliminary Development Plan. One small segment of the transmission line has shifted from Eustis to Coplin Plantation, resulting in a slight adjustment in the amount of transmission line within LURC jurisdiction. The current distance of the 26.7-mile 115 kV transmission line within LURC jurisdiction totals approximately 17.8 miles (approximately 3.0 miles in Kibby Township; 8.4 miles in Jim Pond Township; 2.9 miles in Coplin Plantation; and 3.5 miles in Wyman Township). The balance of the transmission line is located within Maine Department of Environmental Protection (DEP) jurisdiction (towns of Eustis and Carrabassett Valley).

2.2.6 Temporary Work Areas

Temporary work areas continue to be identified that represent a conservative view of anticipated construction requirements. Therefore, additional areas have been identified below 2,700 feet elevation that would be used for storage of excess materials, if necessary. Other temporary work areas remain generally unchanged from those presented in the Preliminary Development Plan review. As phases of the construction effort are implemented, such areas may not require use and/or may require minor adjustments that would be communicated to LURC as outlined in Section 2.4.1.

2.2.7 Status of Other Permits and Approvals

The status of other permit and approvals required for the project is as follows:

- The United States Army Corps of Engineers (USACE), with jurisdiction over any proposed placement of fill in waters and wetlands of the United States, has received an individual permit application and issued public notice on March 18, 2008, with the public comment period ending April 18, 2008 and the interagency comment period ending May 2, 2008.

- Consultation with the United States Fish and Wildlife Service (USFWS) has been ongoing throughout Project development, although no specific permit is required. USFWS has been involved in determination of appropriate post-construction monitoring efforts for avian and bats, and has reviewed other species issues in the Project vicinity. The USFWS is a reviewing agency in the USACE permit process.

- The United States Environmental Protection Agency (USEPA) is not required to issue any specific permit for the Project, but is participating as a review agency in the USACE permit process.

- The Federal Aviation Administration (FAA) issues notices to determine whether structures are a hazard to navigation and to specify lighting and marking safety requirements. An initial filing was made to the FAA on November 15, 2006, and a determination was received on February 19, 2007 that the turbines would not be a hazard to navigation. The filing reflected 47 potential turbine locations as an initial layout, and synchronized red lights were required on 7 of the 19 turbines presented for Series A and for 18 of the 28 turbines presented for Series B. An updated filing with the FAA was submitted on March 13, 2008, adjusting the number and location of turbines to reflect the 44 turbines ultimately approved in the Preliminary Development Plan (Appendix D). The application has been accepted for review, and is expected to result in a similar configuration of lighting requirements. Once the revised approval has been received, it will be forwarded to LURC.

- The DEP has jurisdiction over the segments of the 115 kV transmission line that extend through Eustis and Carrabassett Valley, the two incorporated towns within which Project work is proposed. DEP issued approval of the 115 kV transmission line in those communities on October 12, 2007. Minor reduction of jurisdictional area will be addressed through a modification to the existing permit.

- In accordance with 35-A Maine Revised Statute Annotated (MRSA) §2503 and Chapter 210 of the Maine Department of Transportation (MDOT) regulations, TransCanada is seeking the necessary approvals from the MDOT for work associated with the 115 kV transmission line that is located within the Route 27 right-of-way. As provided in 35-A

MRSA §2503(20), approval from MDOT pursuant to Chapter 25 is the exclusive method for obtaining the necessary rights to locate a facility within the public right-of-way.

- The Carrabassett Valley Planning Board approved the portion of the Project located within that town during its February 28, 2008 meeting.

- TransCanada is seeking local approval for the portion of the 115 kV transmission line that is located within the town of Eustis. The Eustis Planning Board is expected to hear TransCanada's application during its May meeting.

2.3 Construction Schedule

2.3.1 Anticipated Construction Timing

Project construction is anticipated to begin during the summer of 2008 with multiple work crews, and continue as outlined in Figure 2-22. The construction process is anticipated to be implemented in phases, focusing first on Series A turbines, then on Series B turbines, in order to allow phased turbine operation as soon as possible. It is expected that both Series A and B will be in full operation by the fall of 2010.

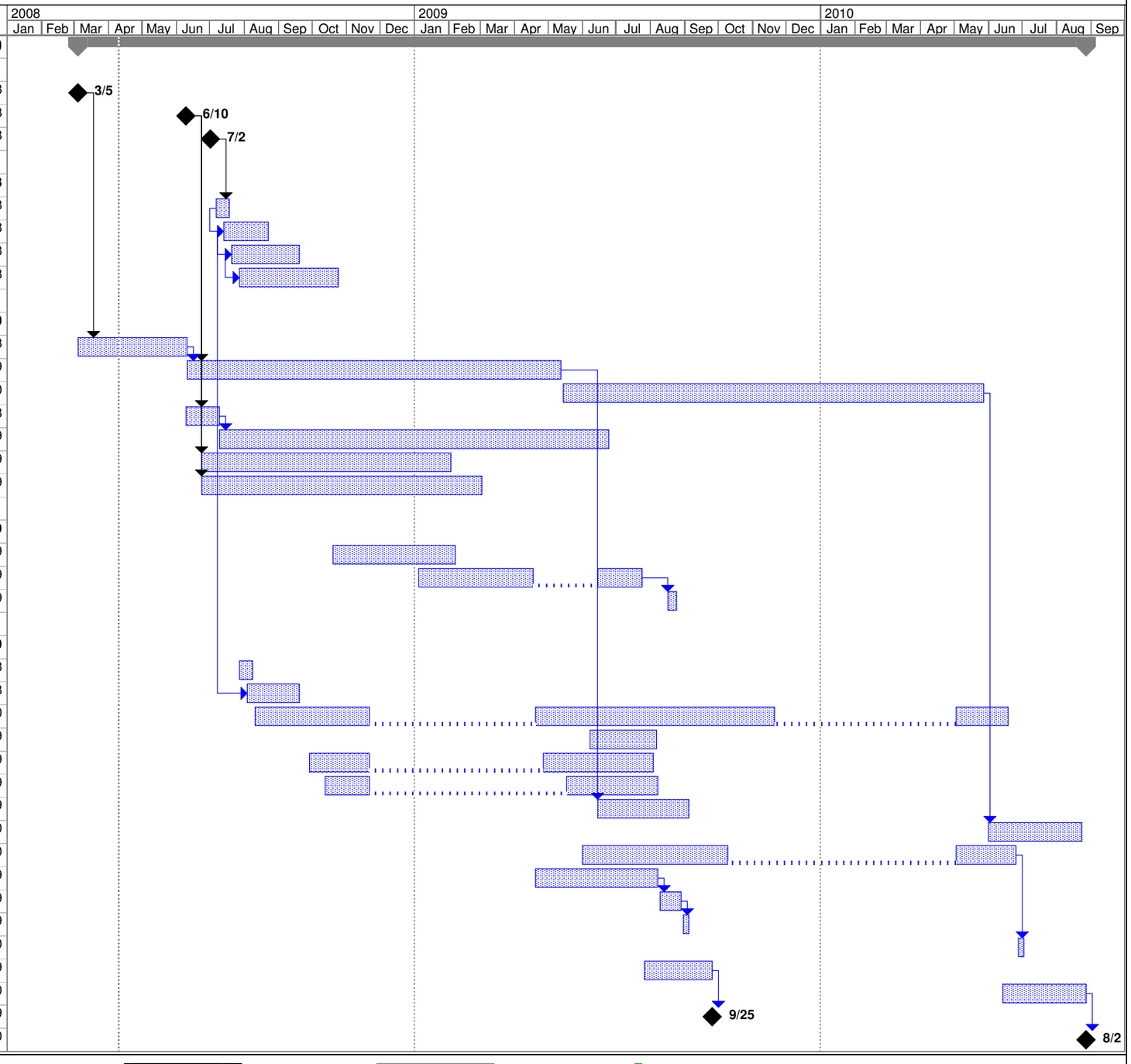
In general, activities during 2008 will consist of surveying, clearing and grading sufficient to implement detailed geotechnical field testing on both Series A and B, as well as roadway improvements, new road construction, and turbine site preparation to allow for Series A turbine erection in spring 2009. Over the winter months, clearing will occur for the 115 kV transmission line, followed by transmission line installation. Along the 115 kV transmission line, winter construction is preferred in order to avoid impact to wetlands traversed during the construction process. Vegetation clearing and work in lower elevations may also occur throughout the Project footprint during the winter.

As discussed in Section 2.3.2, some limited winter construction activities may occur in the higher elevation areas to ensure that permanent, stabilized roadway features may be completed in advance of the spring thaw. Winter construction in higher elevation areas will be limited to completing roadwork and preparation of turbine laydown areas that commenced prior to ground freeze. The winter construction plan includes a protocol to ensure that the surface and subsurface water flow in these areas is fully identified and mapped in appropriate seasonal conditions, as well as other winter-specific erosion and sedimentation control measures.

The spring of 2009 will be the peak construction period at the Project site. During that time, the Series A foundations will be completed and turbines erected. Separate work crews will focus on Series B road construction, turbine site preparation and foundation installation. In addition, the installation of the collector system for Series A and the Kibby Substation will occur in the summer or fall of 2009 in order to allow for a fall 2009 in-service date for the Series A turbines.

Kibby Construction Schedule — Thu 4/10/08

ID	Task Name	Duration	Start	Finish
0	**Kibby Wind Power Project Schedule**	**648 days**	**Wed 3/5/08**	**Fri 8/27/10**
1				
2	Preliminary LURC Approval	0 days	Wed 3/5/08	Wed 3/5/08
3	TC Board Approval	0 days	Tue 6/10/08	Tue 6/10/08
4	Final LURC Approval	0 days	Wed 7/2/08	Wed 7/2/08
5				
6	**Site Investigation / Clearing**	**80 days**	**Mon 7/7/08**	**Fri 10/24/08**
7	Site Mobilization	10 days	Mon 7/7/08	Fri 7/18/08
8	Clearing and grubbing	30 days	Mon 7/14/08	Fri 8/22/08
9	Geotechnical Investigation	45 days	Mon 7/21/08	Fri 9/19/08
10	Gold Brook, Wahl Rd Up-grade	65 days	Mon 7/28/08	Fri 10/24/08
11				
25	**Equipment Procurement**	**582 days**	**Wed 3/5/08**	**Thu 5/27/10**
12	Procure WTGs	70 days	Wed 3/5/08	Tue 6/10/08
14	Delivery WTGs Series A	240 days	Wed 6/11/08	Tue 5/12/09
42	Delivery WTGs Series B	270 days	Fri 5/15/09	Thu 5/27/10
16	Substation Transformer	22 days	Tue 6/10/08	Wed 7/9/08
17	Delivery Substation Transformer	250 days	Thu 7/10/08	Wed 6/24/09
18	Purchase Transmission Poles	160 days	Tue 6/24/08	Mon 2/2/09
19	Delivery 115 kV Cable	180 days	Tue 6/24/08	Mon 3/2/09
20				
21	**Transmission Line**	**221 days**	**Mon 10/20/08**	**Mon 8/24/09**
22	ROW Clearing	80 days	Mon 10/20/08	Fri 2/6/09
23	Transmission Line Installation	105 days	Mon 1/5/09	Fri 7/24/09
24	Interconnection	6 days	Mon 8/17/09	Mon 8/24/09
26				
27	**Wind Farm Installation**	**545 days**	**Mon 7/28/08**	**Fri 8/27/10**
45	Site Mobilization	10 days	Mon 7/28/08	Fri 8/8/08
28	Clearing and Grubbing	35 days	Mon 8/4/08	Fri 9/19/08
29	Road Construction	265 days	Mon 8/11/08	Fri 6/18/10
30	O&M Building Construction	44 days	Mon 6/8/09	Thu 8/6/09
31	WTG Site Preparation	111 days	Mon 9/29/08	Mon 8/3/09
41	Foundation Installation	90 days	Mon 10/13/08	Fri 8/7/09
33	WTG Erection Series A	60 days	Mon 6/15/09	Fri 9/4/09
43	WTG Erection Series B	60 days	Tue 6/1/10	Mon 8/23/10
32	Collector System Installation	135 days	Mon 6/1/09	Fri 6/25/10
34	Substation Construction	80 days	Mon 4/20/09	Fri 8/7/09
37	Substation Commissioning	15 days	Mon 8/10/09	Fri 8/28/09
35	Series A Collector System Energize	5 days	Mon 8/31/09	Fri 9/4/09
36	Series B Collector System Energize	5 days	Mon 6/28/10	Fri 7/2/10
38	WTG Commissioning Series A	45 days	Mon 7/27/09	Fri 9/25/09
44	WTG Commissioning Series B	55 days	Mon 6/14/10	Fri 8/27/10
39	Substantial Completion Series A	0 days	Fri 9/25/09	Fri 9/25/09
40	Substantial Completion Series A & B	0 days	Fri 8/27/10	Fri 8/27/10



Project: Kibby Wind Power Project Sc
Date: Thu 4/10/08

Task — Progress — Summary — External Tasks — Split
Split — Milestone — Project Summary — External MileTask

Figure 2-22: Construction Schedule

Erection of the Series B turbines and installation of the associated collector system will occur in the following construction season, to allow for a final Project in-service date in the summer of 2010.

As noted in Section 2.4.1, quarterly reports will be provided to LURC summarizing construction progress, with more frequent communication in the event of any change or issue requiring LURC notification. Post-construction monitoring activities would commence following completion of the full 44-turbine Project.

In general, construction of the Kibby Wind Power Project will include the following activities:

- Preparation of the construction site (site mobilization);
- Transportation of the equipment, material and construction workers;
- Clearing and grubbing for the construction of the access roads, improvement of the existing roads, construction of new roads and preparation of the turbine site work areas;
- Construction of concrete turbine foundations;
- Installation of the wind turbines;
- Installation of the electrical transmission and collector lines and construction of the transformer substation; and
- Restoration of the work areas.

Note that the linear nature of the construction of the facilities has allowed the routing to avoid sensitive resources and a limited footprint of each project element. The construction effort is intended to most efficiently complete basic infrastructure, then move in a sequenced fashion through the installation process. Table 2-3 (with only minor revisions from the table provided in the Preliminary Development Plan) provides details with regard to the normal sequence of construction efforts, and includes a description of each activity.

Table 2-3: Construction Activities

Activities	Description
1. Site Preparation	
Surveying	- Measurement and identification using Global Positioning System (GPS), flagging tape and other survey markers, the exact site of the limits of clearing, access roads, the wind turbines and the electrical interconnection 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.
Signage and traffic control	- 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 Plum Creek for any shared roads and facilities. Traffic control and 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 evaluation	- Various expert evaluations of the technical needs for site preparation (clearing, grubbing, etc). - Geotechnical evaluation of the Project site.
Site mobilization	- Mobilization and installation of construction trailers and first aid facilities for the employees.
Pre-clearing	- Minimal clearing of trails and minor grading to allow geotechnical testing equipment to drill boreholes at wind turbine sites and other areas requiring specifics of subsurface conditions for design purposes.
2. Clearing	- It should be noted that a large proportion of the Project area is under ongoing active forest management. Consequently, a significant area has already been cleared of trees and other cuts are planned as part of the ongoing forest management activities. Accordingly, TransCanada expects to use, to the extent possible, areas already cleared to facilitate the installation of Project equipment and related infrastructure and to reduce the new clearing required. TransCanada will work closely with Plum Creek to coordinate the removal of all merchantable timber from the Project area.
3. Grubbing	- Earthwork in which stumps and topsoil are removed in order to prepare the ground. Grubbing will be necessary to prepare the access roads, the wind turbine sites and the transformer substation. Topsoil and stumps will be kept on-site and reused for revegetation activities. Stumps will be chipped for mulch and mixed with topsoil for use in the erosion control mix.
4. Construction and improvement of roads	- Since the Project area is currently under active forest management, several logging roads already exist. TransCanada will, therefore, utilize, whenever possible, the existing logging roads in order to decrease the additional clearing required to create new access roads. The addition of vehicle pull-offs and local widening of existing roads will be required.
Construction of the road travelling surfaces and rights-of-way; improvements to existing roads	- Installation using standard road construction equipment (bulldozers, backhoes, graders, compactors) in order to allow the passage of heavy vehicles, such as concrete trucks, cranes and trucks transporting heavy equipment. - Construction with materials existing on the site, if possible (such as previously excavated materials). If necessary, materials from acceptable sources either on- or off-site could be used (envisioned to use all on-site sources).

Activities	Description
Spoil/materials management	- The construction standard is to re-use excavated materials to the extent possible. For initial road improvements, materials will be purchased or obtained from on-site earth-cut areas, but during the construction of new roads and turbine foundations, excavated rock from the new construction will be crushed and re-used for the roads and work areas. Any surplus rock will be made available to Plum Creek and others for maintenance or construction of forestry roads. Any organic material removed during construction will be re-used in preparing erosion control material or placed in a permanent disposal area if unsuitable for construction. Storage areas for excess have been identified.
Installation of new or augmentation of existing watercourse crossings	- Some existing water crossing locations will have to be modified to allow the passage of the heavy/oversized machinery/equipment. - Over-spanning of existing bridges.
5. Installation of new meteorological towers	- New towers will be erected, as discussed in Section 3.5.
6. Installation of wind turbines	
Installation of work areas/final operating areas	- Each wind turbine site will require clearing of approximately 1.0 acre of land which will be levelled, compacted and prepared for the wind turbine foundation and a permanent crane pad. The remaining areas 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 and blasting	- Mechanical excavation using backhoes and other earthmoving equipment will be performed according to site-specific ground conditions related to each wind turbine site. Controlled blasting methods will be employed to remove rock in specific areas such as wind turbine foundations or difficult road cuts.
Foundation installation	- The casting of the concrete foundation is generally carried out in one continuous pour. Up to 720 cubic yards of concrete could be required, depending on the eventual foundation design and conditions at each specific wind turbine site.
Turbine erection	- Once turbine foundations have been installed, cranes with up to 250-ton capacity 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 crawler 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.
7. Installation of the medium voltage electrical collection system	- Medium voltage (34.5 kV) 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.

Activities	Description
8. Installation of high voltage overhead transmission lines	- A high voltage (115 kV) electrical transmission line will exit the substation on wooden poles and will ultimately go cross country over a pre-cleared right-of-way to connect with CMP's existing Bigelow Substation.
9. Transformer substation installation	- Preparation and grading of surface, installation of grounding equipment and security fencing. - Installation of transformers and electrical protection devices.
10. O&M Building installation	- Excavation and casting of a concrete slab foundation, then construction of the building, the dimensions of which are approximately 60 feet by 60 feet.
11. Transportation and logistics	- Transport of the individual components of the wind turbines will be by truck. Oversize load permits will be obtained whenever necessary. - Due to their potential length and width, trucks will need to be escorted, with escort vehicles keeping a certain distance in front and behind, and traffic may be stopped when a turn is necessary. - Special vehicles may be required to transport cranes and the construction equipment to the project area, the individual turbine sites and between turbine sites. - Between 100 and 200 workers are expected to access the site daily with light vehicles (vans, etc.).
12. Revegetation/ 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 20–25 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 implemented according to the specific characteristics of the site.

2.3.2 Winter Construction Measures

As discussed above and in the Preliminary Development Plan application, where feasible, TransCanada intends to conduct clearing of the various Project areas during frozen conditions in order to limit the use of specialized construction techniques such as construction mats that might otherwise be needed to minimize impacts to wet areas. Winter construction considerations are discussed generally in Section 10.0 of the Erosion and Sedimentation Control Plan (Appendix E). The Maine State Soil Scientist identified concerns with road construction and other soil-disturbing activities in the higher elevation areas in frozen conditions. It is TransCanada's understanding that the principal concern was the difficulty in the ability to observe existing hydrology when the ground is frozen, which is necessary in order to select the most appropriate construction measures for maintaining the existing hydrologic flow. As a result, TransCanada will restrict winter construction in higher elevation areas, but proposes limited winter construction in such areas in accordance with the provisions of the following plan.

Goal and Objectives of Winter Construction: Based on substantial experience building roads in high elevation areas, TransCanada believes that overall impacts may be minimized and a more efficient construction schedule maintained if the contractor is able to install permanent,

stabilized roadway and other Project features in advance of the spring thaw. Thus, as long as the underlying hydrology can be identified during appropriate seasonal conditions and other Best Management Practices (BMPs) implemented to minimize exposed areas and erosion and sedimentation, TransCanada believes that limited winter construction can occur in higher elevation areas in an environmentally protective manner. In higher elevation areas, TransCanada would not commence new work following ground freeze, but proposes having the flexibility to complete road construction for those portions of the roads and the turbine laydown areas where testing to identify surface and subsurface water flow has occurred prior to ground freeze.

Identification and Mapping of the Existing Hydrology: Of paramount importance is the proper identification and mapping of the existing hydrology so that appropriate construction measures may be implemented to ensure the existing hydrology is maintained. TransCanada will map the hydrology during appropriate seasonal conditions, i.e., prior to ground freeze, and identify the appropriate "tool box" design measures at that time. The hydrology will be determined through a series of diagnostic test pits carried out in consultation with a qualified soil scientist. The on-site engineer will review the hydrology and determine the appropriate "tool box" design measures based on his or her assessment of conditions prior to ground freeze. Once the hydrology has been mapped and the appropriate "tool box" design measures selected, road construction can occur with minimal impact during frozen conditions.

Limit Soil Exposed Areas: The contractor will limit winter excavation and earthwork area to the maximum extent practicable. Given the linear nature of road construction and the need to identify the existing hydrology prior to ground freeze, it will not be possible to limit the total soil exposed area without stabilization at any one time to less than one acre. Exposed areas will be limited to those areas in which work is anticipated to occur within the next 15 days or that can be stabilized in one day prior to any snow event.

Natural Resource Protection: All disturbed areas within 100 feet of a protected natural resource will be mulched by December 1 and properly anchored with erosion control matting, netting, or protected with an erosion control mix cover. During winter construction, a double row of sediment barriers (i.e., silt fence backed with hay bales or erosion control mix) will be placed between any natural resource and the disturbed areas. Natural resource crossings shall be protected a minimum distance of 100 feet on either side from the resource.

Mulching: Mulching will be done consistent with the Overwinter Construction and Stabilization requirements in BMP A-3 of the Maine BMPs, except that if no precipitation is forecast within 24 hours and work will resume in the same disturbed area within 24 hours, daily stabilization is not required.

Soil Stockpiling: Soil stockpiling will not occur within 100 feet of a protected natural resource. In addition, as necessary, stockpiles will be encircled with erosion control mix berms to prevent sedimentation and runoff during potential rainfall or snowfall.

Overwinter Stabilization of Disturbed Slopes: The provisions for disturbed slopes and soils in the Overwinter Construction and Stabilization requirements in BMP A-3 of the Maine BMPs will be implemented for areas meeting those definitions.

Maintenance: Maintenance measures shall be applied as needed during the entire construction season. After each rainfall, snowstorm or period of thawing and runoff, the site contractor will perform a visual inspection of all installed erosion control measures and perform repairs as needed to insure their continuous function. In the spring, the contractor will inspect and repair any damage and/or bare spots.

2.4 Construction and Post-Construction Monitoring and Reporting

This section provides a discussion regarding a framework for the construction communication and change process, an overview of anticipated third-party inspection requirements during construction, and a discussion of post-construction monitoring and reporting programs.

2.4.1 Engineering Refinement and Change Process

The design detail provided in this FDP reflects TransCanada's plans for development at the Project site. Throughout the course of the construction effort, TransCanada will look for opportunities to refine the Project further in order to reduce construction and operational impacts. This section outlines the anticipated procedure for decision-making at the site throughout the construction process, and a proposed procedure for reporting and LURC review of construction status as well as any anticipated refinements.

Chapter 10.21.G.10.c outlines specific procedures for amendments to the FDP. As noted in that section, minor changes are allowed to be authorized by the LURC Director if required by engineering or other circumstances not foreseen at the time of the FDP approval. The following changes would be considered to rise to a level of more formal review:

- The addition of a land use not previously approved in the Preliminary Development Plan;
- A material change in the site, scope or nature of the Project;
- A material increase in traffic volume;
- A material reduction in open space, landscaping, or parking; or
- A material change giving rise to adverse environmental impact.

The sections below describe the types of changes that are not material, and therefore can be implemented with notice to LURC, as well as defining changes that would require LURC review. The goal is to ensure appropriate LURC communication while maintaining Project construction timelines to maximize use of the limited construction season.

2.4.1.1 Construction Oversight and "Toolbox" Implementation

TransCanada will ensure that their on-site crew includes a qualified inspector responsible for making determinations based on field observations that incorporate appropriate BMPs defined as a part of the Project "toolbox." TransCanada has worked closely with agency staff, including the Maine Soil Scientist, to identify specific measures for conditions anticipated to be encountered. The plans in this FDP document specify assumptions regarding the use of each. It has been acknowledged throughout the Project review process, however, that even with the most detailed knowledge of the site, it will be important to establish the flexibility to respond to in-field observed conditions and implement appropriate construction measures based on in-field conditions.

TransCanada assumes that approval of this FDP will allow for use of any of the identified measures, as appropriate, without the need for prior notification to LURC. It is anticipated that agency personnel, including LURC and the Maine Soil Scientist, may through site reconnaissance observe such decision-making processes to the extent they wish, in order to assure themselves the process is working as anticipated. TransCanada will also provide regular documentation to LURC, as discussed in Section 2.4.1.2, so actions are clearly outlined throughout the construction process.

TransCanada also assumes that Project construction would be allowed to occur without further approval at any location within the identified footprint. For example, as geotechnical details identify the most suitable locations for the turbines, they may be located at any point within the specified 1-acre turbine construction area. Road alignment adjustments that have no new resource impacts, and that meet LURC's standards for Level B Road Projects,[1] are also assumed to be allowed in order to adjust for observed site impact issues and facilitate the overall minimization of construction and operational impacts.

In addition to TransCanada's engineering oversight, environmental inspection will be an important element of the construction process, as outlined in detail in Section 2.4.2. The engineering and environmental personnel will each have the authority to stop work or redirect Project efforts in the event a refinement decision is necessary that could result in a material change requiring further consideration or review.

2.4.1.2 Reporting and Change Documentation

TransCanada intends to continue working in an open manner throughout the construction process, and would like to ensure that LURC is fully apprised of the construction status as it develops. Because seasonal differences and field-encountered issues always require

[1] Level B Road Projects: Minor relocations, and reconstructions, involving limited work outside of the existing right-of-way of public roads or private roads [here, the approved road alignment]…; "Minor relocations" as used herein may not exceed 300 feet in horizontal displacement of centerline. "Reconstruction" as used herein may involve widening of existing rights-of-way not to exceed 50 feet on either side. 10.02.71.

adjustments in the scheduling and implementation process, regular reporting will keep LURC properly apprised of Project issues. Several different types of reporting are proposed in addition to routine site visits and other construction inspections:

- Routine reporting – TransCanada will maintain internal documentation and will continually update the Project schedule as a construction management tool. TransCanada proposes to provide a quarterly summary of Project activities and construction highlights, as well as an update to anticipated Project schedule. This will allow LURC a means to formally monitor the construction process and understand the implications of seasonal and logistical issues that may be encountered. Any non-material changes incorporated will be summarized in each quarterly report. At certain points of the construction process, key milestones may be achieved that will warrant reporting out of the quarterly cycle. For example, if completion of the primary geotechnical investigation were to result in material changes to the information reflected in the FDP, a milestone-driven report would be prepared for LURC, along with applicable requests for review and identification of Project work that would continue in the interim so LURC is clear which work is in suspension pending confirmation, and which work – not affected by potential changes – is still in process.

- Material change reporting – Irrespective of milestone events, TransCanada will notify LURC in writing of identified material changes determined to be necessary. As for milestone reporting, TransCanada will specify work that will continue in parallel with the LURC review process.

- As-built reporting – At the completion of a particular phase of construction or at the end of the installation (depending upon how the construction schedule is managed), TransCanada will prepare as-built drawings and a brief summary report to reflect the conditions of the Project as constructed. This will be submitted to LURC for its records and will provide a useful framework for post-construction monitoring.

If and when material changes are identified, it is anticipated that LURC staff will promptly conduct a preliminary review of the information to provide an indication of the process required. It is anticipated that most changes would be minor enough that a staff level review would be sufficient. It will, however, be important to the overall construction process to understand the anticipated process so the schedule of other work can account for the anticipated "hold" time on the requested change. TransCanada will work closely with LURC staff and other agencies to keep communication channels open to construct a Project that is consistent with the overall impact levels initially approved and incorporate refinements that continue to improve the Project.

2.4.2 Environmental Inspection

TransCanada will employ an environmental inspector during active construction and restoration of the Project. The inspector will have the following minimum qualifications:

- A degree in an environmental science or civil engineering, or other demonstrated expertise.
- A practical knowledge of erosion control practices and stormwater hydrology.
- Experience in management or supervision on large construction projects.
- The ability to understand and articulate TransCanada standards and permit requirements and conditions concerning erosion control or stormwater management to contractors.
- The ability to clearly document and communicate activities being inspected.
- Appropriate facilities available to them, and, if necessary, support staff to carry out the duties and responsibilities, as described in the following section.

The environmental inspector will be responsible for ensuring compliance with the requirements of the erosion and sediment control and stormwater management plans, the construction drawings, the environmental conditions of the LURC certificate, proposed mitigation measures, and other federal or state environmental permits and approvals. Specific responsibilities will include:

- Ensure that all construction and stabilization activities comply with approved designs, applicable permit conditions and TransCanada standards.
- Ensure that field decisions regarding erosion and sedimentation control implementation, stormwater management measure installation, and natural/sensitive resource protection are based on sound considerations and in cooperation as necessary with the appropriate authorities.
- Ensure effective communication between TransCanada and the applicable agency regarding any changes to the erosion and sediment control, stormwater management, or final stabilization plans.

Prior to construction the inspector will become thoroughly familiar with:

- The terms and conditions of applicable TransCanada standards and the applicable permit requirements and conditions.
- The proposed construction schedule, including the timing for installation and removal of erosion controls, the timing for construction and stabilization of any erosion control related structures, and the deadlines for completing stabilization of disturbed soils.
- The Project site, potential affected natural resources, Project plans and specifications, including those for building stormwater measures, those for installing the erosion control

measures to be used on the site, and those for temporarily or permanently stabilizing disturbed soils in a timely manner.

During construction the inspector will:

- Monitor the contractor's installation and maintenance of the erosion control measures called for in the applicable permits and any additional measures the inspector believes are necessary to prevent sediment discharge to off-site properties or natural resources. This will be based upon the approved erosion control plan (Appendix E), field conditions at the time of construction, and the natural resources potentially impacted by construction activities.

- Monitor the contractor's construction of the stormwater system, including the construction and stabilization of ditches, culverts, detention basins, water quality treatment measures, and storm sewers.

- Monitor the contractor's installation of any stream or wetland crossings.

- Monitor the contractor's final stabilization of the Project site.

- Keep logs recording any rain events at the site, the contractor's activities on the site, discussions with the contractor(s), and possible violations of permit conditions.

- Inspect the Project site at least once a week and before and after any significant rain event. Note that the frequency of inspection can be varied to best address the Project needs. The inspector will document all protected natural resources both before and after construction and will document all areas of non-compliance.

- Prepare and submit reports to TransCanada, at a frequency to be determined (as performed, weekly, bi-weekly, etc.).

The inspector will submit written inspection reports, including documentation of potential non-compliance issues, on a form provided by TransCanada. The reports will summarize construction activities and events on the site for the previous work period, as outlined below. The report will:

  - State the name of the development, its permit number(s), and the start and end dates for the inspection time frame (week, Monday through Sunday, etc.).

  - State the date(s) and time(s) when the inspector was on the site making inspections.

  - State the date(s) and approximate duration(s) of any rainfall events on the site for the week.

- Identify and describe any erosion problems which resulted in sediment leaving the property or sediment being discharged into a wetland, brook, stream, river, lake, or public storm sewer system. The report will describe the contractor's actions to repair any damage to other properties or natural resources, actions to eliminate the erosion source, and actions to prevent future sediment discharges from the area.

- List the buildings, roads, parking lots, stream crossings, or other features open to construction for the reporting period, including those features or areas actively worked and those left unworked (dormant).

- For each area open to construction, list the date of initial soil disturbance for the area.

- For each area open to construction, note which areas were actively worked that reporting period and which were left dormant during that period.

- For those areas actively worked, briefly state the work performed in the area that reporting period and the progress toward final stabilization of the area, e.g., "grubbing in progress," "grubbing complete," "rough grading in progress," "rough grading complete," "finish grading in progress," "finish grading complete," "permanent seeding completed," "area fully stable and temporary erosion controls removed," etc.

- For each area open to construction, erosion and sedimentation control measures installed, maintained, or removed during the reporting period.

- For each erosion control measure in-place, note the condition of the measure and any maintenance performed to bring it to standard.

2.4.3 Post-Construction Monitoring and Reporting

The following programs for post-construction monitoring and reporting are proposed in association with the Project. As additional detail is developed or modifications made, LURC will be notified to determine whether such information is material.

2.4.3.1 Stormwater Management and Erosion Control

Stormwater management and erosion control measures designed for Project implementation (as further discussed in Section 9.2) are consistent with DEP BMPs and have specifically focused on measures that are low maintenance and thus have long-term functionality. Consistent with the Erosion and Sedimentation Plan provided in Appendix E, periodic inspections will continue throughout and following the construction effort until stabilization has been confirmed. Once site stabilization has been achieved, inspections will be limited to maintenance observations that will occur on a regular basis during the course of routine site activities. A review of stormwater management features will be undertaken following significant rainfall events during the first two years of operation in order to confirm adequate functioning

and to make any necessary design adjustments to ensure appropriate water flow, control of sediment-laden runoff and soil stabilization.

2.4.3.2 Avian and Bat Mortality

TransCanada has worked closely with Maine Department of Inland Fisheries and Wildlife (MDIFW) and USFWS to develop and implement study protocols for pre-construction monitoring that provided a robust indication of the range of species and species use throughout the Project area. In order to further understand the impact of wind power impact on avian and bat species and to confirm that this Project will not result in significant avian and bat mortality, TransCanada has continued to work with MDIFW and USFWS in developing a meaningful post-construction program.

In determining an appropriate study program for post-construction efforts, TransCanada reviewed precedents established by other wind energy facilities in Maine, and industry information available through wind energy trade organizations. The protocol developed as a result of this effort was presented to MDIFW and USFWS for review at a meeting on March 27, 2008, and revisions were incorporated to respond to agency comments. Details of the current plan are as determined by MDIFW, and will be adjusted further based on any additional comments MDIFW may offer as a part of FDP application review. LURC will be notified prior to implementation of the post-construction monitoring program and any refinements to the program will be identified.

Migratory Study Protocol

Within 12 – 24 months of installation and declaration of commercial operation of the full 44 turbines, TransCanada proposes to fund and conduct the following avian and bat monitoring program in Year 2 of operation in order to monitor avian and bat activity and to assess mortality. This will include:

- Standardized searches during spring migration and fall migration periods for birds and bats;
- Searcher efficiency trials to estimate the percentage of carcasses found by searchers; and
- Carcass removal trials to estimate the length of time that carcasses remain in the field for possible detection.

Other survey methods will also be employed in Year 2 in order to compare post-construction to pre-construction monitoring. In addition, throughout the Project's operating life, documentation will occur when bird or bat casualties are noted and weather conditions will be monitored.

TransCanada plans to conduct follow-up monitoring in Year 5, as well, and will adjust the scope of the future efforts through consultation with MDIFW based upon the Year 2 findings and other

relevant information that may be available through industry studies. Depending upon the number of casualties documented during the initial year of survey, indications of correlations between casualties and weather, or indications of correlations between casualties and bird or bat activity, the need for future monitoring could be adjusted.

Identification of Study Areas and Search Methodology

Monitoring will entail regular, systematic searches of the area beneath a subset of turbines and guyed met towers by trained technicians. Representative turbines will be selected (two on Series A, one on the western leg of Series B, and one on the eastern leg of Series B). In addition to these four primary search areas, 10 additional turbine locations (for a total of 14 turbine search areas) and two permanent met towers (one each on Series A and Series B) will be selected for less intensive survey, to ensure that over 25 percent of the 44 turbines are included in the study. Selection of specific sites will be documented in a decision tree for review with MDIFW prior to implementation of the field program. Site selection will include such factors as large clearings/openings, data collected during pre-construction monitoring efforts to target highest-impact areas, geographical spread and other factors. The same locations will be maintained throughout the duration of the monitoring, although the study area could be adjusted or expanded based on findings.

Appropriate permits will be obtained from the USFWS and MDIFW's Bangor office for possession and handling of songbirds. Searches will be conducted during both spring migration (April 15 – May 31) and fall migration (August 15 – October 15) seasons. During each time period, the four identified turbines will be searched daily (five times per week), while the additional 10 turbines will be searched every three days (two times per week). Additionally, the two met towers will be searched twice per week.

The standardized searches will focus on monitoring the cleared and leveled laydown areas around each selected turbine and applying a correction factor to account for fatalities that fall outside of the smaller search plots. The methods for calculating the correction factor will be determined through further discussion with MDIFW. Although fatalities can be found at considerable distances from the base of the turbine, terrain and vegetation constraints make a larger study area impractical. Focusing on the cleared area surrounding each turbine is anticipated to be appropriate, as studies have found that the majority of fatalities were observed in locations within 150 feet from the turbines (Kerns and Kerlinger 2004;[2] Arnett et al. 2005[3]).

[2] Kerns, J. and P. Kerlinger. 2004. A study of bird and bat collision fatalities at the MWEC Wind Energy Center, Tucker County, West Virginia: annual report for 2003. Technical report prepared by Curry & Kerlinger, LLC for FPL Energy and MWEC Wind Energy Center Technical Review Committee.

[3] Arnett, E.B., J. Kerns and W.P. Erickson. 2005. Bat and bird fatality at wind energy facilities in Pennsylvania and West Virginia. Pages 24-95 in E.B. Arnett, technical editor, Relationships between bats and wind turbines in Pennsylvania and West Virginia: an assessment of bat fatality search protocols, patterns of fatality, and behavioral interactions with wind turbines. A final report submitted to the Bats and Wind Energy Cooperative. Bat Conservation International. Austin, Texas, USA.

Plots will be searched by walking along parallel transects located at regular intervals across the turbine laydown area. Initially, transects will be set at 6 – 8 meters apart. A searcher will walk at a rate of approximately 45 – 60 meters a minute along each transect, searching on both sides out to 3 – 4 meters for casualties. Depending upon whether casualties are found, it should take an average of 60 minutes to search each plot and then travel to the next. In addition to trained professionals, the search process may be designed to utilize dogs in order to maximize carcass observations.

All casualties found will be documented on standardized field forms, photographed, collected and, if a state or federally listed species, reported within 24 hours of identification. The type of observation or condition of carcasses will be recorded, such as intact carcass, scavenged, or feather spot. The bearing to the center of the wind turbine being searched will be recorded and the distance to the turbine will be determined using a laser range finder and recorded.

All casualties found incidentally during normal on-site operations at the Project will also be recorded and collected (only at turbines and along roads not included at search sites). Operations personnel will be instructed on the handling and notification requirements for these occurrences.

Searcher Efficiency Trials

Searcher efficiency trials will be conducted in the same area as the searches to estimate the percentage of avian and bat casualties that are found by searchers. The trials will consist of periodic placement of carcasses at the search turbines the night before searches occur (to reduce the likelihood of scavenging). Searchers will be unaware of the timing of these trials.

The carcasses used for these trials will be obtained during earlier searches and will be marked with a small piece of black electrical tape placed around a leg or other similar small identifier. If too few carcasses are available, then surrogate species of a similar size such as native species will be obtained. Estimates of searcher efficiency will be used to adjust for detection bias using methods similar to Kerns et al. (2005).

Carcass Removal Trials

Two carcass removal trials will be performed during each survey period (i.e., one in spring and one in fall), independently of the searcher efficiency trials. The objective will be to estimate the percentage of bird and bat carcasses that disappear from survey plots due to scavengers. Estimates of carcass removal will be used to adjust the number of carcasses found, thereby correcting for this removal bias.

For each trial, a minimum of six but preferably 25 carcasses (species composition as noted for efficiency trials) will be placed near search plots (but not in plots to avoid contamination from blowing feathers, etc.). Feather spot trials will also be included. All birds and/or feather spot

areas will be checked on days 1, 2, 3, 4, 5, 7, 10 and 14, or until all evidence of the carcass is absent. On day 14, all carcasses, feathers or parts will be retrieved and properly discarded.

Additional Survey Methods

Some additional field efforts to monitor bird and weather conditions will also be performed during the post-construction casualty monitoring surveys to allow for meaningful correlation. These efforts are designed to evaluate the efficacy of pre-construction survey methods to predict actual numbers of fatalities resulting from a proposed wind turbine development, and incorporate the use of radar surveys for discrete time periods. Recording weather conditions will also be important to understanding patterns of avian site use.

A brief radar survey will be conducted during the peak fall migration period. This will consist of a single location for radar data collection timed to occur immediately after the passage of a cold front. This will allow for data collection during a typical fall migration "big night" and two subsequent nights of decreasing migration activity. The selected site will include clear radar views of the rotor swept zone of one or more turbines during both horizontal and vertical operation. The survey duration (anticipated to be on the order of 10 – 12 nights) will be defined through a statistical analysis of pre-construction monitoring data to assess variability and thus determine the amount of post-construction data required to allow for a comparison providing appropriate sensitivities. The statistical evaluation and resulting number of nights identified, as well as the proposed monitoring location, will be reviewed and approved by MDIFW prior to implementation. The overall objectives of the survey will be to test whether relationships can be detected between migration activity (passage rate, flight height, flight direction) and fatalities, as a means to investigate the efficacy of pre-construction surveys to predict fatalities during operation.

Weather conditions will be recorded at the on-site met towers or turbines throughout the duration of the survey effort. Parameters collected will include wind speed, wind direction, temperature at or near hub height, ground temperature, barometric pressure, relative humidity and precipitation.

Reporting

TransCanada will present the results of the monitoring studies at a coordination meeting with MDIFW, LURC and USFWS following each sampling season after each full year (spring – fall) of monitoring and no later than March 31. Methods and results of monitoring will be discussed. Estimates of the total number of wind turbine related fatalities will be based on:

- The observed number of carcasses;
- Searcher efficiency expressed as a proportion of trial carcasses found by searchers;
- Removal rates expressed as the length of time a carcass remains in the study area and is available for detection by searchers; and

- A calculated number of casualties based upon the above information.

Additional factors that could be considered include:

- The proportion of casualties likely to land or move outside the plot (such as forested areas beyond the cleared area surrounding the turbines); and

- An estimate of the number of carcasses found by observers where cause of death could not be attributed to Project features or operation.

Calculation methods are presented in Arnett et al. (2005).

Following the meeting, a report will be prepared to document findings.

Ongoing Post-Construction Commitments

The post-construction monitoring plan includes commitments that extend beyond the initial studies. TransCanada has agreed that, in the unanticipated event of a significant mortality incident, LURC and MDIFW will be notified within 24 hours of discovery. TransCanada will immediately implement a "root cause analysis" to determine the likely cause, and will consult with LURC and MDIFW within a seven-day period to present the results of the root cause analysis and determine an appropriate response.

TransCanada is committed to Project operations with a minimal impact on avian and bat species, and will work closely with MDIFW, LURC and USFWS to implement necessary strategies in the event unanticipated impacts occur.

2.4.3.3 Northern Bog Lemming Habitat

As stated in the Rezoning Petition and Application for Development dated April 2007, the area of potential northern bog lemming habitat on the site has been avoided by Project elements, and re-routing of roadways has been undertaken to ensure that the potential habitat and its drainage is not disturbed or segmented. It is, therefore, not anticipated that impact to the species or its habitat will occur as a result of the Project.

TransCanada continues to work with MDIFW in order to determine a scope for habitat monitoring to confirm that opportunities for this species continue to be provided at the project site. A draft plan for post-construction monitoring has been prepared, and was reviewed with MDIFW at a meeting on March 27, 2008. Agency comments have been incorporated into the proposed plan. It is assumed, however, that additional refinements to the plan could occur prior to implementation. TransCanada will provide to LURC an update and, if necessary, revised monitoring plan prior to post-construction implementation. Details of the currently agreed-upon plan are outlined below.

MDIFW and TransCanada agree that trapping to definitively determine the presence or absence of northern bog lemming would be counter to species protection. It is not currently known whether northern bog lemming utilize the identified habitat area, but suitable habitat has been identified with signs of use by similar species. Construction and post-construction measures will focus on avoidance of the suitable habitat and its watershed, and on field observations to document habitat usage. No species-specific identification (e.g., trapping, DNA identification from feces) is proposed.

No work will occur within the identified area of potential habitat or its watershed. Prior to the commencement of construction activities, flagging will be placed in the field to clearly identify the limits of this "no work" area. Ongoing construction inspections will include confirmation that intrusions have not occurred within this area.

Field studies will consist of a pre-construction field effort, followed by one additional year of field evaluation proposed to be two years following completion of full Project construction. Pre-construction study will occur in the late summer, when species activity is anticipated to be greatest, and post-construction years will include observations at that time as well as in the spring (with some remaining snow cover to allow for maximum potential runway visibility). Post-construction observations will be performed during the first full spring/summer following operation of the full Project, as well as during the spring/summer period three years following that operational date.

During each proposed field event, documentation will be provided with regard to observed indications of use such as runways and feces latrine areas. Field notes and photographs will be taken. MDIFW will be informed prior to each field visit in order to have the opportunity to participate in the field observations.

Documentation will be provided to LURC and MDIFW in the form of a field memo at the end of each survey summer, consolidating any available information about related activities and survey observations. At the end of the final survey, a consolidated memo will be prepared that summarizes the findings, as well as consultation with MDIFW, and indicates the need for any potential future efforts.

2.4.3.4 Confirmation of the Project's Contribution to the State's Environmental and Energy Policy Objectives

Condition 2 C (1) of the March 5, 2008 Rezoning and Preliminary Development Plan approval requires the Project to submit with the FDP a proposal to evaluate the contribution of the Project to the State's environmental and energy policy objectives. Among the important environmental and policy objectives to which the Project will contribute are the generation of electricity from a renewable form of energy,[4] and the goal of reducing carbon dioxide (CO_2) emissions by 600,000

[4] CLUP at 40

tons by 2018.[5] In addition to CO_2, generation of electricity from fossil fuels results in atmospheric emissions of nitrogen oxides (NO_x), a precursor to the formation of ozone (smog) and a contributor to acid rain, and sulfur dioxide (SO_2), a contributor to acid rain. Displacement of fossil fuel-fired generation that would reduce emissions of these pollutants would also contribute to State environmental and energy policy.

For the first two years of operation, the Project will report annually to the LURC on the Project's contribution to these policy goals. The report will include the total amount of electricity generated in megawatt-hours, by month, during the preceding calendar year.

The report will include a quantification of the amount of regional emissions of CO_2, NO_x and SO_2 that were displaced by the Project. This analysis will rely on data published by the Independent System Operator – New England (ISO-NE) in its annual *New England Marginal Emissions Rate Analysis,* which provides separate marginal emissions rates for peak,[6] off-peak, ozone season,[7] and non-ozone season periods. Marginal emissions rates presented in the ISO-NE report are calculated based on actual generation data and, therefore, provide an extremely accurate estimate of the emissions characteristics of the specific electric generating units that would have been called upon to run if the Project were not generating electricity during those times. The emissions displacement analysis will utilize actual electricity generation data for the specific periods above along with Maine-specific marginal emission rates during those periods, and a small adjustment to account for transmission line losses, to derive an estimate of the total emissions that were displaced by the Project's operation.

[5] An Act to Provide Leadership in Addressing the Treat of Climate Change, 2003; and An Act to Establish the Regional Greenhouse Gas Initiative, 2007

[6] Peak hours are defined as non-holiday weekday hours between 7 a.m. and 11 p.m. All other hours are off-peak.

[7] The ozone season runs from the beginning of May to the end of September.

3.0 ROAD AND TURBINE LOCATION AND DESIGN

The 44 wind turbines, met towers and associated access roads represent the most significant Project elements. The majority of work on these Project elements will occur within the D-PD district, with some roadways and roadway improvements located in the M-GN district and minor activity outside of the D-PD zone but within the P-MA. Clearing and grading in the initial construction phases will be completed to the extent necessary for geotechnical program completion; completion of the road installations will utilize information gathered through that program. The geotechnical program will also allow refinement of turbine foundation design. Logistical details developed by TransCanada and the selected contractors will also refine the extent of crane movement required. Depending upon those implementation logistics, road widths may be able to be narrowed and impacts reduced. The following narrative provides final design details assuming a maximum-impact approach so that any construction field-decisions will result in no greater impact than represented in this FDP.

The following sections review: anticipated levels of traffic use and signage; proposed improvements to existing roads; proposed new road construction; information regarding the geotechnical plan implementation; turbine design details; cut and fill calculations; and information with regard to proposed stabilization and revegetation.

3.1 Traffic and Signage

Turbine components will be transported from the nearest seaport either in Quebec or Maine and delivered to the Project site. The turbine components will travel either from the North through Quebec and along Highway 27, or from the South along Highway 27 to Gold Brook Road.

In addition to the trips generated by delivery of the turbine components, deliveries of equipment for the transmission line, substation and O&M Building construction will occur. These additional deliveries will arrive from either direction depending on the procurement source.

Oversize load permits for size and weight will be acquired from the Maine Bureau of Motor Vehicles as appropriate. Additionally, TransCanada and Plum Creek will coordinate with the MDOT, Maine State Police and others as appropriate to ensure that all appropriate safety precautions are taken and to ensure minimal effect to other roadway users.

Traffic flow in general will be toward Gold Brook Road in the morning, and toward Eustis in the afternoon. Construction traffic will vary throughout the various phases of the proposed three-year construction schedule. The estimated vehicle transportation associated with the Project during times of peak activity is outlined in Table 3-1. Peak activity is estimated to occur during the summer period when overlapping activities associated with completion of the Series A turbine installation, the Series B roads and turbine foundations, and the Kibby Substation result in several different crews accessing the site. The number of vehicle trips will depend substantially on the amount of carpooling between site workers and the type of foundation selected, which affects the number of concrete trucks. It is also important to note that the

turbine components and construction equipment will be delivered on specialized transport vehicles, while most of the vehicle traffic will be tractor trailers or passenger vehicles.

Table 3-1: Transportation Associated with the Wind Turbines and Other Project Components

Component	Typical Load	Average Number of Truckloads Per Day
Construction Personnel	During peak construction there will be 120 – 150 construction personnel on-site; it is assumed that only approximately 50 personnel vehicles will drive to the site.	50
Construction Equipment	Moving of construction equipment to and from the site.	12
Material Delivery	Delivery of various materials to the site (does not include turbine components, cut and fill material, wood or concrete).	15
Concrete Trucks	Up to 80 concrete truckloads per foundation.	80[1]
Turbine Components[2]	Blades (3 blades, each 144 feet in length). One to two blades per truck.	3
	Tower (4 sections, each 65 feet in length). One section per truck.	4
	Nacelle (heaviest piece at 70 tons). One nacelle per truck.	1
	Hub. One hub per truck.	1
	Miscellaneous components. One "lot" per truck.	1
	Total	*10*
Cut and Fill	Minimal from within site area, 10 to 20 cubic yards per dump truck.	To suit site conditions
Logging trucks	To be determined by Plum Creek.	To be determined
Other Traffic	This includes visitors, consultants, etc.	10
Total (estimated)		***177***

[1] Concrete estimate reflects the gravity-type design, and will be less where socket-type or rock anchor foundations are installed.

[2] Turbine component daily vehicle trips assume one turbine being installed per day. This will vary depending on the actual number of turbines or parts of turbines installed.

The majority of on-site construction traffic will travel along Gold Brook Road and other branch roads (e.g., Wahl Road and Spencer Bale Road) to construction areas. TransCanada may construct a batch plant at the construction control center located at the intersection of Gold Brook Road and Route 27. Construction worker vehicle parking will also be accommodated at that location, and transportation logistics to other portions of the Project site will be managed from that location.

Signage for the Project during construction, other than the primary sign for the Project, will be limited to informational signs associated with site activities and roadway closures as necessary. Most of the signage will be for information dealing with traffic management or health and safety issues. Where required or relevant, specific signage will be developed with Plum Creek for shared roads and facilities. Signs associated with Project construction and operations are anticipated to be consistent with LURC standards in 10.27.J. A primary sign is anticipated to be located at the construction control center (which will be the future site of the permanent O&M Building). Sign information will include the Project name and ownership, construction contractor information, and contact information. The sign will direct visitors to check in at the construction control center (later, the O&M Building) for additional Project information or to access the site.

Following construction, the permanent sign near the O&M Building will remain (revised to reflect post-construction information), and signs will be posted near each turbine prohibiting climbing or other access to the structures. Public access to the site will not be restricted (with the exception of around the Kibby Substation for safety reasons), and the current uses of the site, as allowed by the landowner, can continue following completion of construction.

3.2 Improvements to Existing Roads

The primary private road to be used to access all turbine locations is Gold Brook Road (also known as Beaudry Road), which intersects Route 27 just south of Lower Pond in Chain of Ponds Township. Gold Brook Road runs generally north through the Project area. Access to the turbine sites from Gold Brook Road will be via the extensive network of existing logging roads on the Plum Creek property and new access roads as outlined in the Project's Preliminary Development Plan application.

Many of the existing logging roads, including Gold Brook Road, are currently suitable for construction and operational Project use. They currently experience significant truck traffic and are utilized by heavy equipment. Roadway improvements will be implemented, consistent with Plum Creek's seasonal roadway activities, to ensure road grades, widths and curves are adequate for delivery of turbine components and are maintained in serviceable condition. No major improvements or changes to the roads or bridges are anticipated. Where bridge weights are not sufficient, a temporary span will be placed across the existing bridge structure, resulting in no environmental impact or permanent change to accommodate Project construction needs.

All existing private roads are owned by Plum Creek and are private commercial forestry roads, extensively utilized by logging trucks. Public access is allowed, and the roads are used by local travelers. Public access to the existing roadway network will continue to be allowed during construction and operation of the Project. However, there may be times during Project construction that the existing private Plum Creek roadway network is temporarily closed to the public due to the nature of the construction activities (e.g., blasting) or the delivery of large pieces of equipment. Construction activities and equipment delivery requiring road closure will be scheduled to the extent possible to minimize disturbance during high use periods. Additionally, signs will be posted notifying users of roadway closures.

Because the existing roads are used by other traffic, pull-off locations will be created along Gold Brook Road and Spencer Bale Road that will enable safe traffic management along these existing roads during construction. The location of the pull-offs are shown in Figure 3-1. Each will be approximately 250 feet long and 20 feet wide in size, and have been located to avoid impact to sensitive natural resources (e.g., wetlands, streams).

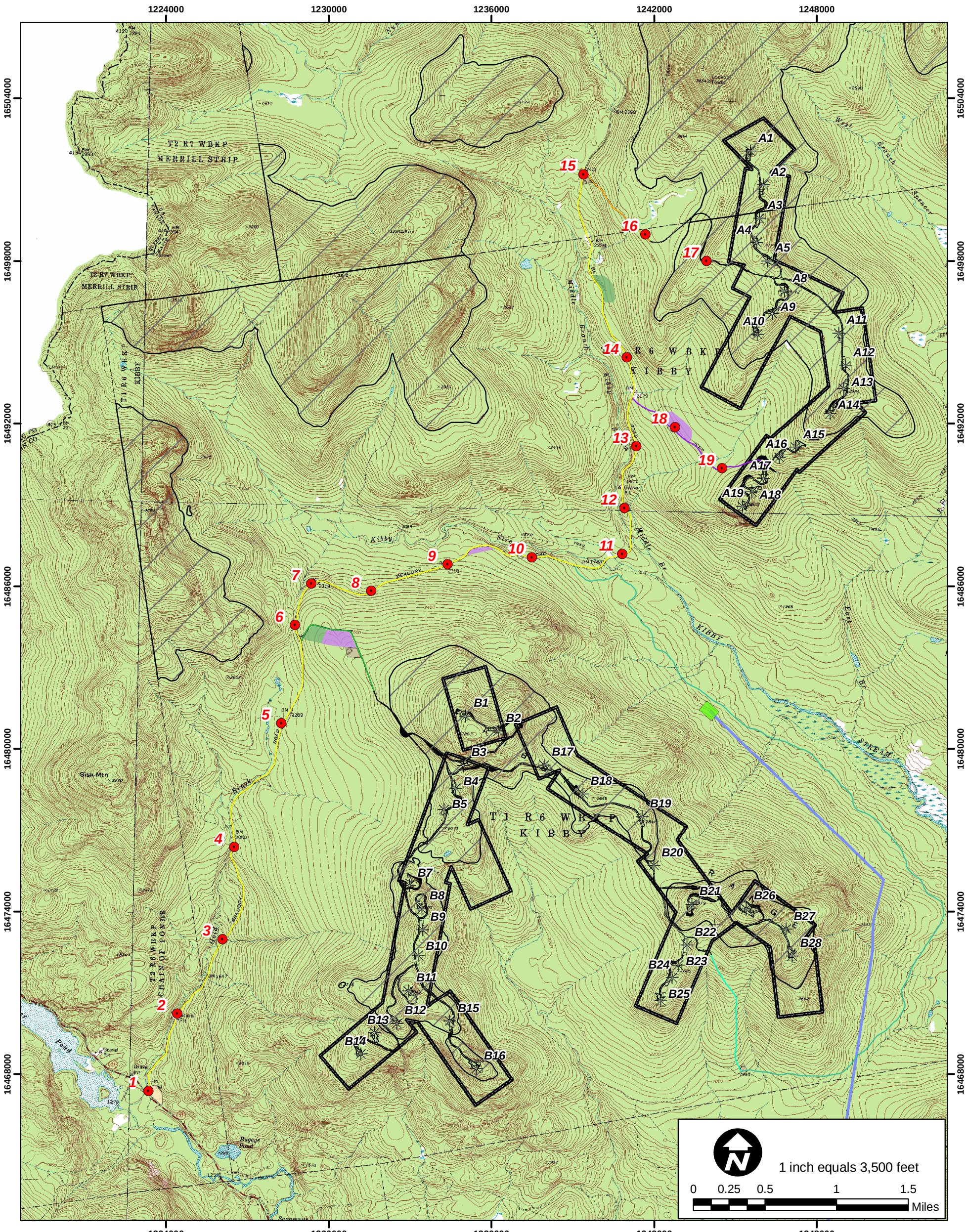
If locations for the pull-offs change due to an adjustment in construction logistics, the revised locations will be approximately the same size and will similarly avoid sensitive areas. It is anticipated that the pull-offs will remain in place for use by Plum Creek and others following the construction effort. Plum Creek will continue to have ownership and responsibility for maintaining these existing logging roads, which are considered "land management roads" under LURC definitions.

Portions of existing roads that will be upgraded for access to the turbines are included in the final design drawings illustrating proposed new road construction, provided in Appendix F, and are addressed in the following section.

3.3 New Road Construction

The road and turbine locations reflected in the Preliminary Development Plan were selected based on detailed and iterative engineering and environmental review. FDP drawings are provided in (Appendix F) that have further refined the layout in selected locations in order to continue reducing wetland impact and balance cut and fill requirements. As noted in Table 2-1, wetland impacts have been reduced significantly.

Technical specifications for the new access roads are provided in Table 3-2.



LEGEND

- Turbine Locations (LURC)
- # Pull-Off Areas
- Turbine Access Roads
- Transmission Line (~44 km)
- LURC PMA Zone
- Disposal Area
- Bigelow Substation
- Proposed Kibby Substation (~6 acres)
- Series A & B Laydown Area (~19 acres total)
- Material Handling & Storage/Stone Crusher Location (~28 acres total)
- Potential Alternate Concrete Batch Plant, OEM Building, & Parking Area (~5 acres)
- A1 Access Needing Imp
- B1 Access Rd Needing Improvement
- B2 Access Rd Needing Improvement
- Goldbrook Rd Needing Improvement
- Spencer Bale Access Rd Needing Improvement
- Wahl Rd Needing Improvement
- Rezoned Area

Revision Date: 04/10/08

FIGURE 3-1

Roadway Pull-Offs & Temporary Work Areas Kibby Wind Power Project Franklin County, Maine

Notes:
1. This map supercedes all previous maps. Site boundaries and surface features are approximate only and are subject to location by an actual field survey.
2. Coordinate system:UTM NAD83 Zone 19 Feet

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Table 3-2: Technical Specifications for Access Roads

Dimensions	
Turbine access roads	- Traveling surface 20-25 feet wide - Side slopes 2H:1V (with exceptions)
Curves	- 26 feet width - Distance between curves: 150 feet - Minimum internal radius of curve 150 feet[1]
Ditches	- 1-2 foot height - 2-6 foot bottom width - Slope of sides 2:1 - Top width 6-14 feet
Ridgeline access roads	- Traveling surface 34 feet in width to allow crane to "walk" between sites
Slope and Leveling	
Maximum slope for standard equipment	10%
Maximum slope for short distance[2]	12%
Limits of deviation	6-inch maximum over 140-foot span of trailers[3]

[1]The minimum distance between curves was a general goal but could not always be achieved due to geometric constraints and efforts made to minimize cut/fill and impacts to environmental features, particularly wetlands.
[2]The maximum slope may be increased to 12% in exceptional circumstances for short distances.
[3]Lengths of vertical crest curves were established to allow for a 6 to 9 inch clearance beneath the beds of the transport vehicles. This length varied based on the grades of the approach tangents on both sides of the vertical curve.

The new access roads will be built as gravel roads, with 20 to 25 foot wide travel surfaces. Ditches or other measures (as outlined in Section 9.2) will be provided for stormwater management. Vegetation may be cut back at the edges during construction to allow for the passage of wide loads. A load-carrying capacity of 90 to 100 tons is required.

Access to the A Series will be from two locations. The majority of the A Series turbines will be reached via a new access road originating at an unnamed road off of Gold Brook Road. To maintain appropriate grades, the new access road incorporates a switchback design. Location of the new access road is influenced by grade requirements, and has been adjusted to avoid wetland impact to the greatest extent possible. The second A Series access road extends off of Spencer Bale Road. This provides access to the southernmost A Series turbine sites, and can take advantage of more gently sloping terrain in that area.

Access to the B Series is also provided from two locations. Access to the westerly ridgeline of the B Series is provided by a new access road originating from an unnamed road off of Gold Brook Road. Selection of this road location was heavily influenced by the desire to minimize potential wetland impact. Access to the easterly ridgeline of the B Series is a new access road

originating from an unnamed road off of the existing Wahl Road. Again, the design has worked with existing terrain.

Mountaintop roads connecting the turbines must carry the same heavy loads as the access roads, but must also be broad enough for transporting the wide-tracked heavy-lift erection cranes. The crane will be brought to the site dis-assembled, and will be assembled near the first turbine pad. The design assumes that the crane will then travel from one site to the next along the access road as each turbine site is ready. As a practical matter, detailed logistics planning will be incorporated into the construction process and it is likely that "walking" the crane from site to site will occur for clusters of turbine sites; for other sites, it may be more appropriate to take the time for dis-assembling and re-assembling. Under circumstances where the crane is not "walked" between turbine sites, the road travel width will be narrower and impacts decreased beyond what is reflected in the final design. Following construction, only 20 feet of the 34-foot construction road width will be maintained.

Where rock is encountered, ripping or blasting will be utilized. Blasting will be performed safely and efficiently with minimal impact to areas adjacent to the blast sites. The Project's Blasting Plan is provided in Appendix G.

The plans provided in Appendix F reflect specific 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 TransCanada review of similar projects and experience in similar terrain.

Given the hydrology of the site, special design emphasis was placed on handling of surface runoff and subsurface drainage. In general, surface runoff will be handled by maintaining overland flow where possible and re-establishing overland flow (through the use of level spreaders) where concentration of surface runoff is necessary. For subsurface drainage, measures are proposed to maintain subsurface drainage across the construction zone where cuts are occurring in areas of shallow groundwater to reduce the potential for the creation of new seeps or springs. Such measures, outlined on the drawings in Appendix F, include a rock "sandwich" drainage blanket (or mattress), as well as a series of drainage trenches. Typical roadway sections and drainage controls are illustrated in Appendix F, as are erosion control measures.

Based on current information, it is assumed that shallow groundwater exists below elevations 2,700 to 2,800 feet on Series A and below elevations 2,500 to 2,600 feet on Series B. Therefore, the current design reflects subsurface drainage techniques only on the newly proposed access roads. 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 these measures. However, TransCanada will ensure (as discussed in Section 2.4.1) 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 minimally affect 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 these seeps or springs during construction, while cut and fill operations are still on-going, the contractor will use temporary flexible pipe to collect and convey the seeps through the construction site, discharging in a manner not to create a scour/erosion problem downslope. Temporary channels and/or berms and check dams will be used to impound and direct seep drainage to the temporary flexible pipes.

TransCanada will be responsible for the ongoing maintenance of new Project roads. The land owner will continue to maintain the major access roads at the site, i.e., Gold Brook Road, Wahl Road and Spencer Bale Road. The land owner will continue to control access to the site. Security fencing will be limited to the Project substation as is customary for these types of high voltage electrical facilities. It is anticipated that the operation of the wind power facility will not interfere with normal forestry activities.

3.4 Geotechnical Program Implementation

A detailed geotechnical investigation focusing on specific turbine locations, roadways and ancillary facilities will be conducted as an initial element of the construction effort. Appendix H includes a geotechnical report that outlines currently available information and understandings with regard to potential geological and other construction conditions at the site, as well as information regarding the intended geotechnical program to be implemented.

In October 2006, a geological reconnaissance was conducted at the Project site in order to examine geological conditions and obtain samples for subsequent laboratory testing. Six bedrock samples (3 from A Ridge and 3 from B Ridge) were submitted for acid-base accounting tests including: fizz, color, paste pH, Neutralization Potential (NP), total sulfur and sulfur fractionation. Laboratory results indicate that the samples are not considered toxic for either acidity or alkalinity (Appendix H).

An Acid Rock Testing and Mitigation Plan has been developed (Appendix I) to obtain information on the potential for bedrock to generate acid drainage when exposed during construction. The plan focuses the water quality and bedrock testing during future geotechnical investigations and construction activities, and identifies temporary and permanent mitigation measures that could be employed in the event that acid drainage is encountered. Planned testing during geotechnical investigation will provide information that can be used prior to construction to plan for any mitigation measures, if needed.

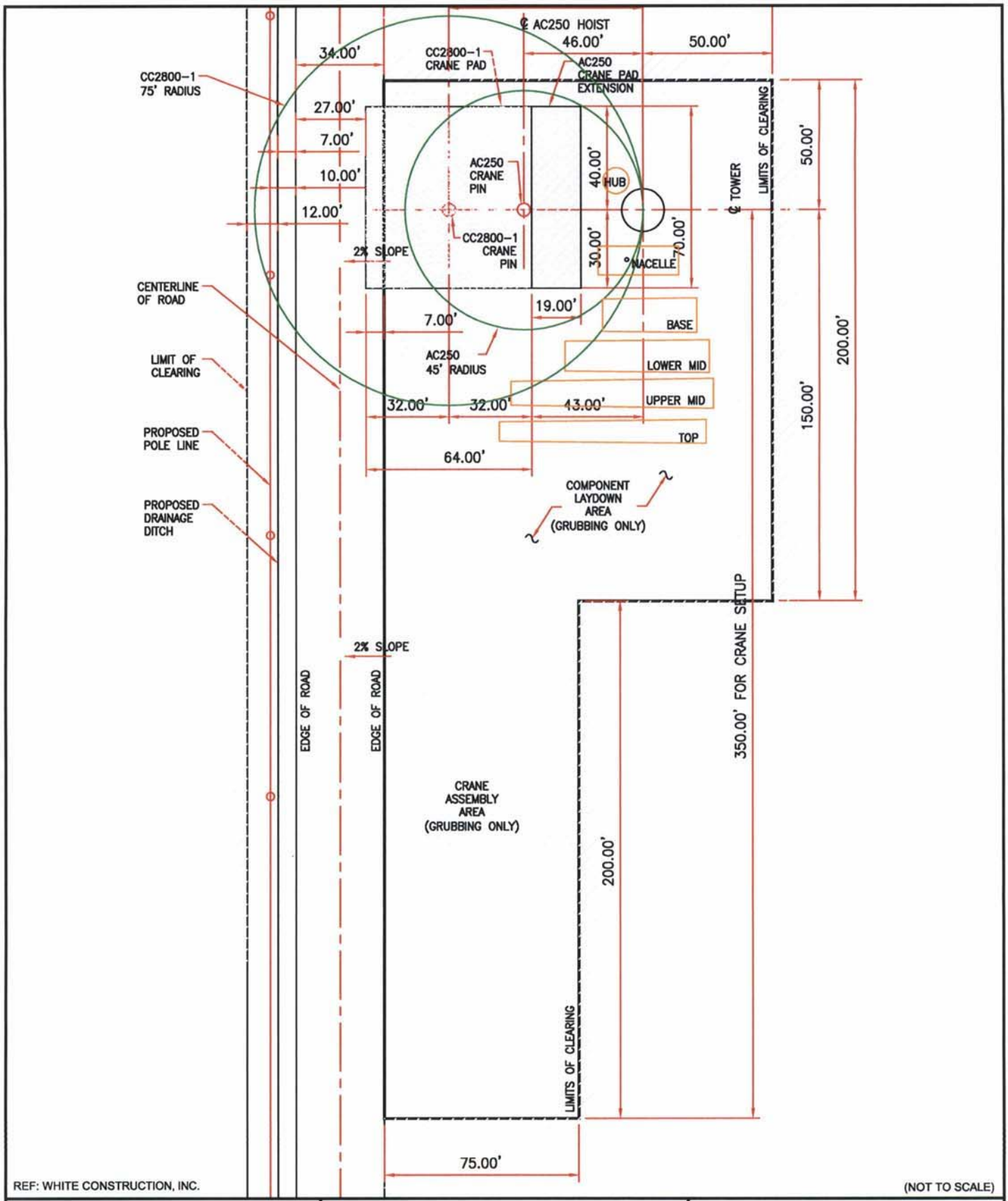
3.5 Turbine Location and Design

The wind turbines locations proposed for the Project are as outlined in the Preliminary Development Plan. Selection of the turbine locations has considered selection of relatively flat ridgeline areas, as well as optimal orientation from a wind resource perspective. As shown in Figure 3-2, a design for each turbine pad and layout has been developed that reflects the maximum surface impact condition. At some turbine locations, the laydown area was re-configured to minimize impact.

Each turbine site will be located in a one-acre cleared area next to the turbine access road. The turbine foundation will be located at one end of the clearing (although a location is specified, the exact position within the turbine pad layout will be a function of site-specific geotechnical testing) and the remainder of the space (approximately 80 percent) will be utilized for equipment and laydown associated with turbine erection. Each turbine pad has been designed to account for a turbine assembly area. In locations where it is determined logistics warrant "walking" the crane from site to site, this additional work space would not be required and area of potential impact would be reduced. Turn-around areas for the transport vehicles have been provided at the terminus of each access road. Where necessary to minimize impact, turn-around areas are provided within the turbine pad footprint.

The design currently assumes the use of a gravity foundation, which requires the most excavation and concrete, in order to represent the most conservative conditions in the design. This foundation type (Figure 3-3) is designed to be installed in existing soils and to hold the wind turbine upright through sheer weight and leverage. Depending upon the site-specific geotechnical conditions at each site, alternative foundation designs (either a socket-type foundation or a rock-anchored foundation, shown in Figures 3-4 and 3-5, respectively) may be used. Either selection would result in impacts comparable to, or less than, those represented in the current final design. The specific foundation type employed at each location will be shown on the final design drawings which are issued for construction. Once the turbine installation is complete, the disturbed areas will be stabilized in accordance with the Erosion and Sedimentation Control Plan (provided in Appendix E), and will be allowed to revegetate.

It is anticipated that four permanent met towers, similar to the lattice-style met towers currently in place at the site, will be installed for ongoing monitoring and management of the wind resource. The specific locations will be selected based on ongoing assessment of wind resource conditions at the site, and they will be positioned as close to the existing disturbance area as possible without being influenced by the operating turbines. Figure 3-6 shows representative locations currently targeted for each permanent met tower. The representative locations have been selected to reflect recommended positioning to capture wind resource information. Refinement of actual locations based on detailed field reconnaissance will be completed prior to their construction in order to balance wind resource requirements with a specific site that avoids natural resource impact and minimizes footprint disturbance. The estimated clearing is incorporated in totals provided in Table 2-2. Foundation requirements will be minimal, and it is anticipated that access will be via all-terrain vehicle (ATV) trails.



REF: WHITE CONSTRUCTION, INC.

(NOT TO SCALE)

Kibby Wind Power Project
Franklin County, Maine

Original: 11-28-06
Revision 1: 12-05-06

Typical Turbine Pad Layout

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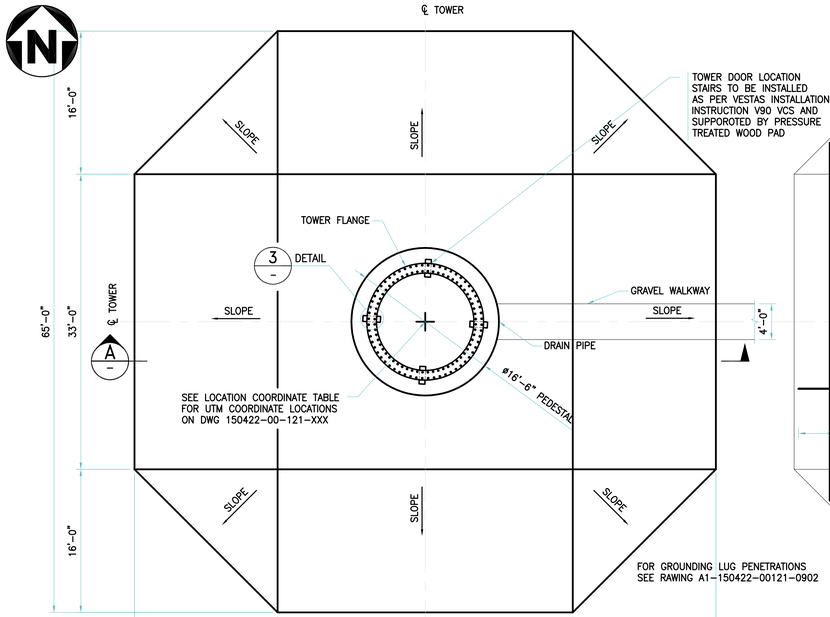
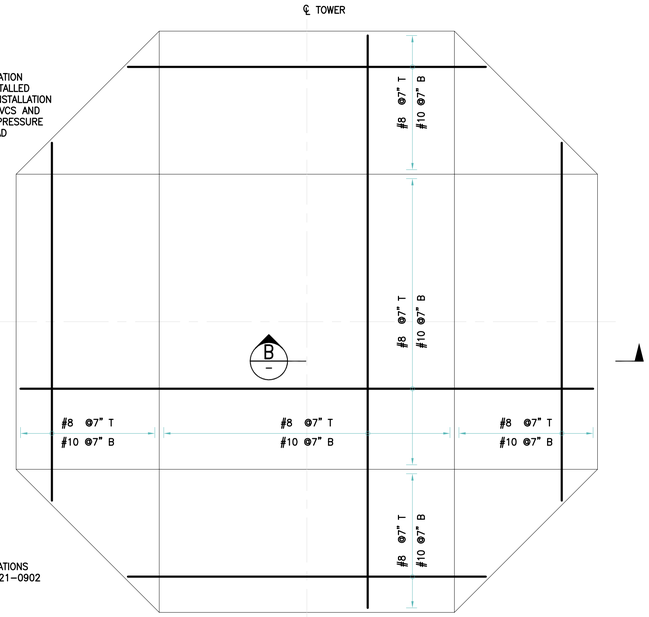
PLYMOUTH MEETING, PA 19462-1308

Figure 3-2



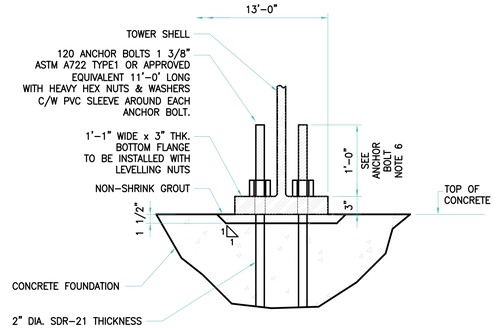
SPREAD FOOTING PLAN

SCALE: 1/8" = 1'-0"



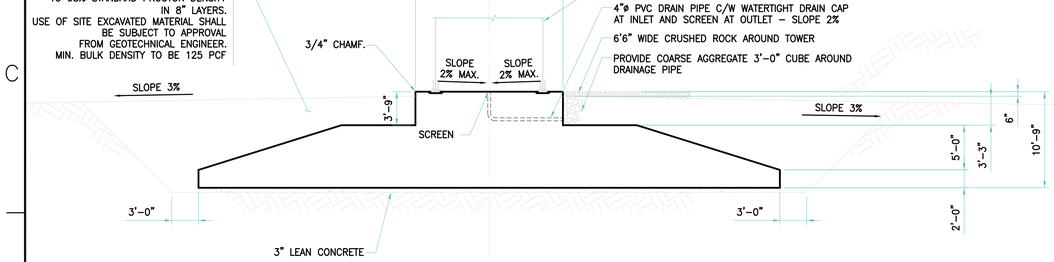
MAIN REINFORCING PLAN

SCALE: 1/8" = 1'-0"



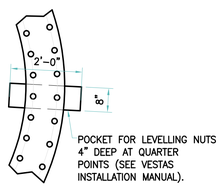
DETAIL 1
1" = 1'-0"

TOWER BOTTOM FLANGE SECTION AT FOUNDATION GROUT

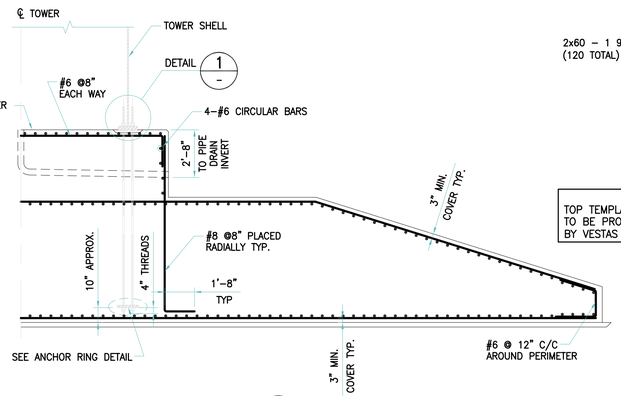


SECTION A

SCALE: 1/8"=1'-0"

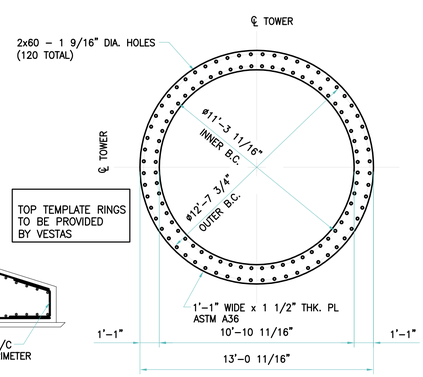


DETAIL 3
SCALE: 1/2"=1'-0"



SECTION B

SCALE: 1/4"=1'-0"



ANCHOR RING 2

SCALE: 1/4"=1'-0"

PRELIMINARY NOT FOR CONSTRUCTION

DESIGN PARAMETERS:

MODEL: VESTAS – V90 VCS–3.0MW
TURBINE HUB HEIGHT: 262'–5"

UNFACTORED LOADS DUE TO EXTREME WIND CONDITION:

OVERTURNING MOMENT:
Mx = 49,077 Ft–K
My = 2321 Ft–K
Mz = 605 Ft–K

HORIZONTAL BASE SHEAR:
Fy = 190 KIPS

VERTICAL TOWER LOAD
Wz = 652 KIPS
FACTOR OF SAFETY FOR NORMAL OPERATION:
OVERTURNING: > 2.0
SLIDING: > 2.0

REFERENCE DOCUMENTS:

VESTAS V90–3.0MW HH80, 1EC 1A FOUNDATION DESIGN REQUIREMENTS.

REPORT OF PRELIMINARY GEOTECHNICAL ENGINEERING EVALUATION KIBBY WIND FARM, FRANKLIN COUNTY, MAINE AMEC PROJECT NO 764970000 PHASE 0006 TASK 100 DATED 28 FEB. 2008 BY AMEC E&E WEXFORD, PA

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN IMPERIAL.
2. READ THIS DRAWING IN CONJUNCTION WITH ALL VESTAS DOCUMENTS RELATED TO THIS PROJECT.

SOIL NOTES:

1. FOUNDING LEVEL OF ALL SPREAD FOOTINGS MUST BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER PRIOR TO PLACING LEAN CONCRETE. FOUNDING LEVEL MUST BE CAPABLE OF SUPPORTING A GROSS BEARING PRESSURE OF AT LEAST 4 KSF. SUBJECT TO CONFIRMATION BY GEOTECHNICAL INVESTIGATION THE EXPOSED SUBGRADE SHALL BE PROOF–ROLLED BY A 10 TON SMOOTH–DRUM ROLLER TO THE APPROVAL OF THE GEOTECHNICAL ENGINEER. SOFT SPOTS, IF ENCOUNTERED, SHALL BE PROPERLY REPAIRED UNDER THE SUPERVISION OF THE GEOTECHNICAL ENGINEER.
2. THE SLOPE OF EXCAVATION SHOULD BE AT A MINIMUM OF 1:1 (HORIZONTAL:VERTICAL) OR FLATTER, IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT (OHSA). FLATTER SLOPE MAY BE REQUIRED IF GROUNDWATER IS ENCOUNTERED.
3. GROUNDWATER, IF ENCOUNTERED, MUST BE DEWATERED TO BELOW THE FOOTING FOUNDING LEVEL SUCH THAT THE NATIVE SUBGRADE WILL NOT BE DILATED OR LOOSENED.
4. IF A FILTERED SUMP IS USED FOR DEWATERING, IT MUST BE LOCATED AT A MINIMUM DISTANCE OF 3'–0" AWAY FROM THE EDGE OF GRANULAR LAYER.
5. DEWATERING MUST BE CONTINUED DURING THE CONSTRUCTION OF THE FOOTING AND, IF NECESSARY, DURING BACKFILLING AND COMPACTING OF SOILS ABOVE THE FOOTING.
6. THE TOP 1'–0" THICK OF THE SOIL LAYER OF THE FINAL GROUND SURFACE SHOULD CONSIST OF COMPACTED CLAYEY/TOP SOIL, OR EQUIVALENT IN ORDER TO REDUCE RAINFALL INFILTRATION. CLAYEY SOIL SHOULD BE USED FOR BACKFILLING THE EXCAVATION. THE FINAL GROUND SURFACE SHOULD BE PROTECTED AGAINST EROSION BY PROVIDING VEGETATIVE COVER OR EQUIVALENT.

CONCRETE NOTES:

1. ALL CONCRETE WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH ACI 318.
2. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4 KSI AT 28 DAYS. SUBMIT CONCRETE MIX DESIGN FOR APPROVAL. MAXIMUM AGGREGATE SIZE SHALL BE 1 1/2", GENERAL USE CEMENT CONFIRM TO ASTM C150, AIR CONTENT 3–6%, SLUMP 4 3/4" ± 1 1/4".
3. NON–SHRINK GROUT SHALL HAVE MINIMUM COMPRESSIVE STRENGTH: 7 KSI @ 3 DAYS
   11 KSI @ 28 DAYS
   SUBMIT MANUFACTURER'S DATA SHEET FOR APPROVAL.
4. REINFORCEMENT SHALL BE NEW DEFORMED STEEL BARS, WITH A YIELD STRESS OF 60 KSI AND CONFORM TO ASTM A615.
5. EXPOSED CORNERS AND EDGES SHALL HAVE 3/4" x 3/4" CHAMFERS UNLESS NOTED OTHERWISE.
6. BENDING, PLACING AND SPLICING OF REINFORCEMENT SHALL CONFORM TO ACI 318 LATEST REVISION.
7. PREPARE AND SUBMIT REBAR PLACING DRAWINGS TO ENGINEER FOR REVIEW BEFORE CONSTRUCTION.
8. CONTRACTOR TO PROVIDE ALL ANCHOR BOLTS, NUTS AND WASHERS, UNLESS NOTED OTHERWISE.

ANCHOR BOLT NOTES:

1. ANCHOR BOLTS SHALL BE UNCOATED HIGH STRENGTH STEEL BARS FOR PRESTRESSING CONCRETE TO ASTM A722 TYPE 1.
2. ANCHOR BOLTS SHALL BE POST TENSION TO 80 KIPS IN A STAR PATTERN AS DESCRIBED IN VESTAS INSTALLATION REFERENCE MANUAL.
3. A PLASTIC BOLT CAP SHOULD BE USED TO PROTECT EXPOSED PORTION OF ANCHOR BOLT FROM CORROSION.
4. THREAD LENGTH IN ANCHOR BOLTS ARE 14" AT TOP AND 4" AT THE BOTTOM.
5. ANCHOR BOLTS SHOULD BE PLACED INSIDE PVC SLEEVE WHICH EXTENDS FROM EMBEDMENT RING TO UNDERSIDE OF TOWER FLANGE. LENGTH OF SLEEVE SHOULD BE VERIFIED BY CONTRACTOR.
6. MINIMUM OF 12" AND MAXIMUM OF 12 1/4" IS REQUIRED ABOVE THE BASE FLANGE TO ACCOMMODATE ANCHOR BOLT STRETCHING TOOL. CONTRACTOR SHALL VERIFY LENGTH OF ANCHOR BOLTS BASED ON THESE REQUIREMENTS.
7. CONTRACTOR TO PROVIDE PROPER MEASURES TO PREVENT WATER PENETRATION INSIDE SLEEVES BEFORE COMPLETION OF TOWER INSTALLATION.

REV	D/M/Y	REVISION	DRN	CHK	APP	APP	APP	APP
C	12/03/08	ISSUED FOR FINAL DEVELOPMENT PLAN	JJ	SL				
B	30/03/06	ISSUED FOR PRELIMINARY	MBH	DA				
A	24/02/06	ISSUED FOR CLIENT REVIEW	MBH	DA				

ISS	D/M/Y	APP	ISSUED FOR
C	12/03/08	SL	FINAL DEVELOPMENT PLAN
B	30/03/06	DA	PRELIMINARY
A	24/02/06	DA	CLIENT REVIEW

REF	NUMBER	TITLE

REFERENCES

PRELIMINARY

STAMP/SEAL

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO.	ACTIVITY NO.	PACKAGE CODE
150422		

SCALE: AS SHOWN

	BY	D/M/Y
DSN.	D.A./S.L.	
DRN.	J.J.	01/27/06

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In business to deliver

AREA 00

SUBJECT

KIBBY WIND POWER PROJECT
SPREAD FOOTING FOR WIND TURBINE GENERATOR – PLAN, SECT. & DETAIL

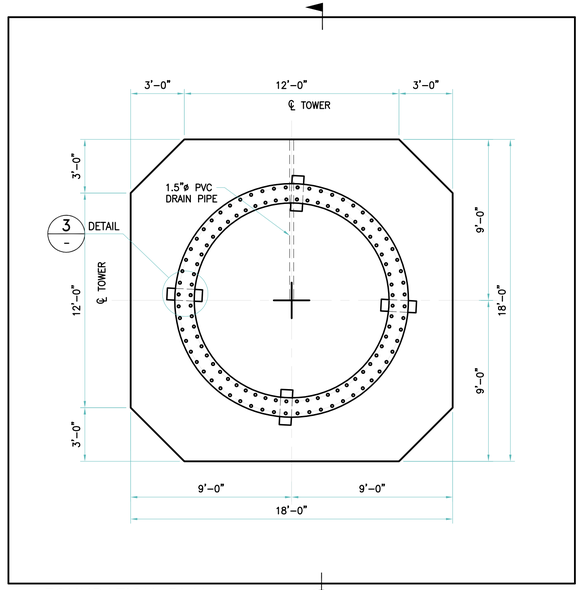
amec

CLIENT DWG. NO.
Figure 3-3

DRAWING NO. D–150422–00–121–0901

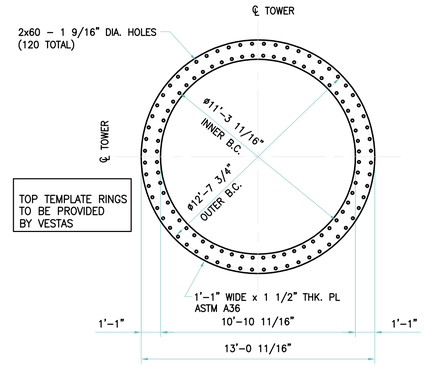
REV. C

CADD FILE ADDRESS
P:\cad\Civ\Sketches\D–150422–00–121–0901



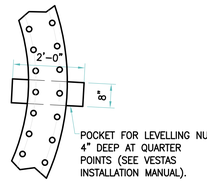
FOUNDATION PLAN

SCALE: 1/4" = 1'-0"



ANCHOR RING

SCALE: 1/4"=1'-0"



DETAIL

SCALE: 1/2"=1'-0"

DESIGN PARAMETERS:

MODEL: VESTAS – V90 VCS–3.0MW
TURBINE HUB HEIGHT: 262'–5"

UNFACTORED LOADS DUE TO EXTREME WIND CONDITION:

OVERTURNING MOMENT:
Mx = 49,077 Ft–K
My = 2321 Ft–K
Mz = 605 Ft–K

HORIZONTAL BASE SHEAR:
Fy = 190 KIPS

VERTICAL TOWER LOAD
Wz = 652 KIPS
FACTOR OF SAFETY FOR NORMAL OPERATION:
OVERTURNING: > 2.0
SLIDING: > 2.0

REFERENCE DOCUMENTS:

VESTAS V90–3.0MW HH80, 1EC 1A FOUNDATION DESIGN REQUIREMENTS.

REPORT OF PRELIMINARY GEOTECHNICAL ENGINEERING EVALUATION KIBBY WIND FARM, FRANKLIN COUNTY, MAINE AMEC PROJECT NO 764970000 PHASE 0006 TASK 100 DATED 28 FEB. 2008 BY AMEC E&E WEXFORD, PA

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN IMPERIAL.
2. READ THIS DRAWING IN CONJUNCTION WITH ALL VESTAS DOCUMENTS RELATED TO THIS PROJECT.

SOIL NOTES:

1. FOUNDATION SHOULD PENETRATE AT LEAST 17'–0" INSIDE SOUND ROCK WITH MINIMUM RQD OF 75%.
2. THE SLOPE OF TOP SOIL EXCAVATION CAN BE AT A MINIMUM OF 1:1 (HORIZONTAL:VERTICAL) OR FLATTER WITH NO GROUNDWATER SEEPAGE. IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT (OHSA). FLATTER SLOPE MAY BE REQUIRED IF GROUNDWATER IS ENCOUNTERED.
3. THE EXCAVATED ROCK FACES MUST BE INSPECTED BY A GEOTECHNICAL ENGINEER PRIOR TO POURING CONCRETE. IF THERE ARE ANY FRACTURES/JOINTS IN THE EXPOSED ROCK FACES. GROUTING MAY BE REQUIRED PRIOR TO POURING CONCRETE. DEEPER/WIDER CONCRETE PLUG WILL BE NECESSARY IF THE EXPOSED ROCK QUALITY IS LESS THAN 75% RQD.

CONCRETE NOTES:

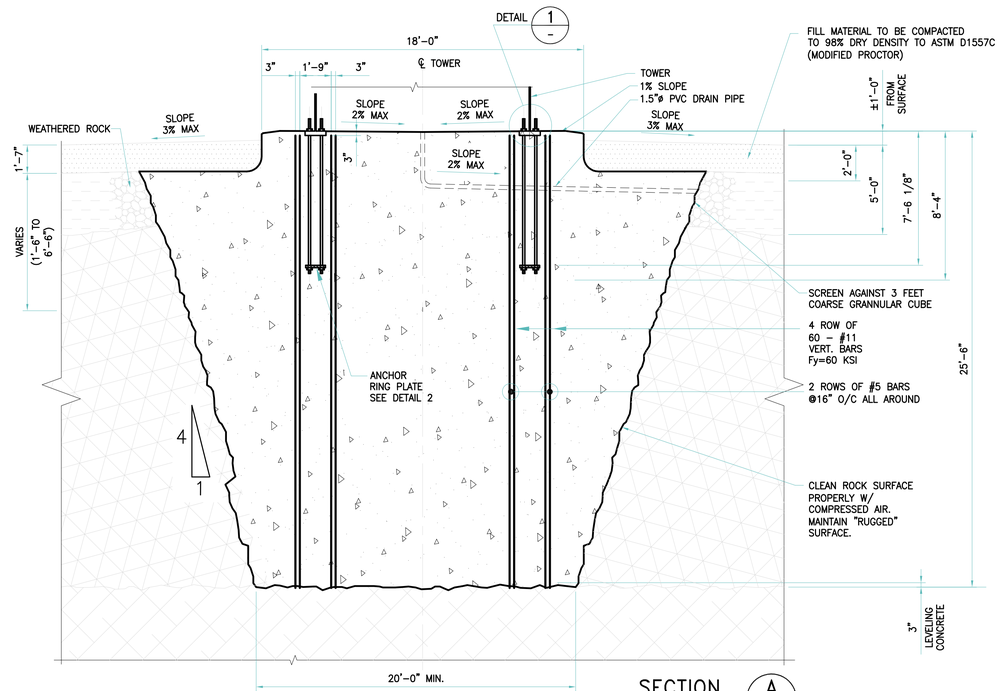
1. ALL CONCRETE WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH ACI 318.
2. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS IN ACCORDANCE WITH ACI 318 SPECIFICATION, UNLESS NOTED OTHERWISE. SUBMIT CONCRETE MIX DESIGN FOR APPROVAL.
3. GROUT SHALL BE NON SHRINK CEMENTITOUS AND HAVE MINIMUM COMPRESSIVE STRENGTH:
   6000 PSI @ 3 DAYS
   8000 PSI @ 28 DAYS
4. REINFORCEMENT SHALL BE NEW DEFORMED STEEL BARS, WITH A YIELD STRESS OF 60 KSI.
5. CONTRACTOR TO PROVIDE ALL ANCHOR BOLTS, NUTS AND WASHERS, UNLESS NOTED OTHERWISE.
6. HEAT EXCAVATION A MINIMUM OF 24 HOURS BEFORE POURING CONCRETE. TEMPERATURE TO BE ABOVE 5°C.
7. NO CONSTRUCTION JOINT IS PERMITTED UNDER PRIOR APPROVAL BY DESIGN ENGINEER.

ANCHOR BOLT NOTES:

1. ANCHOR BOLTS SHALL BE UNCOATED HIGH STRENGTH STEEL BARS FOR PRESTRESSING CONCRETE TO ASTM A722 TYPE 1.
2. ANCHOR BOLTS SHALL BE PRETENSIONED TO 73 KIPS IN A STAR PATTERN AS DESCRIBED IN VESTAS INSTALLATION REFERENCE MANUAL.
3. A PLASTIC BOLT CAP SHOULD BE USED TO PROTECT EXPOSED PORTION OF ANCHOR BOLT FROM CORROSION.
4. THREAD LENGTH IN ANCHOR BOLTS ARE 14" AT TOP AND 4" AT THE BOTTOM.
5. ANCHOR BOLTS SHOULD BE PLACED INSIDE PVC SLEEVE WHICH EXTENDS FROM EMBEDMENT RING TO UNDERSIDE OF TOWER FLANGE. LENGTH OF SLEEVE SHOULD BE VERIFIED BY CONTRACTOR.
6. MINIMUM OF 12" AND MAXIMUM OF 12 1/4" IS REQUIRED ABOVE THE BASE FLANGE TO ACCOMMODATE ANCHOR BOLT STRETCHING TOOL. CONTRACTOR SHALL VERIFY LENGTH OF ANCHOR BOLTS BASED ON THESE REQUIREMENTS.
7. CONTRACTOR TO PROVIDE PROPER MEASURES TO PREVENT WATER PENETRATION INSIDE SLEEVES BEFORE COMPLETION OF TOWER INSTALLATION.

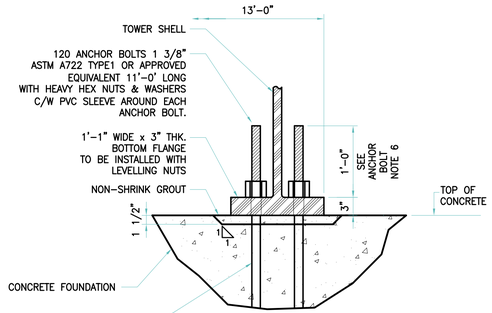
REFERENCE:

REPORT OF PRELIMINARY GEOTECHNICAL ENGINEERING EVALUATION KIBBY WIND FARM, FRANKLIN COUNTY, MAINE AMEC PROJECT NO 764970000 PHASE 0006 TASK 100 DATED 28 FEB. 2008 BY AMEC E&E WEXFORD, PA



SECTION A

SCALE: 1/4"=1'-0"



DETAIL 1

1" = 1'-0"

TOWER BOTTOM FLANGE
SECTION AT FOUNDATION GROUT

PRELIMINARY NOT FOR CONSTRUCTION

REV	D/M/Y	REVISION	DRN	CHK	APP	APP	APP	APP
C	13/03/08	ISSUED FOR FINAL DEVELOPMENT	JJ	SL				
B	30/03/06	ISSUED FOR PRELIMINARY	MBH	DA				
A	24/02/06	ISSUED FOR CLIENT REVIEW	MBH	DA				

ISS	D/M/Y	APP	ISSUED FOR
C	13/03/08	SL	FINAL DEVELOPMENT PLAN
B	30/03/06	DA	PRELIMINARY
A	24/02/06	DA	CLIENT REVIEW

REF	NUMBER	TITLE

REFERENCES

PRELIMINARY

STAMP/SEAL

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

AREA 00

PROJECT NO. 150422

ACTIVITY NO.

PACKAGE CODE

SCALE AS SHOWN

	BY	D/M/Y
DSN.	D.A./S.L.	
DRN.	J.J.	13/03/08

SUBJECT

KIBBY WIND POWER PROJECT
FOUNDATION FOR WIND TURBINE
GENERATOR – PLAN & SECTION

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CLIENT DWG. NO.

Figure 3-4

DRAWING NO. D–150422–00–121–0902

REV. C

CADD FILE ADDRESS
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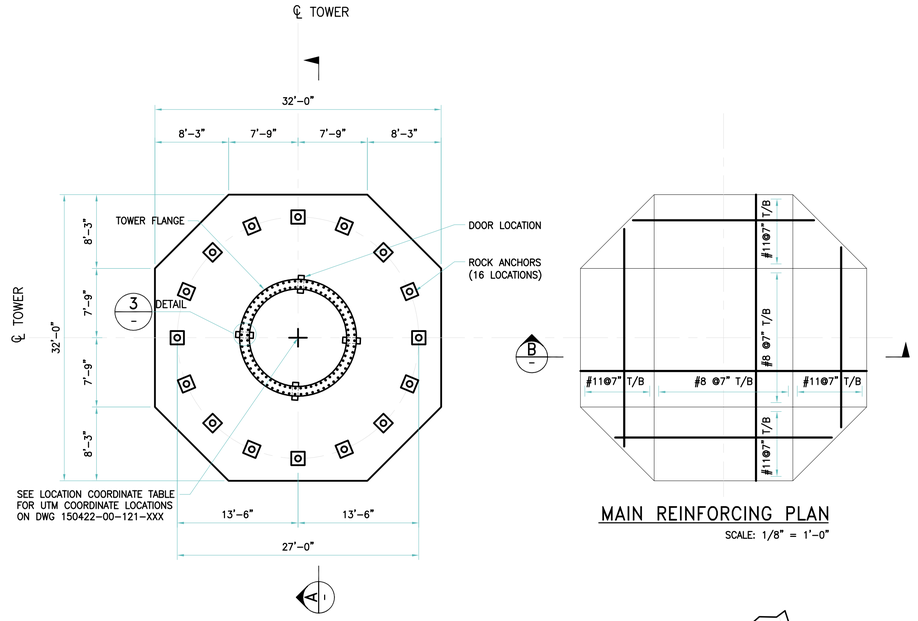
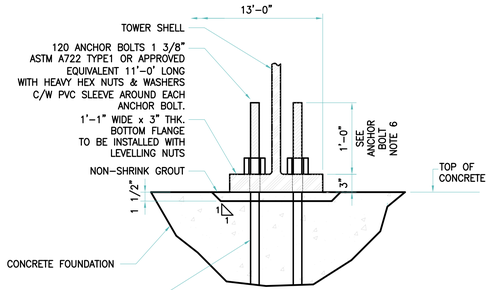


FOUNDATION PLAN

SCALE: 1/8" = 1'-0"

MAIN REINFORCING PLAN

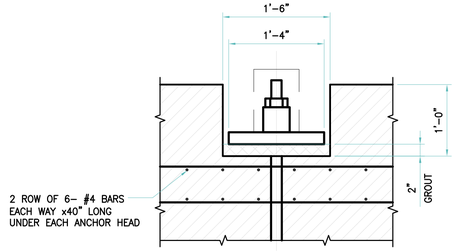
SCALE: 1/8" = 1'-0"



DETAIL 1

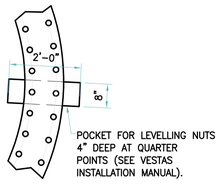
1" = 1'-0"

TOWER BOTTOM FLANGE SECTION AT FOUNDATION GROUT



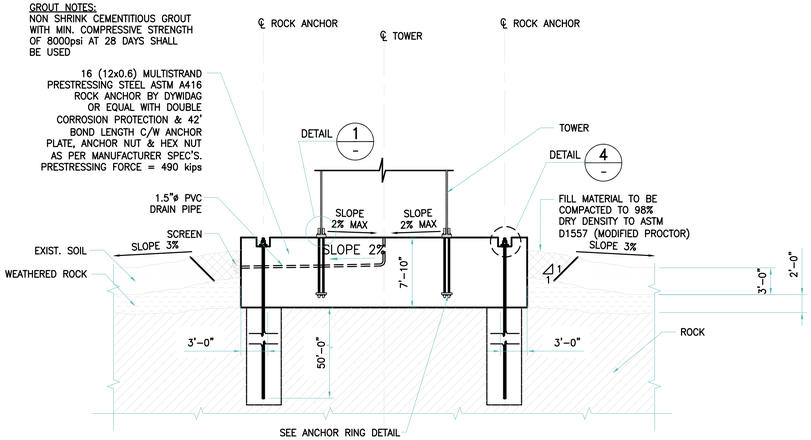
DETAIL 4

1" = 1'-0"



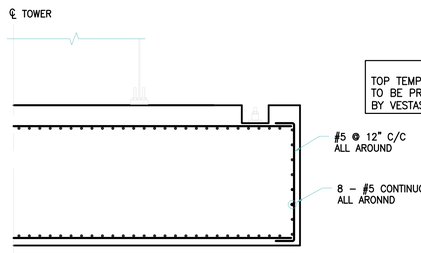
DETAIL 3

SCALE: 1/2"=1'-0"



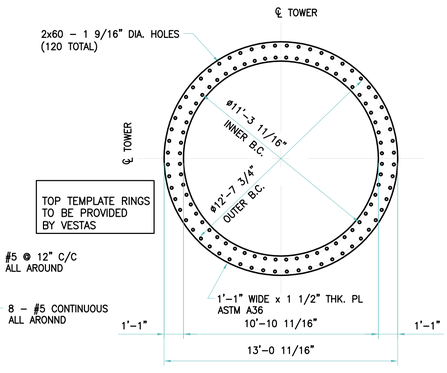
SECTION A

SCALE: 1/8"=1'-0"



SECTION B

SCALE: 1/4"=1'-0"



ANCHOR RING 2

SCALE: 1/4"=1'-0"

DESIGN PARAMETERS:

MODEL: VESTAS – V90 VCS-3.0MW
TURBINE HUB HEIGHT: 262'-5"

UNFACTORED LOADS DUE TO EXTREME WIND CONDITION:

OVERTURNING MOMENT:
Mx = 49,077 Ft-K
My = 2321 Ft-K
Mz = 605 Ft-K

HORIZONTAL BASE SHEAR:
Fy = 190 KIPS

VERTICAL TOWER LOAD
Wz = 652 KIPS
FACTOR OF SAFETY FOR NORMAL OPERATION:
OVERTURNING: > 2.0
SLIDING: > 2.0

REFERENCE DOCUMENTS:

VESTAS V90-3.0MW HH80, 1EC 1A FOUNDATION DESIGN REQUIREMENTS.

REPORT OF PRELIMINARY GEOTECHNICAL ENGINEERING EVALUATION KIBBY WIND FARM, FRANKLIN COUNTY, MAINE AMEC PROJECT NO 764970000 PHASE 0006 TASK 100 DATED 28 FEB. 2008 BY AMEC E&E WEXFORD, PA

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN IMPERIAL.
2. READ THIS DRAWING IN CONJUNCTION WITH ALL VESTAS DOCUMENTS RELATED TO THIS PROJECT.

SOIL NOTES:

1. FOUNDATION SHOULD BE CONSTRUCTED OVER SOUND ROCK WITH MINIMUM RQD OF 75%.
2. THE SLOPE OF SOIL EXCAVATION SHOULD BE AT A MINIMUM OF 1:1 (HORIZONTAL:VERTICAL) OR FLATTER WITH NO GROUND WATER SEEPAGE, IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT (OHSA). FLATTER SLOPE MAY BE REQUIRED IF GROUNDWATER IS ENCOUNTERED.
3. THE CAPACITY OF THE ROCK ANCHOR MUST BE VERIFIED BY FIELD TESTING AND APPROVED BY A GEOTECHNICAL ENGINEER. THE ROCK ANCHOR SHOULD HAVE A MINIMUM ULTIMATE CAPACITY OF 700 kips.

CONCRETE NOTES:

1. ALL CONCRETE WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH ACI 318.
2. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4 KSI AT 28 DAYS. SUBMIT CONCRETE MIX DESIGN FOR APPROVAL. MAXIMUM AGGREGATE SIZE SHALL BE 1 1/2", GENERAL USE CEMENT CONFIRM TO ASTM C150, AIR CONTENT 3-6%, SLUMP 4 3/4" ± 1 1/4".
3. NON-SHRINK GROUT SHALL HAVE MINIMUM COMPRESSIVE STRENGTH: 7 KSI @ 3 DAYS
   11 KSI @ 28 DAYS
   SUBMIT MANUFACTURER'S DATA SHEET FOR APPROVAL.
4. REINFORCEMENT SHALL BE NEW DEFORMED STEEL BARS, WITH A YIELD STRESS OF 60 KSI AND CONFORM TO ASTM A615.
5. EXPOSED CORNERS AND EDGES SHALL HAVE 3/4" x 3/4" CHAMFERS UNLESS NOTED OTHERWISE.
6. BENDING, PLACING AND SPLICING OF REINFORCEMENT SHALL CONFORM TO ACI 318 LATEST REVISION.
7. PREPARE AND SUBMIT REBAR PLACING DRAWINGS TO ENGINEER FOR REVIEW BEFORE CONSTRUCTION.
8. CONTRACTOR TO PROVIDE ALL ANCHOR BOLTS, NUTS AND WASHERS, UNLESS NOTED OTHERWISE.

ROCK ANCHOR NOTES:

1. ROCK SHOULD BE GROUTED PRIOR TO STRESSING ANCHORS.
2. ROCK ANCHORS SHOULD FORFORM TO ASTM A416.
3. DIAMETER OF THE HOLES IN THE ROCK MAY VARY FROM 6" TO 7" BASED ON ROCK CONDITION AND MANUFACTURER REQUIREMENTS.

ANCHOR BOLT NOTES:

1. ANCHOR BOLTS SHALL BE UNCOATED HIGH STRENGTH STEEL BARS FOR PRESTRESSING CONCRETE TO ASTM A722 TYPE 1.
2. ANCHOR BOLTS SHALL BE PRETENSIONED TO 73 KIPS IN A STAR PATTERN AS DESCRIBED IN VESTAS INSTALLATION REFERENCE MANUAL.
3. A PLASTIC BOLT CAP SHOULD BE USED TO PROTECT EXPOSED PORTION OF ANCHOR BOLT FROM CORROSION.
4. THREAD LENGTH IN ANCHOR BOLTS ARE 14" AT TOP AND 4" AT THE BOTTOM.
5. ANCHOR BOLTS SHOULD BE PLACED INSIDE PVC SLEEVE WHICH EXTENDS FROM EMBEDMENT RING TO UNDERSIDE OF TOWER FLANGE. LENGTH OF SLEEVE SHOULD BE VERIFIED BY CONTRACTOR.
6. MINIMUM OF 12" AND MAXIMUM OF 12 1/4" IS REQUIRED ABOVE THE BASE FLANGE TO ACCOMMODATE ANCHOR BOLT STRETCHING TOOL. CONTRACTOR SHALL VERIFY LENGTH OF ANCHOR BOLTS BASED ON THESE REQUIREMENTS.
7. CONTRACTOR TO PROVIDE PROPER MEASURES TO PREVENT WATER PENETRATION INSIDE SLEEVES BEFORE COMPLETION OF TOWER INSTALLATION.

PRELIMINARY NOT FOR CONSTRUCTION

REV	D/M/Y	REVISION	DRN	CHK	APP	APP	APP	APP
C	13/03/08	ISSUED FOR FINAL DEVELOPMENT PLAN	JJ	SL				
B	30/03/06	ISSUED FOR PRELIMINARY	MBH	DA				
A	24/02/06	ISSUED FOR CLIENT REVIEW	MBH	DA				

ISS	D/M/Y	APP	ISSUED FOR
C	13/03/08	SL	FINAL DEVELOPMENT PLAN
B	30/03/06	DA	PRELIMINARY
A	24/02/06	DA	CLIENT REVIEW

REF	NUMBER	TITLE

REFERENCES

PRELIMINARY

STAMP/SEAL

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE

PROJECT NO. 150422

ACTIVITY NO.

PACKAGE CODE

SCALE NTS

	BY	D/M/Y
DSN.	D.A./S.L.	
DRN.	J.J.	13/03/08

TransCanada — In business to deliver

AREA 00

SUBJECT: KIBBY WIND POWER PROJECT
ROCK ANCHOR OPTION FOR WIND
TURBINE GEN. – PLAN & SECTION

amec

CLIENT DWG. NO. Figure 3-5

DRAWING NO. D-150422-00-121-0905

REV. C

CADD FILE ADDRESS
P:\cad\Civ\Sketches\D-150422-00-121-0905

1 inch equals 2,250 feet

0 0.25 0.5 1 Miles

1236000 1242000 1248000

16492000 16486000 16480000 16474000

Representative Location - Permanent Met Tower 1

Representative Location - Permanent Met Tower 2

Representative Location - Permanent Met Tower 3

Representative Location - Permanent Met Tower 4

A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A18 A19

B1 B2 B3 B4 B5 B7 B8 B9 B10 B11 B12 B13 B15 B17 B18 B19 B20 B21 B22 B23 B24 B25 B26 B27 B28

T1 R6 WBKP

KIBBY

STREAM

Middle Br

East Br

LEGEND

- Turbine Locations (LURC)
- Permanent Met Tower (Representative Locations)
- Turbine Access Roads
- LURC PMA Zone
- Rezoned Area

Revision 1
Date: 04/10/08

FIGURE 3-6

Permanent Met Tower Locations Kibby Wind Power Project Franklin County, Maine

Notes:
1. This map supercedes all previous maps. Site boundaries and surface features are approximate only and are subject to location by an actual field survey.
2. Coordinate system:UTM NAD83 Zone 19 Feet

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Wexford, Pennsylvania 15090

3.6 Anticipated Cut and Fill

The clearing and grading areas shown on the Final Development Plans for the roads and turbine pad locations conservatively indicated the maximum areas requiring alteration, allowing for further optimization as the construction process progresses. Table 3-3 outlines anticipated cut and fill volumes. No other Project elements involve significant amounts of earth movement.

Table 3-3: Estimated Cut and Fill Calculations (cubic yards)

Project Component	Cut	Fill	***Net***
Access Roads and Collector System	522,390	1,209,375	*686,985*
Turbine Pads	*400,430*	*131,135*	*269,295*

Note: Quantities stated are net in place and exclude bulking factors.

For initial road improvements, materials will be purchased or obtained from on-site excavation areas associated with construction of new roads and turbine foundations. Excavated rock from the new construction will be crushed and re-used for the roads and work areas. Based on cut and fill estimates, more fill will be required and it is anticipated that any suitable soil and rock material excavated onsite will be used. Provisions have been made for storage of excess materials. Organic material removed during construction will be re-used in preparing erosion control material. Four disposal areas have been identified for the disposal of unsuitable soil and rock material (shown on Figure 3-1). Disposal of this excess rock and inert fill will be in accordance with the Filling and Grading Standards of Chapter 10. Although four locations (totalling approximately 20 acres) have been identified, significantly less area may be required and such areas will not be prepared and used unless needed; the Project construction effort will balance cut and fill to the maximum extent possible.

3.7 Post-Construction Revegetation

Stabilization and revegetation measures, as outlined in Appendix J, will be implemented such that areas around the turbine pads and roads will be allowed to revegetate. Steeper graded slopes and channels will be stabilized using means other than exclusively vegetation, including rock, erosion control mix, and vegetation reinforced with matting.

4.0 ELECTRICAL COLLECTOR SYSTEM

Collector system design drawings are presented in Appendix K. The purpose of the 34.5 kV electrical collection system is to interconnect the individual turbines to a single collector power line. The A Series and B Series collector systems will each deliver the gathered electricity to the proposed Kibby Substation, located on Wahl Road, via collector lines from the ridgelines to the substation. The Series A collector system will extend from the southerly portion of the ridgeline at Spencer Bale Road through recently cut areas, crossing Hurricane Road, Kibby Stream, and Wahl Road to access the Kibby Substation on the south side of Wahl Road. For Series B, the collector system will extend from the southeasterly portion of the ridgeline through recently cut areas, to co-locate briefly with the proposed 115 kV transmission corridor before connecting to the Kibby Substation.

Collector lines will be buried from the turbine base through the turbine pad area to the edge of the road where they will connect above grade to the pole line system between the turbines. For each ridgeline series, the collection system will consist of two 34.5 kV, three-phase cable systems on overhead poles along the ridgeline roadways except where excessive curves require divergence. The 34.5 kV system will extend on above-ground poles along the ridgeline road corridor, within the road shoulder. As the collector system leaves the ridgeline roadways to extend overland towards the Kibby Substation, each Series will require one 60 foot wide cleared right-of-way (20 feet maintained). Following construction, the right-of-way will be allowed to revegetate with low-growing species, as detailed in the Vegetation Management Plan (Appendix J). Maintenance of this cleared right-of-way will be performed by crews on foot and using ATVs. Along with the three-phase electrical transmission wires, fiber optic communication cabling for the System Control and Data Acquisition (SCADA) system that controls, monitors, and collects performance data from each turbine will be strung on the same poles.

A significant amount of the electrical collector system (on the ridgeline) is located within the D-PD zone. As the collector lines extend down the mountains toward Kibby Substation, they enter the M-GN zone. The collector lines also traverse, in limited areas, P-SL2, P-WL1 and P-WL2 overlay zones. The collector system is a utility facility as defined under LURC regulations, Chapter 10.02 (193) (definition of utility facility), which is an allowed use requiring a permit or by special exception in all applicable subdistricts. Chapter 10.22(A)(3)(c)(27) (M-GN subdistrict), 10.23(G)(3)(d)(5) (P-MA subdistrict), 10.23(L)(3)(c)(19) (P-SL subdistrict), and 10.23(N)(3)(d)(6) (P-WL subdistrict). As set forth in the Preliminary Development Plan Application at Section 2.4.3.3 and Sections 4 and 11 of the FDP application, these facilities have been located to minimize environmental impacts and there is no alternative site suitable for the location of these facilities that will have less of an environmental impact. Similarly, as set forth in the Preliminary Development Plan Application and Sections 9.3 (Erosion and Sedimentation Control Plan) and 9.4 (Vegetation Management Plan) of the FDP application, the proposed construction and maintenance procedures will ensure adequate buffering of these facilities from other potentially incompatible uses and resources.

5.0 KIBBY SUBSTATION

Substation design drawings are provided in Appendix L. The Kibby Substation will be located along Wahl Road and will consist of a 110- by 220-foot (24,200 square foot or 0.56 acre) fenced area. The surrounding tree cover will provide visual screening of the substation. Additional native evergreen plantings will be provided to balance visual aesthetics, safety and security. Stormwater management will be through the use of vegetated drainage swales and sheet flow into undisturbed upland buffer area. The substation will be sited to meet all applicable road, property boundary, and natural resource setbacks.

The Kibby Substation will contain the main 34.5 kV-to-115 kV step-up transformers, grounding systems, and connection points for the incoming and outgoing power lines. A weather-protected substation building inside the substation will contain switchgear, station service, SCADA, protection and communication equipment. Capacitor banks, and D-Var equipment will also be located within the substation fenced area. Election power in the substation will be provided from the 34.4 kV bus via a dry-type transformer, which will be mounted in the 34.5 kV switchgear. No other utilities or services are required at this location.

Perimeter lighting and equipment lighting will be provided at the substation, but will normally be shut off. The lighting will be set up to be turned on manually or by motion sensors to allow for emergency inspection or repair. Portable generators and lights will be used for lighting in difficult areas.

The substation will have an entry access road for maintenance vehicles and equipment installation and removal. Metallic wire fencing with 3-strand barb wire will be installed for prevention of unauthorized access. The substation building will have heating, ventilation and air conditioning (HVAC) as required for operation of equipment contained in the building. Electric heat will be utilized in the control house and equipment cabinets to maintain temperature within equipment operating limits and to provide a safe working environment.

The Kibby Substation is located in the M-GN subdistrict and is an allowed use requiring a permit pursuant to Chapter 10.22(A)(3)(c)(27),(29) and (30).

6.0 OPERATION AND MAINTENANCE BUILDING

O&M Building design drawings are provided in Appendix M. The Project will include an approximately 3,600 square foot building located on an approximately 1-acre lot at the corner of Route 27 and Gold Brook Road (the location of the construction control center). Access to the O&M Building will be off of Gold Brook Road. The O&M Building will be used to securely store tools and associated material necessary for the maintenance of the Project (cleaning oils, greases, lubricants, products, etc.), a company vehicle, as well as spare parts for the wind turbines and associated equipment. The building will also house the Project control center, and will function as an office for the Project's operational management. As such, communications equipment and a potable groundwater well and septic system for sanitary purposes have been incorporated into the final design of the O&M Building. Table 6-1 provides an estimate of sanitary system requirements. Soil suitability and mapping to identify a suitable area for the on-site septic system are provided in Appendix N.

Table 6-1: Estimated Sanitary System Requirements

Building	Number of People	Total Sanitary System Requirements (gpd)
Construction Control Center and Parking (temporary during construction)	150	2,250
O&M Building Area	15	225
Potential Concrete Batch Plant and Material Handling Storage Area	NA	NA

[1] Water Use/Person of 15 gallons per day (gpd) is based on the design flow for employees at place of employment with no shower listed in Table 501.2- Design flow for other facilities in Chapter 5 of the Maine Subsurface Waste Water Disposal Rules 10-144 CMR 24

Table 6-2 estimates water requirements for the Project. Appendix O includes a letter from a local hydrogeologist confirming that sufficient and healthful water supply is likely to be available, as required by LURC.

Table 6-2: Estimated Water Use Requirements

Building	Number of People	Sanitary Water Use/Person (gpd) [1]	Total Potable Water Use (gpd)	Estimated Daily Water Use (gallons) [2]	Estimated Well Yield Required (gpm) [2]
Construction Control Center and Parking	150	15	2,250	2,250	5
Service Building Area	15	15	225	225	1
Potential Concrete Batch Plant and Material Handling Storage Area [(3)]	N/A	N/A	N/A	28,000[3]	60

[1] Water Use/Person of 15 gallons per day (gpd) is based on the design flow for employees at place of employment with no shower.

[2] Numbers were rounded up to the nearest whole number; gpm = gallons per minute.

[3] Assumes 700 cubic yards of concrete required per day for gravity foundations and 40 gallons of water is required per cubic yard of concrete. Assumes that one foundation will be installed per day. A gravity foundation has the highest water use of foundation types under consideration. Note that this is the worst case, as it is anticipated that a socket foundation will be used, requiring 400 cubic yards per day during construction.

Additional potential water needs for dust control and other miscellaneous construction purposes are assumed to be able to be accommodated by the proposed well and/or other permitted water supply sources.

Perimeter and building lighting have been incorporated into the final design of the service building. All pole-mounted lighting will be no higher than 20 feet tall and all lighting will be shielded so as to provide downward directivity and avoid nighttime glare. Exterior lighting will be motion sensitive or manually controlled. Emergency lighting, with backup power supply has also been incorporated into the final design to ensure safe and reliable facility operation.

The O&M Building will be heated by a propane boiler. There will be no floor drains in the garage. Electricity will be supplied by an overhead line from the Kibby Substation, with a propane-fired generator as backup. Parking will be in an unpaved gravel area proximate to the building. Landscaping will occur along the site access road/driveway, in addition to plantings along the building entryway.

It should be noted that a portion of the grounds may be set aside for temporary storage of turbine components for maintenance activities. This area will be appropriately secured and visually screened.

The O&M Building is located in the M-GN subdistrict and is an allowed use requiring a permit pursuant to Chapter 10.22(A)(3)(c)(26),(27), (29) and (30).

7.0 115 KV ELECTRIC TRANSMISSION LINE

Design drawings for the 115 kV electric transmission line are provided in Appendix P. The 115 kV transmission corridor extends from the new Kibby Substation to the existing Bigelow Substation in Carrabassett Valley. From Kibby Substation, it extends through Kibby Township, Jim Pond Township, the town of Eustis, Coplin Plantation, Wyman Township, and the town of Carrabassett Valley. Of the total 27.6 miles, approximately 17.8 miles are located within LURC jurisdiction. The remainder, located within incorporated townships (Eustis and Carrabassett Valley), is permitted by DEP.

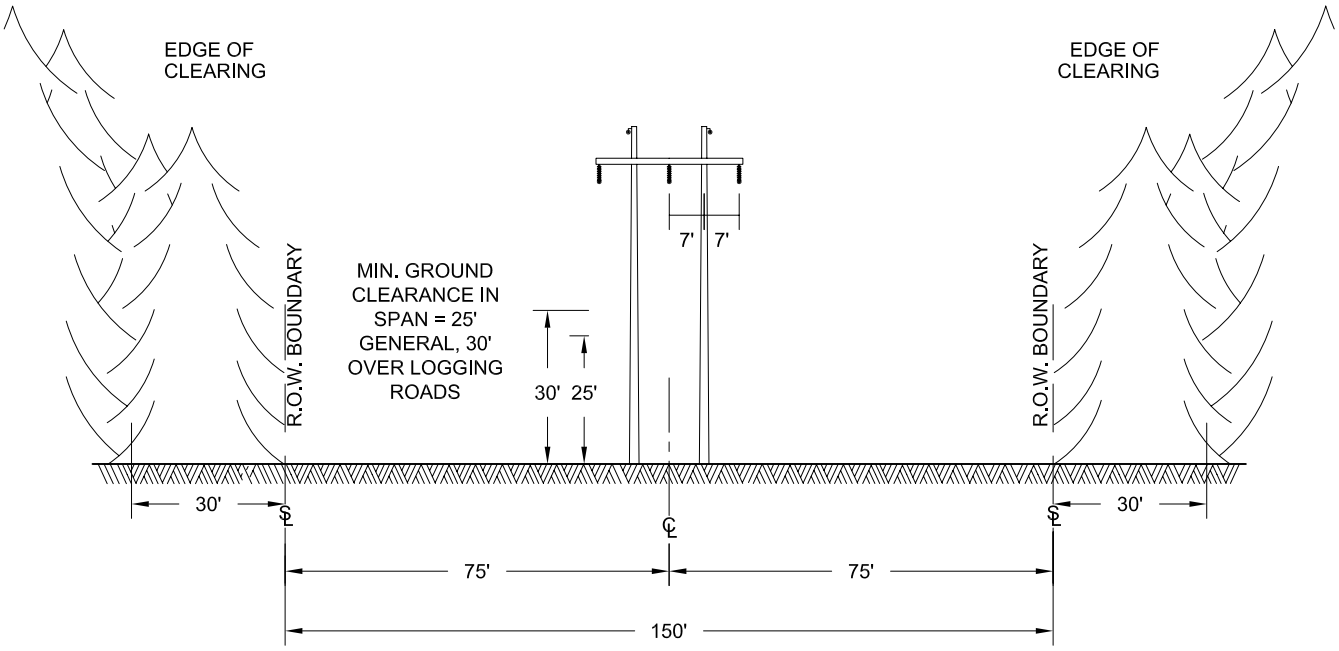
Major components of the proposed 115 kV transmission line include cleared right-of-way, pole structures, conductor (wire), insulators, guy wires and anchors, and a short underground segment of line in Wyman Township. Access to the right-of-way will be provided by existing roads and trails. During construction, staging areas will be within existing cleared areas that have been recently used by the MDOT for Route 27 construction staging.

The majority of the proposed line route will require a new right-of-way, from its origin at the Kibby Substation in Kibby Township to Mile 21.75 in Coplin Plantation. The area through which the proposed transmission line will extend is currently managed as working forest. In order to accommodate the proposed Project transmission line, a right-of-way width of 150 feet will be cleared through forest (Figure 7-1A). From Mile 21.75 to the furthest extent within LURC jurisdiction, the proposed transmission line corridor is adjacent and to the north of an existing 150-foot-wide transmission line right-of-way. From this point to Mile 26.5, the proposed right-of-way width is 125 feet, with H-frame transmission structures (Figures 7-2 and 7-3). From Mile 26.5 to Route 27, where the line will go underground, a single-pole design will be used (Figure 7-4) and the width of clearing will be reduced to 100 feet (Figure 7-1B). Because the poles can be installed with minimal ground disturbance, little impact beyond the necessary clearing is anticipated to result from the proposed 115 kV transmission line right-of-way.

The 115 kV electric transmission line crosses the following subdistricts in LURC jurisdiction: M-GN, P-SL, P-WL, and P-UA. The transmission line is a utility facility under LURC regulations, Chapter 10.02(193) (definition of utility facility), and is an allowed use requiring a permit or by special exception in all applicable subdistricts. Chapter 10.22(A)(3)(c)(27) (M-GN subdistrict), 10.23(L)(3)(c)(19) (P-SL subdistrict), 10.23(M)(3)(d)(6) (P-UA subdistrict), and 10.23(N)(3)(d)(6) (P-WL subdistrict). As set forth in the Preliminary Development Plan Application at V-3.0 and Sections 7 and 11 of the FDP application, these facilities have been located to minimize environmental impacts and there is no alternative site suitable for the location of these facilities that will have less of an environmental impact. Similarly, as set forth in the Preliminary Development Plan Application at V-3.0 and Sections 9.3 (Erosion and Sedimentation Control Plan) and 9.4 (Vegetation Management Plan) of the FDP application, the proposed construction and maintenance procedures will ensure adequate buffering of these facilities from other potentially incompatible uses and resources.

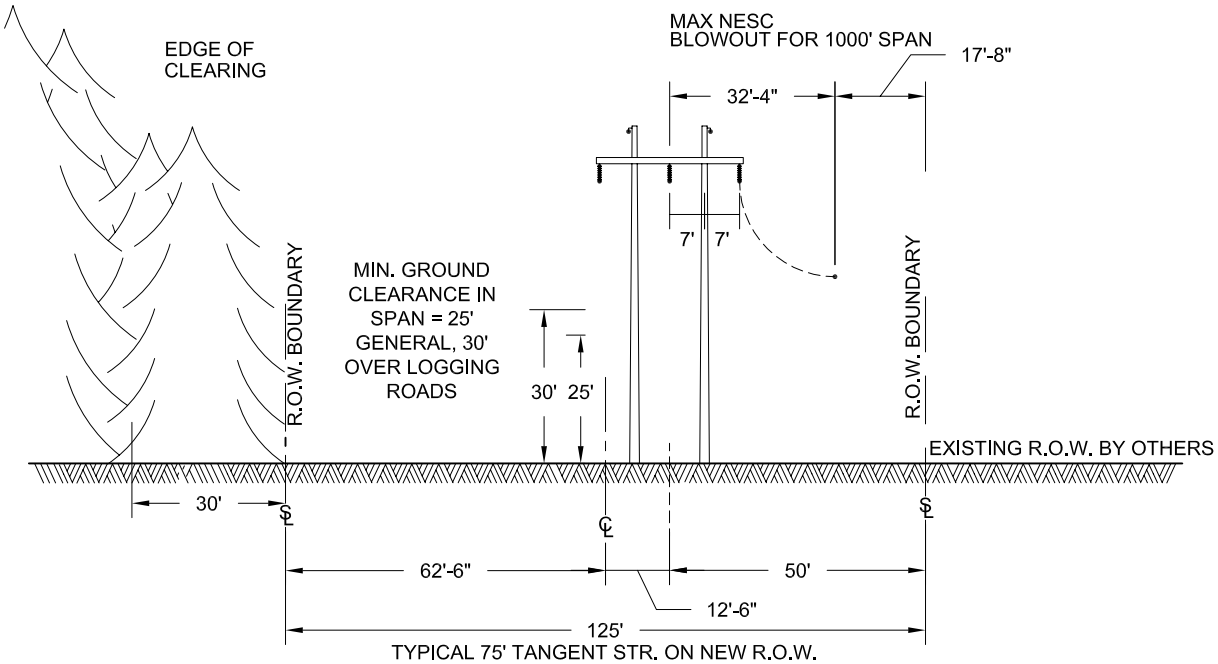
PROPOSED R.O.W.

CROSS SECTION VIEW #1



TYPICAL 75' TANGENT STR. ON NEW R.O.W.

CROSS SECTION VIEW #2



TYPICAL 75' TANGENT STR. ON NEW R.O.W.
ADJACENT TO EXISTING R.O.W. BY OTHERS

THIS DRAWING SHALL BE REVISED ON THE CADD SYSTEM ONLY

SCALE: NTS

NO.	REV.	DATE	BY
A	--------	--/--/--	---

CLIENT APPROVAL
APPROVED BY
COMPANY
DATE --/--/--

FIGURE 7-1A
KIBBY WIND POWER PROJECT
PROPOSED R.O.W.
CROSS SECTIONS

DESIGNED --- DRAWN RDW	CHCK. --- APPR. ---	DATE --/--/-- REVIEWED

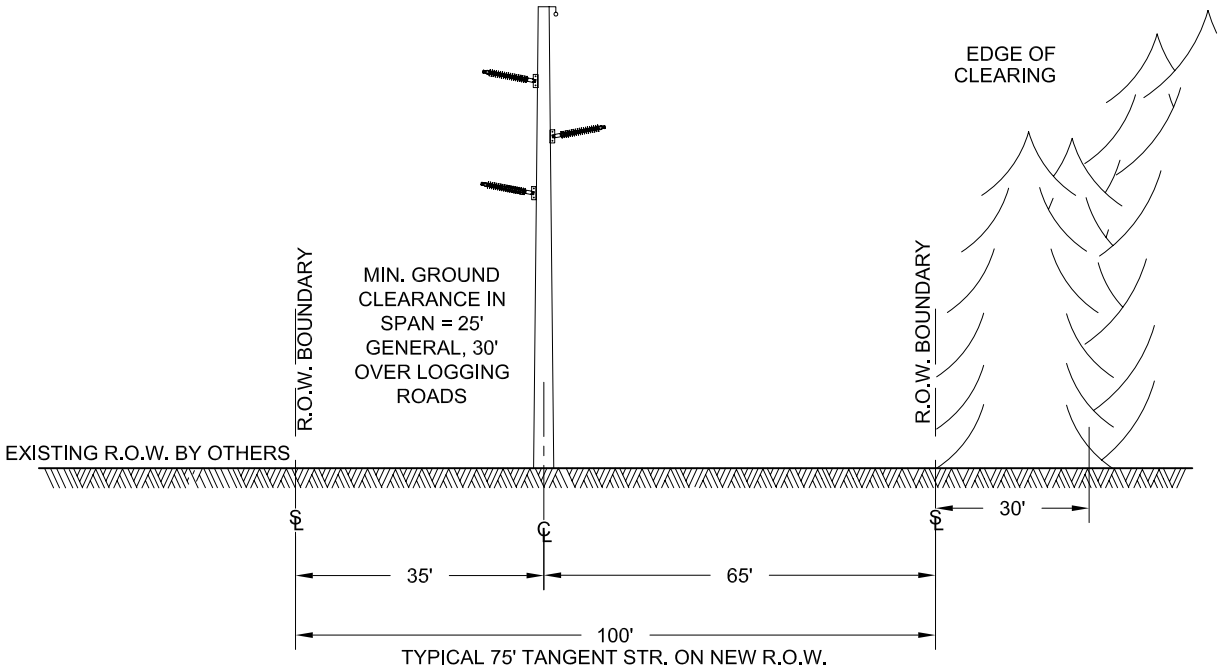
TRC
249 Western Avenue
Augusta, Maine 04330

13340-T0001-SH1

CONTRACT DWG NO.	PROJECT NO.
13340-T0001-SH1	13340

PROPOSED R.O.W.

CROSS SECTION VIEW
SINGLE POLE TANGENT



TYPICAL 75' TANGENT STR. ON NEW R.O.W.
ADJACENT TO EXISTING R.O.W. BY OTHERS

THIS DRAWING SHALL BE REVISED ON THE CADD SYSTEM ONLY

SCALE: NTS

NO.	REV.	DATE	BY
A	--------	–/–/–	---

CLIENT APPROVAL
APPROVED BY
COMPANY
DATE –/–/–

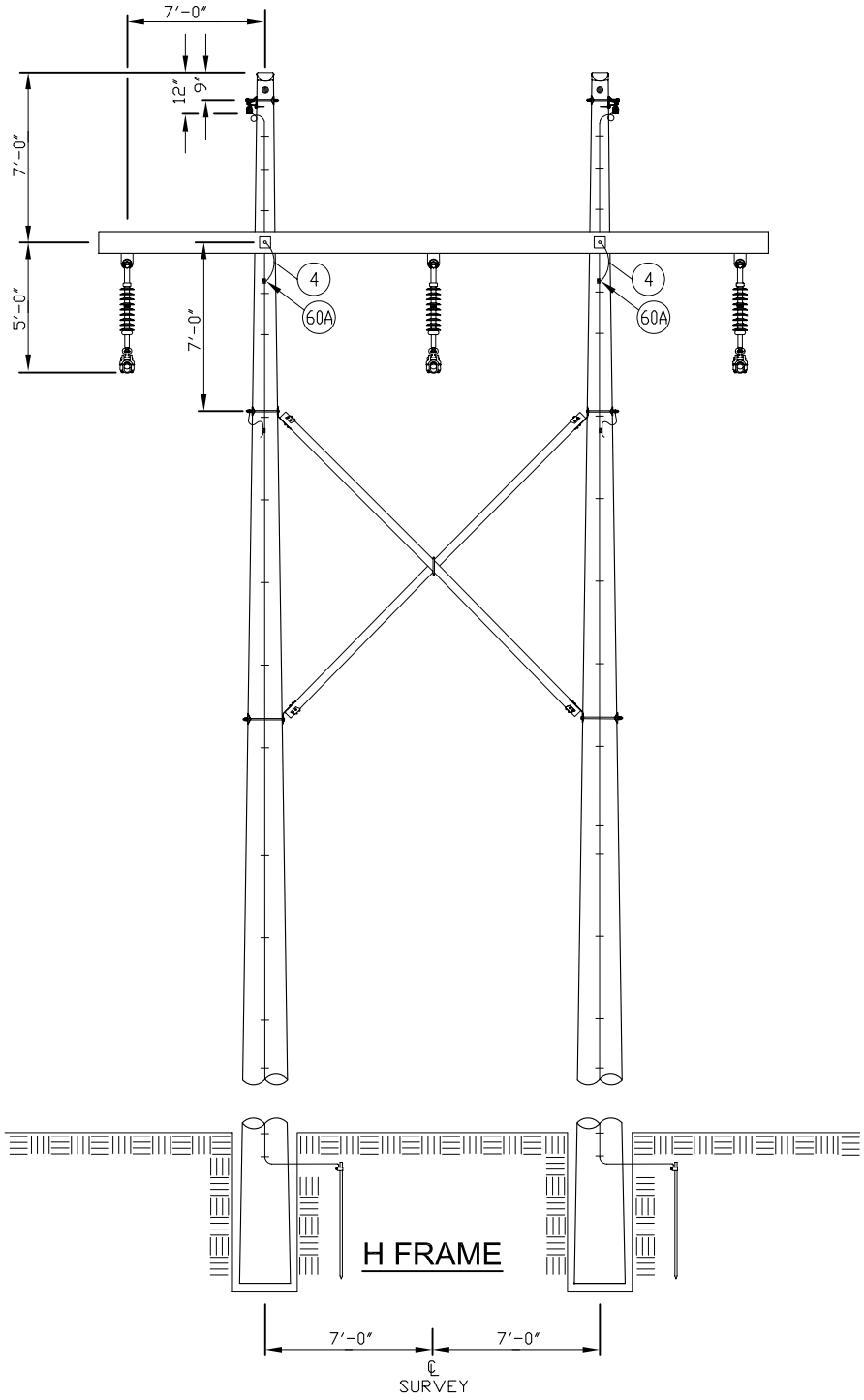
FIGURE 7-1B
KIBBY WIND POWER PROJECT
PROPOSED R.O.W.
CROSS SECTIONS

DESIGNED --- DRAWN RDW	CHCK. --- APPR. ---	DATE –/–/– REVIEWED

TRC
249 Western Avenue
Augusta, Maine 04330

13340-T0001-SH2

CONTRACT DWG NO.	PROJECT NO.
13340-T0001-SH2	13340



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NO.	REV.	DATE	BY
A	--------	–/–/–	---

CLIENT APPROVAL
APPROVED BY
COMPANY
DATE --/--/--

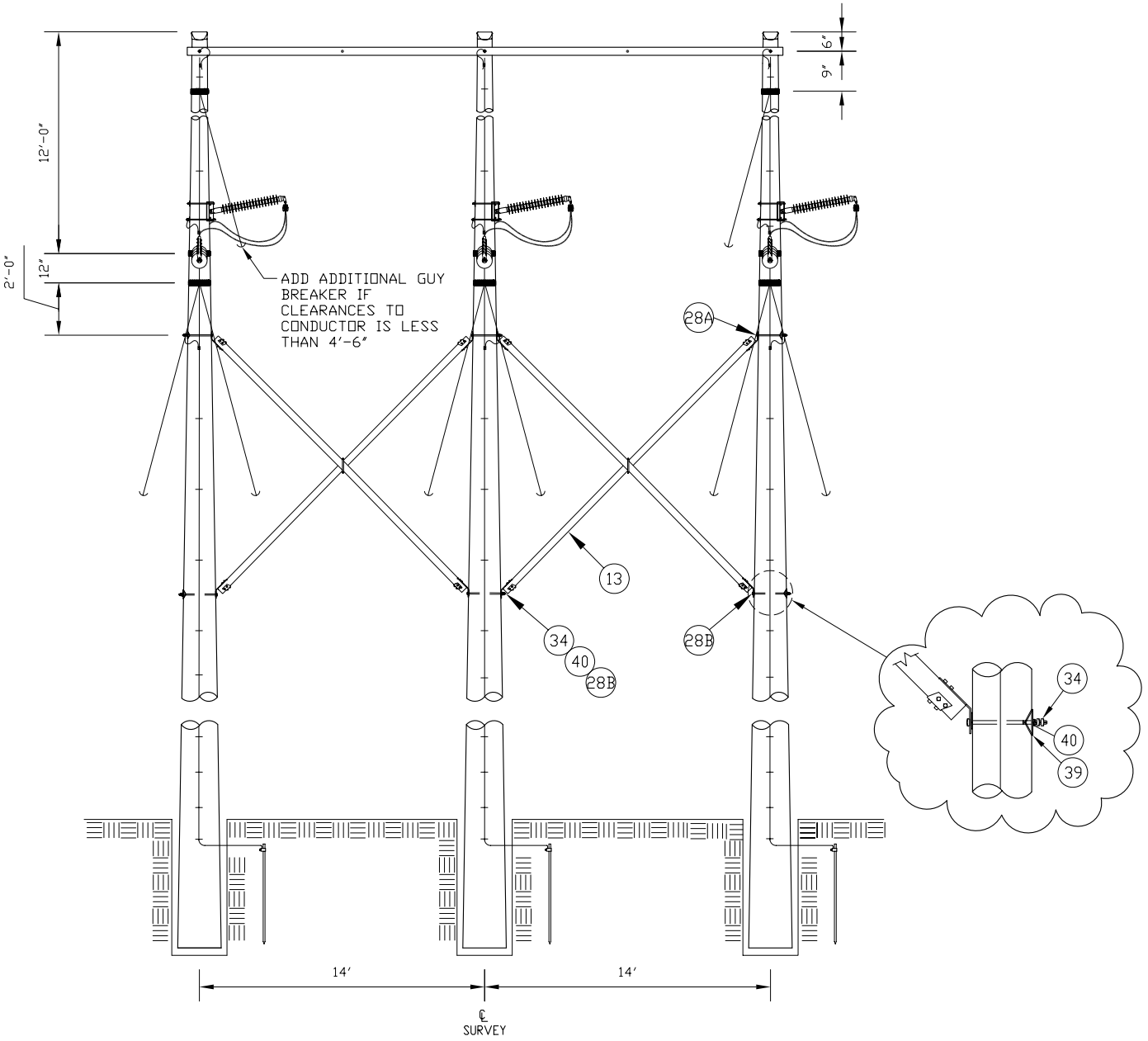
FIGURE 7-2
KIBBY WIND POWER PROJECT
STRUCTURE DETAILS
TYPICAL H-FRAME STRUCTURE

DESIGNED ---	CHCK. ---	DATE –/–/–
DRAWN RDW	APPR. —	REVIEWED

TRC
249 Western Avenue
Augusta, Maine 04330

13340-T0003-SH2

CONTRACT DWG NO.	PROJECT NO.
13340-T0003-SH2.DWG	13340



INLINE DEAD END

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NO.	REV.	DATE	BY
A	--------	--/--/--	---

CLIENT APPROVAL
APPROVED BY
COMPANY
DATE --/--/--

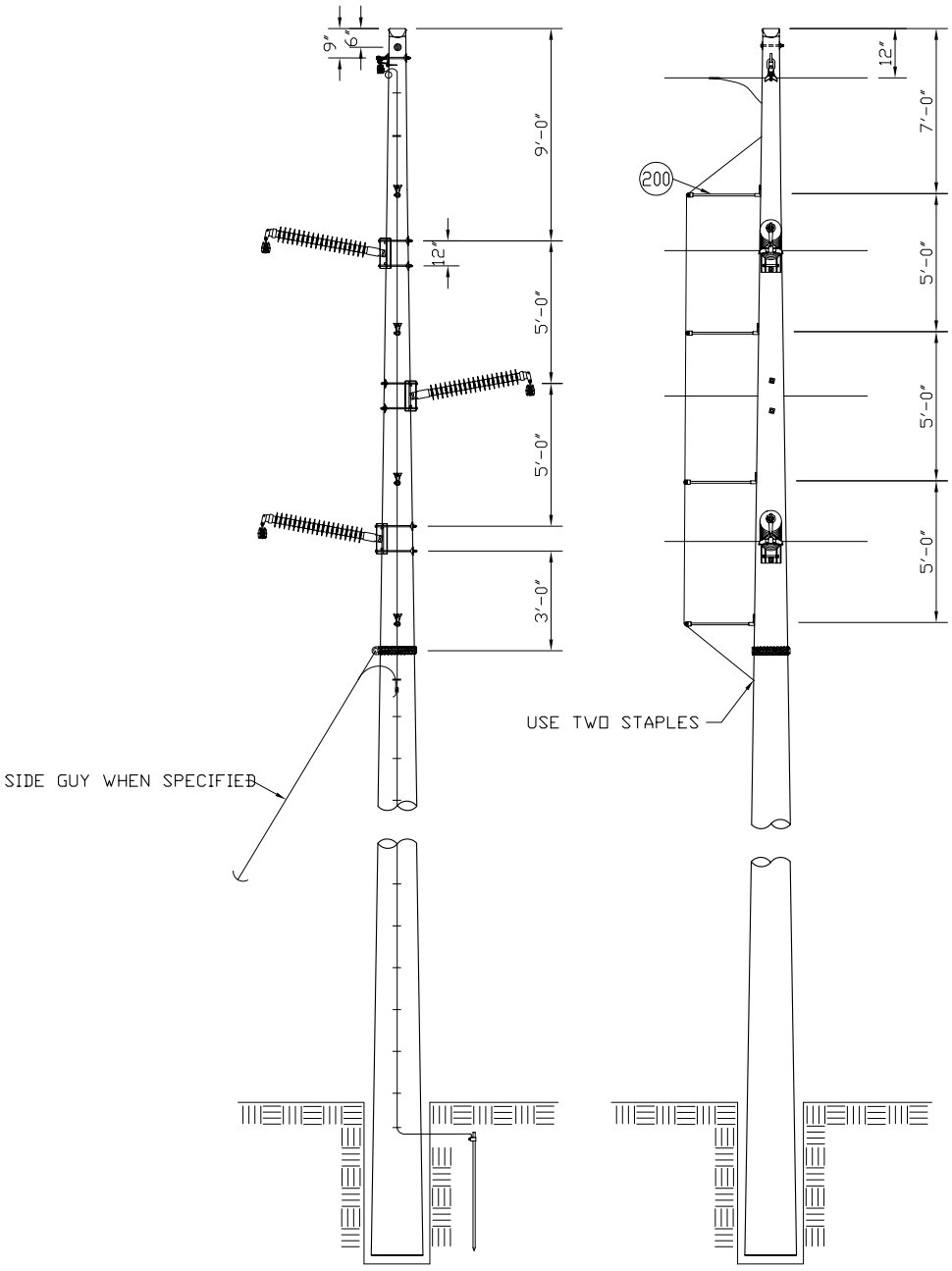
FIGURE 7-3
KIBBY WIND POWER PROJECT
STRUCTURE DETAILS
TYPICAL DEAD END STRUCTURE

DESIGNED ---	CHCK. ---	DATE --/--/--
DRAWN RDW	APPR. ---	REVIEWED

TRC
249 Western Avenue
Augusta, Maine 04330

13340-T0003-SH3

CONTRACT DWG NO.	PROJECT NO.
13340-T0003-SH3.DWG	13340



SINGLE POLE TANGENT

THIS DRAWING SHALL BE REVISED ON THE CADD SYSTEM ONLY

NO.	REV.	DATE	BY
A	--------	-/-/-	---

FIGURE 7-4
KIBBY WIND POWER PROJECT
STRUCTURE DETAILS
TYPICAL SINGLE POLE STRUCTURE

DESIGNED ---	CHCK. ---	DATE --/--/--
DRAWN RDW	APPR. ---	REVIEWED

CLIENT APPROVAL
APPROVED BY
COMPANY
DATE --/--/--

TRC
249 Western Avenue
Augusta, Maine 04330

13340-T0003-SH4

CONTRACT DWG NO.	PROJECT NO.
13340-T0003-SH4.DWG	13340

8.0 TEMPORARY WORK AREAS

Several temporary work areas are included in the design for Project construction (see Figure 3-1). These include:

- The construction control center (which will be converted to the O&M Building at the end of the construction period);
- A potential concrete batch plant (located proximate to the construction control center);
- Rock crushing plants;
- Material handling and storage areas; and
- Worker parking areas (located at the construction control center).

Each work area is located outside of wetland areas and include appropriate setbacks from other natural features. In the event any adjustment of location is required, these key siting parameters will be maintained. Work areas are further discussed below.

8.1 Construction Control Center

A temporary construction control center will be established at the intersection of Route 27 and Gold Brook Road to provide a location from which construction management logistics can be controlled. Construction trailers will be used. Potable water wells will be developed at the site (see Appendix O) for supplying water during construction; these will continue to be used as a potable supply for the O&M Building following completion of construction. Sanitary waste will be managed through the use of portable storage tanks. A communications system will be required at the facility, and approximately 150 parking spaces for construction workers will be included at this location.

The main Project staging area will be co-located with the construction control center. A variety of equipment and supplies can be temporarily stored at this site until they are needed for construction.

Erosion control measures are planned for the staging area, consisting of silt fence along the downslope boundary of the area where gradients are sufficient to result in soil transport (>5 percent). The construction specifications will include procedures intended to prevent spills and minimize any damage that may occur (see Section 9.1). Fuel storage areas within the staging area boundaries will be provided with containment facilities and spill prevention plans.

After construction is complete, debris and unused material will be removed, and the staging area returned to essentially the same conditions as existing prior to construction.

8.2 Concrete Batch Plant

A concrete batch plant may be required for use during foundation installation activities. It is proposed to locate this facility at the intersection of Route 27 and Gold Brook Road, in the vicinity of the proposed construction control center. This location has been recently used as a laydown area by the MDOT during its Route 27 widening project, and is relatively flat. The batch plant will require approximately 1.5 acres and additional area may be utilized for materials storage. Since the batch plant will require a water source, a potable groundwater well will be established during the construction phase. It is anticipated that approximately 28,000 gallons of water will be required during an 8-hour day. A water storage tank is anticipated to regulate peak demand during active construction periods. Following construction, this area will be restored to essentially its original condition.

8.3 Rock Crushing Plants and Temporary Material Storage Areas

The rock crushing plants, used to process excavated material into appropriately sized gravel for on-site construction purposes, will be co-located with the material handling and storage areas. Three locations have been located throughout the site for ease of logistics. Approximately 3 acres is required for each rock crushing operation. These areas accommodate a total of 20 additional acres of storage. This may be used for additional construction worker parking, temporary equipment storage, or stockpiling of gravel or other non-hazardous materials. Following construction, TransCanada will coordinate with Plum Creek to determine appropriate steps for removing stored materials and restoring the temporary work areas.

As an alternative or in addition to the larger rock crushing stations, TransCanada may utilize smaller, mobile rock crusher units. If used, mobile units would be located within a turbine pad and would not require additional clearing or alteration. Use of the mobile rock crushers would benefit construction logistics by minimizing the need for materials handling.

9.0 PLAN DEVELOPMENT AND IMPLEMENTATION

Throughout construction and operation of the Project, TransCanada will follow applicable standards and guidelines to ensure the safety of workers, the environment and the public. TransCanada will require contractors utilized in this effort to conform to TransCanada's standard safety and environmental requirements, as well as developing and following their own internal procedures for ensuring and documenting appropriate actions. The following section outlines several Project plans that have been developed for use in Project construction and operation.

9.1 Spill Prevention, Control and Countermeasure Plan

Appendix Q provides a Spill Prevention, Control, and Countermeasure (SPCC) Plan describing actions to be taken to prevent and control spills that may occur in association with construction of the Project. An SPCC Plan associated with operation of the wind turbines, the Kibby Substation and the O&M Building will be completed in accordance with 40 Code of Federal Regulations (CFR) 112 and submitted to LURC upon completion.

9.2 Stormwater Management Plan

Appendix R provides a Stormwater Management Plan that addresses measures to accommodate the increase in stormwater runoff associated with the construction of new access roads, turbines and ancillary structures at the Project site. Stormwater management is not a concern along the proposed transmission line corridors, as no significant new impervious area or changes to land cover are included that would alter drainage patterns and runoff volumes and flow rates. A copy of the *Notice of Intent to Comply With Maine General Construction Permit* required by the Maine Pollution Discharge Elimination System is also included in Appendix S.

In addition to other stormwater compliance issues, calculations have been conducted to determine the net increase in phosphorus export resulting from the project. The analysis was done only for a portion of the B Series ridgelines which are within the watersheds of two lake watersheds as defined by DEP: Jim Pond and Flagstaff Lake. The total Project construction area within the Jim Pond Watershed watershed (excluding the 115 kV transmission line) represents approximately 0.84 percent of the watershed area. The Project construction area within the Flagstaff Lake Watershed is approximately 0.04 percent of the total watershed area.

Although the Project will not contribute significantly to flows within these watersheds, the Project has been designed with phosphorus control in mind by passing on-site runoff through vegetated buffers via overland flow. Vegetated buffers are effective for phosphorus removal when designed in accordance with the DEP BMP manual (2006). For the Project, three types of vegetated buffers will be employed as part of the stormwater management plan, depending upon the specific location and use: a buffer with a stone-berm level lip spreader; a buffer adjacent to the downhill side of a roadway; and a ditch turn-out buffer.

The effectiveness of these buffers depends on the buffer flow path length (or width), buffer slope, hydrologic soils class, size of drainage area, and density of vegetation (woods or meadow). Above all, the vegetated buffer dimensions must be protected and maintained. In order to successfully maintain these project buffers, adequate land must be available within the project property boundaries to provide buffer flow path length meeting the BMP Manual Design Standards. Any buffers that extend beyond the Project property boundaries are at risk of being encroached by logging or development activities. TransCanada will work with Plum Creek to ensure that vegetative buffer areas established to ensure appropriate phosphorus reduction are maintained.

Calculations were conducted to determine the quantity of phosphorus (in pounds) available for algae growth in the Jim Pond and Flagstaff watersheds exported from the project. According to DEP, approximately 50 percent of the net (incorporating reductions from vegetative buffers) phosphorus export will be available for algae growth in lakes. This is the value used to compare against the allowable export allocation provided by DEP. The gross phosphorus export from the Project was calculated using standard export rates for grass and gravel roadway cover provided by DEP.

A calculation was then performed to determine the weighted treatment factor for the vegetative buffers, a value from 0 to 1, located just downslope of fill areas and level spreaders. The buffer treatment factor is a function of slope, soil type, and width. DEP provides standard treatment factors for slopes ranging from 0 – 3 percent, 3 – 8 percent, 8 – 15 percent, and 15 – 30 percent, depending on the hydrologic soil group and buffer width. Slopes over 30 percent do not provide a significant treatment of phosphorus. A slope analysis was conducted for a 250-foot wide area adjacent to the Project. Areas were computed for each of the above slope categories to determine an overall weighted treatment factor for Jim Pond and Flagstaff watersheds.

The computed export rates, accounting for the buffer treatment factors and the 50 percent algae growth reduction factor, for Jim Pond and Flagstaff, are 21.8 and 13.4 pounds, respectively. The corresponding allowable export rates provided by DEP are 30.1 and 26.4 pounds, respectively. Therefore, according to the calculations, the Project is not exporting more phosphorus than is permitted.

9.3 Erosion and Sedimentation Control Plan

Appendix E provides the Erosion and Sedimentation Control Plan that has been developed for the Project. The Erosion and Sedimentation Control Plan outlines initial construction activities for construction preparation; construction sequencing information; BMPs to be utilized during construction for a range of conditions; considerations for winter construction (particularly relevant for construction along the 115 kV transmission line corridor); site restoration standards; supervision and inspection plans; and environmental training procedures. The Erosion and Sedimentation Control Plan consists of a narrative, sequence of construction, site plan drawings showing temporary Erosion and Sedimentation Control measures, and construction details. The

general approach to control sediment and erosion during construction is to maintain separation of off-site (clean) runoff and on-site (sediment laden) runoff through the use of diversion channels, cross-culverts, and level spreaders. Ordinarily, these diversions are constructed in advance of the major earth moving activities. On-site (sediment laden) runoff is treated through the use of mulch filter berms (where overland flow is maintained) and sediment traps (where concentrated flow exists). Disturbed areas will be stabilized as soon as possible after reaching final grade to minimize the area disturbed at any given time. Stabilization methods are described in detail as part of the Erosion and Sedimentation Control Plan and include seed/mulch, reinforcement matting, rock, and erosion control mix.

9.4 Vegetation Management Plan

Appendix J provides the Vegetation Management Plan developed for the Project. In addition to identifying specific construction and maintenance issues associated with Project transmission line rights-of-way, it identifies measures to be implemented in various restricted areas (e.g., natural resource setback areas, rare plant areas). Training of maintenance personnel to ensure that vegetation issues are appropriately managed is also addressed in this plan.

10.0 SOILS RESOURCES

The Kibby Wind Power Project team has consulted throughout the Project with David Rocque, State Soil Scientist from the Maine Department of Agriculture on issues relating to the intensity and scope of the soil survey for the Project, Project hydrology and protection of the natural resources of the Project area. Through this consultation, most recently during a meeting at LURC's offices on March 4, 2008, Mr. Rocque confirmed that the soils information prepared for the Preliminary Development Plan (presented in Appendix T for the turbine Project elements and Appendix U for the 115 kV transmission line) remain an appropriate level of detail for the Project, with some minor exceptions.

Mr. Rocque has requested that, as a condition of FDP approval, additional information be provided prior to construction in order to confirm that suitable locations have been selected for the various temporary construction areas described in Section 8. Information requested for such temporary work areas consists of hand auger soil investigations by a qualified soil scientist to assess distance to groundwater and determine that soil moisture content would not require relocation or the use of special design measures in order to minimize soil disruption. TransCanada has selected locations for temporary construction use that, based on preliminary site reconnaissance and mapping review, should be suitable in this regard. As a preliminary construction effort, TransCanada will review with selected contractors the specific temporary workspace requirements, further minimize workspace needs to the extent possible, and conduct additional field survey consistent with Mr. Rocque's recommendation to confirm that appropriate locations have been selected. The results of the soils review will be provided to LURC and Mr. Rocque, along with adjustments, if any, in temporary workspace requirements or locations.

Additional soils information was also requested for the Kibby Substation and O&M Building locations. Mr. Rocque recommended that a High Intensity Soil Survey be completed for the proposed location of each of these permanent features in order to confirm soil suitability and/or identify specific design measures that would be required to accommodate soil conditions. Soils suitability testing in the vicinity of the O&M Building has been completed by a Maine licensed site evaluator (Appendix N) in order to locate the proposed septic system on the site. Additional soils mapping will be completed by a qualified soil scientist as an early element of Project construction to further refine design details associated with the substation and O&M Building structures. The completed information will be provided to LURC and Mr. Rocque for approval prior to commencing construction of these two structures.

11.0 WETLAND AND STREAM RESOURCES

Detailed information was provided in the Preliminary Development Plan regarding alternatives analysis and existing resource characteristics of wetlands, vernal pools and streams in the vicinity of the Project. Since the filing of the Preliminary Development Plan, TransCanada has continued to work to reduce impacts. A total of approximately 1.5 acres of wetland fill was included in the Preliminary Development Plan layout. Table 11-1 summarizes wetland impacts associated with Project refinements incorporated into the FDP.

Table 11-1: Summary of Anticipated Wetland Fill

	Impact Area (acres)				
	P-WL1	**P-WL2**	**P-WL3**	**Streams**	**Total**
Turbine Access	0.12	0.09	0.11	0	0.32
Turbines	0	0	0	0	0.00
Collector Lines	0	0	0	0	0.00
115 kV Transmission Line	0	0.03	0	0	0.03
Total	**0.12**	**0.12**	**0.11**	**0**	**0.34**
	(5,114 ft^2)	(5,060 ft^2)	(4,829 ft^2)	(0 ft^2)	(15,003 ft^2)

TransCanada has thoroughly evaluated Project alternatives and refined the Project layout several times to avoid and minimize wetland and stream impacts wherever practicable. The Project includes a very small amount of unavoidable impact to wetland resources relative to the size of the Project. As a result of careful layout and design refinements, the Project as proposed will result in a total of about 0.4 acres of permanent wetland fill. Erosion control BMPs, as outlined in the Erosion and Sedimentation Control Plan provided in Appendix E, will be employed in order to minimize temporary impacts.

11.1 A-Series Impacts

Wetland impacts associated with the A Series (17 turbines) are shown in Table 11-2, and described in the following sections. The A Series impacts result from permanent fill associated with access roads. There are no temporary wetland impacts or stream crossings associated with the A Series.

11.1.1 A-Series Access Road Impacts

No wetland impacts are associated with the roadways that extend between turbine strings. A total of 0.060 acre (2,595 square feet) of impact is associated with the primary access to the A Series. In every instance of impact, detailed consideration has been given to whether wetland impact could be avoided, and to minimization of any necessary impact.

Table 11-2 Unavoidable Wetland Impacts Associated with the A Series

Wetland ID	Wetland Type	LURC Subdistrict	Total Impact		Explanation
			Square Feet	Acres	
C-148	PSS	P-WL1	758	0.017	Permanent wetland impact due to the widening of an existing unnamed access road off of Gold Brook Road. An existing culverted crossing will be enlarged. Use of an existing road minimizes overall impacts.
C-188	PFO	P-WL3	299	0.007	Wetlands have been avoided to the extent possible, but steep grades and road engineering/turning radius requirements make this limited wetland impact unavoidable. Potential impact to boreal bedstraw at this location will be minimized by BMPs including preconstruction survey, marking as "sensitive resource area," and review with Project engineers and construction managers prior to construction.
C-189	PFO	P-WL3	294	0.007	Same as C-188.
C-190	PFO	P-WL3	181	0.004	Same as C-188.
C-191	PFO	P-WL3	1,063	0.024	Same as C-188
Total			***2,595***	***0.060***	**P-WL1: 758 sf** **P-WL2: 0 sf** **P-WL3: 1,837 sf**

Wetland C-148. Access off of Gold Brook Road was selected in order to utilize an existing road corridor and thus minimize new impacts to the greatest extent possible. Other locations where roads could have been extended toward the Series A ridgeline have additional wetland constraints. Because the existing road is not sufficiently wide to accommodate the equipment needed for Project construction and operation, this existing road must be widened. Wetland C-148 is found on both sides of the existing road, and it drains under the road in an existing culvert. This is a palustrine scrub-shrub (PSS) wetland, LURC Subdistrict P-WL1, due to its association with a stream south of the road. This crossing impact could not be avoided through the use of roadway alignment shifts. The road has been designed to be as narrow as can support the Project needs. This will result in a permanent fill of 0.017 acre (758 square feet). Given the nature of the PSS and the small incremental change to this existing wetland crossing, no significant effect on functions and values is anticipated.

Wetlands C-188, C-189, C-190 and C-191. The wetland fill proposed is associated with the switchback curve required to access the ridgelines with appropriate grade and curve radius. Numerous small wetlands are located throughout the vicinity of this slope. These are all palustrine forested (PFO) wetlands, LURC Subdistrict P-WL3. Project engineers worked to minimize fill to the greatest extent possible given the character of the slopes. Only very small areas of Wetlands C-188 and C-189 are encroached upon with fill (0.007 of an acre each). Due to the relatively small total area of wetland that will be impacted, no significant net loss of functions and values is anticipated. Wetlands C-190 and C-191 extend across the proposed road location, and small portions of those wetlands will be filled (0.004 and 0.024 of an acre, respectively). Design measures have been incorporated into the roadway to ensure that hydrologic connections are maintained and the functions and values of the wetlands are substantially unaffected.

11.1.2 A-Series Turbine Impacts

No wetland impacts are associated with Series A turbines.

11.1.3 A-Series Stream Crossing Impacts

No stream crossing impacts are associated with Series A turbines.

11.2 B Series Impacts

Wetland impacts associated with the B Series (27 turbines) are shown in Table 11-3, and described in the following sections. As discussed, there are impacts associated with placement of culverts for stream crossings and permanent fill associated with access roads. There are no impacts associated with temporary fill for B-Series impacts.

11.2.1 B-Series Access Road Impacts

Wetland fill associated with proposed Series B roads occurs for two general types of activity:

- Access to the ridgeline (Wetland C-198); and
- Access between turbines (small areas of 5 additional wetlands).

A description of each of the individual wetland impacts is provided below.

Table 11-3 Unavoidable Wetland Impacts Associated with the B Series

Wetland ID	Wetland Type	LURC Subdistrict	Total Impact		Explanation
			Sq. Feet	Acres	
A-180	PSS	P-WL1: 2,588 sf P-WL2: 3,252 sf	5,840	0.134	Impact is necessary for the access road between turbine pads. The wetland impact is unavoidable due to nearby steep slopes and bedrock outcrops.
A-183	PSS	P-WL2	67	0.002	This impact is necessary for the access road alignment adjacent to a turbine pad flanked by steep slopes on either side. The use of ledge for the road alignment minimizes additional cut or fill that would be necessary if the road were shifted to either side.
A-184	PFO	P-WL3	2,992	0.069	This impact is necessary for the access road alignment adjacent to a turbine pad location that has a steep rocky slope above it and a steep slope below it. Use of ledge for cut or fill in this area minimizes wetland impact.
A-197	PEM	P-WL2	642	0.015	This impact is necessary because the wetland is a narrow sloping seep that is flowing perpendicular to the road alignment. The road crossing has been aligned to cross the narrowest section of the wetland, minimizing impacts.
C-163	PEM	P-WL2	199	0.005	The impact is necessary for access roads between turbine pads. The location is optimal due to moderate grades and needs to be aligned with other portions of the road to meet engineering constraints such as radius and slope.
C-198	PSS	P-WL2	1,528	0.035	Impact is due to necessary widening of existing road; use of existing road and the proposed alignment minimizes wetland impacts.
Total			***11,268***	***0.259***	**P-WL1: 2,588 sf** **P-WL2: 5,688 sf** **P-WL3: 2,992sf**

Wetland C-198. Access to the ridgeline has been selected in a location that minimizes potential wetland impacts. In numerous other locations examined for potential access, larger wetland areas would need to be crossed, and would have resulted in a significantly greater level of impact. The selected access utilizes as its starting point an existing unnamed road off of Gold Brook Road at about Mile 3.5. The existing road is utilized primarily for forest management access.

Wetland C-198, a PSS wetland, LURC Subdistrict P-WL2, is located immediately past the end of the existing road and is in a sloping depression in a recent clear cut. Wetland C-198 could

not be avoided because it drains to the west, perpendicular to the proposed access road. Avoiding the wetland would require creating a significant length of new road. The crossing is at a narrow point of the wetland, which minimizes the impact necessary. As proposed, the selected access to the ridgeline results in impact of 0.035 acre (1,528 square feet) to Wetland C-198. This represents a small encroachment into this PSS wetland. Given the nature of the PSS and the small incremental change, no significant effect on functions and values is anticipated.

Wetlands A-180, A-183, and A-184. Turbine locations and the location of roads extending between turbines focused on selecting relatively flat grades where the need for cut and fill could be minimized. Given the terrain of Kibby Range (which has undulating contours) this has not been possible in all locations. The need to grade for safe travel corridors results in several areas where the required extent of cut and/or fill necessitates five areas of limited wetland fill.

Wetland A-183, a PSS (P-WL2), is a very small wetland (67 square feet, or 0.002 acres) that will be completely filled by road construction on the slope. A large part of Wetland A-180, a PSS (P-WL1 and P-WL2), will also be filled. A portion of Wetland A-184 (a PFO, P-WL3) will be filled. The terrain in this location is relatively steep and involves wider grading areas. Numerous small wetland areas similar in character are located throughout this portion of the ridgeline. Wetland A-180 includes an intermittent stream channel (as discussed in Section 11.2.3) for which design measures will be incorporated to ensure that water flow can continue through this area. Although approximately 0.2 acre (8,899 square feet) of wetland will be lost in this area, the wetlands are spread over approximately 1,600 feet. The primary function of these wetlands is to provide for groundwater discharge and it is not anticipated that a significant impact to functions and values will result.

Wetland A-197. Wetland A-197 is a relatively expansive palustrine emergent (PEM) wetland, LURC Subdistrict P-WL2, located in an area of the ridgeline with many such pockets of wetland area. In this location, a road was eliminated from an earlier layout and design adjusted in order to avoid a wetland system and sub-watershed located to the east of this area which contains suitable habitat for the northern bog lemming. If the roadway were to be located further east, this habitat area would be affected; if further west, the steeper slopes would require significantly greater fill slopes, and greater wetland impacts. The grades in this area allow for a relatively narrow roadway cross-section. Where the road will cross Wetland A-197 a culvert will be installed, as well as other appropriate measures to ensure that subsurface drainage continues. The road placement has been positioned in the narrowest portion of the wetland, resulting in a total of 0.015 acre (642 square feet) of wetland impact. It is not anticipated that the road, as designed, will have a significant impact on the functions and values currently provided by this wetland since this is a small percentage of the total wetland area.

Wetland C-163. Wetland C-163 is a small PEM wetland (LURC Subdistrict P-WL2) located in the southeasterly portion of Kibby Range at the toe of a very steep slope in an area with many similar small wetland areas. In this location, the road layout is placed between two higher elevation areas, requiring substantial cut and fill on either side. As a result, a small portion of

Wetland C-163 will be filled. Moving the road further west would have the potential to impact a greater amount of wetland; moving the road further east would increase cut requirements and the potential for other impacts including increasing erosion potential from significantly larger areas of cut and fill. A total of 0.005 acre (199 square feet) will be impacted, which is not anticipated to significantly affect wetland functions and values in the area.

11.2.2 B-Series Turbine Impacts

No wetland impacts are associated with Series B turbines.

11.2.3 B-Series Stream Crossing Impacts

The streams traversed by proposed roads are outlined in Table 11-4.

The proposed access road crosses Stream C-193 (LURC Subdistrict P-SL2) near the intersection of the new road with the existing access off of Wahl Road. Because the stream flow is toward the south, parallel to the closest Project ridge, it is necessary to cross the stream in order to provide access to the Project. Due to the grades along this portion of Kibby Range, an area of fill is needed over the stream channel, necessitating the placement of a culvert that would enclose approximately 75 feet of existing stream. Headwalls and wingwalls will be used at each end of the culvert, along with steeper reinforced fill slopes, to limit the length of impact to this stream. The culvert and associated outlet protection measures will be designed to safely pass the design storm event.

As noted above, impacts are necessary to intermittent stream A-180 (LURC Subdistrict P-SL2), which forms two distinct channel areas within an area where significant fill is required. The two channels carrying intermittent flow (at lengths of 43 and 73 feet) converge to form one channel. Each of these channels is formed by groundwater discharge seeping out of the toe of a steep slope. Rock drainage blankets will be installed to maintain the intermittent flow conveyance under the fill slope and maintain slope stability. Off-site surface runoff from the Turbine B-3 area, collected at a point just east of Turbine B-3, will be conveyed through this fill area with a culvert that will be approximately 225 feet long placed adjacent to Wetland A-180.

Both C-166 and G-1 are intermittent stream channels (LURC Subdistrict P-SL2) that flow perpendicular to the proposed access. Adjustment of roadway location would not, therefore, avoid the need to cross these channels. Culverts were designed to ensure that flow continues unimpeded.

Stream C-202-1 is a perennial stream that functions as the outlet of PEM wetland C-181, and is 3 feet wide, and has a gravel/cobble substrate. This stream flows toward the west away from turbine B-7. Placement of the access road to the west of turbines B-7 and B-8 allows the road to avoid wetland C-181 and other nearby wetlands, and minimize cut and fill on the steep slope east of these turbines. The stream will be appropriately culverted over a length of approximately 50 feet.

Table 11-4 Stream Crossings Associated with the B Series

Stream ID	Intermittent or Perennial	LURC Subdistrict	Width (feet)	Need for Unavoidable Impact/Special Considerations
C-193	Perennial	P-SL2	4	A small population of lesser wintergreen (*Pyrola minor*), a state-listed S2 plant, was found along stream channel C-193. The road alignment has been modified to avoid impacts to this population. A preconstruction survey, marking the area as a "sensitive resource area," and reviewing the proposed crossing location with the Project engineers and construction managers will avoid impacts to this plant at this site.
A-180	Intermittent Segment 1 (A-180-1)	P-SL2	3	The stream flow is perpendicular to the road alignment, necessitating a crossing. An appropriately sized culvert will be installed to maintain flow.
	Intermittent Segment 2 (A-180-2)	P-SL2	2	The same justification as A-180-1. The stream flow is perpendicular to the road alignment, necessitating a crossing. An appropriately sized culvert will be installed to maintain flow.
C-166	Intermittent	P-SL2	3	The impact is for the access road. The stream flow is perpendicular to the road alignment, necessitating a crossing. An appropriately sized culvert will be installed to maintain flow.
G-1	Intermittent	P-SL2	1	The impact is for the main access road to B Series. The stream flow is perpendicular to the road alignment, necessitating a crossing. An appropriately sized culvert will be installed to maintain flow.
C-202-1	Perennial	P-SL2	3	Impact to this stream is necessary for the access road to turbine B-7. A culvert crossing of this stream permits the road to avoid impacting a large PEM wetland and other nearby wetlands.

11.3 Collector Line Impacts

No permanent wetland fill is associated with the collector line extending from either the A Series or the B Series to the proposed Kibby Substation. The 60-foot wide collector line corridor will traverse wetland and stream areas, but will not directly impact them. The B Series collector line does not traverse wetlands or streams until it is co-located with the 115 kV transmission line; potential impacts associated with that segment are addressed in Section 11.4. Although the A Series collector line will extend above three wetland areas (as outlined in Table 11-5), no permanent impact is anticipated to occur, and no clearing will occur within these wetlands as they are scrub-shrub in character.

Table 11-5 Wetlands Traversed by 34.5-kV Collector Lines

Wetland ID	Wetland Type	LURC Subdistrict	Total Area		Comments
			Square Feet	Acres	
D-51	PSS	P-WL2	410	0.009	No clearing required; conversion will not result. Fill impacts not required.
D-54	PSS	P-WL2	10,967	0.252	No clearing required; conversion will not result. Permanent fill impacts not required. Temporary fill impacts from clearing and construction access.
D-55	PSS	P-WL1: 1,306 sf P-WL2: 3,919	5,225	0.120	No clearing required; conversion will not result. Permanent fill impacts not required. Temporary fill impacts from clearing and construction access.
Total			***16,602***	***0.381***	

Because each of the three wetlands traversed are currently PSS, no wetland clearing will be required for the collector line corridor. The existing character and function of the wetlands will remain with the collector line in place. Therefore, no permanent wetland impact will be associated with this element of Project work. There will be temporary impacts, however, from equipment mat crossings associated with clearing and construction. Mats will temporarily occupy 0.09 acre of wetland D-54, and 0.05 acre of wetland D-55. Wetland D-51 will be avoided.

The Series A collector line will also traverse four streams, as outlined in Table 11-6.

Table 11-6 Collector Line Unavoidable Stream Crossings

Stream ID	Intermittent or Perennial	LURC Subdistrict	Width (feet)	Need for Unavoidable Impact/Special Considerations
D-52	Intermittent	P-SL2	2	Spanning with electric conductors only. No permanent fill. Temporary impacts from equipment mats spanning channel for clearing and construction access.
D-55	Intermittent	P-SL2	3	Spanning with electric conductors only. No permanent fill. Temporary impacts from equipment mats spanning channel for clearing and construction access.
D-56 (Kibby Stream)	Perennial	P-SL2	30 – 50	Spanning with electric conductors only. No fill.
D-57	Intermittent	P-SL2	3	Spanning with electric conductors only. No fill.

Kibby Stream, and all of the streams within this watershed, are classified as Class A by DEP. Consultation with USFWS and MDIFW has determined that no rare, threatened or endangered aquatic species utilize these channels as habitat. Because these streams are located in a headwater area, water quality is high and they all support coldwater fisheries. Potential impacts from construction will be temporary, and include spanning two of the streams with equipment mats during construction. Kibby Stream will not be crossed by construction equipment, and will be approached from either side of the stream. At the other stream crossings, when equipment mats are required, they will be removed and any restoration needed will be performed as described in the Erosion and Sedimentation Control Plan (Appendix E). Pursuant to discussions with MDIFW, 100-foot buffers will be maintained on all perennial streams (see Appendix J), which will provide shade for the streams and help to maintain cool water temperatures. The use of herbicides is also prohibited in these buffers. Since the electrical conductor right-of-way will be maintained in a manner that promotes the growth of shrub species up to 8 feet tall, intermittent streams will also be only temporarily impacted during construction, and will be adequately shaded by typical right-of-way vegetation.

11.4 Transmission Line Impacts

A total of 155 wetlands occur within the proposed 27.6-mile transmission line corridor. Only three wetlands will be impacted by permanent fill from the placement of structures and guy anchors. A total of 37.02 acres of PFO wetland will be converted to PSS or PEM to accommodate the overhead spanning by conductor lines, and up to 7.54 acres of wetlands may be temporarily impacted during construction by equipment mats used for construction access (if construction is not able to be performed in winter months).

11.4.1 Wetland Fill Impacts

Impacts from structures have been avoided and minimized as much as possible during design of the transmission line. Total permanent fill impacts to wetlands from installation of the transmission line is approximately 1,140 square feet, or 0.026 acre of wetland (Table 11-7).

Table 11-7 Unavoidable Permanent Impacts to Wetlands from Structures and Anchors on Transmission Line ROW

Location	Type of Impact	Wetland ID	Wetland Type	LURC Subdistrict	Impact Area
Structure 31	Structure placement in wetland	B-151	PSS	P-WL2	160 ft^2
Structure 32	Structure placement in wetland	B-151	PSS	P-WL2	160 ft^2
Structure 169	Structure placement in wetland	A-134	PFO	P-WL2	160 ft^2
Subtotal Structure Impact				***480* ft²**	
Structure 33	Anchors (4)	B-151	PSS	P-WL2	240 ft^2
Structure 210	Anchors (7)	A-117	PSS	P-WL2	420 ft^2
Subtotal Anchor Impact				***660*** ft^2	
Total Fill Impacts 1,140 square feet (0.026 acre)					

Each fill impact is discussed further below.

Pole Structures 31 and 32 and Anchors for Structure 33, Wetland B-151. Although avoidance of wetland fill has been a priority for the design and layout of the 115 kV transmission line, the expansive nature of Wetland B-151 (7.65 acres of that wetland are located within the right-of-way, spanning approximately 1,600 feet along the proposed transmission center line) made it impossible to provide for pole placement with appropriate spans without impact. A span length greater than 1,600 would be required to avoid wetland impact. A span length of this magnitude is not practical because of site characteristics and engineering constraints. In relatively flat topography, as exists in this area, span lengths longer than approximately 700 to 800 feet would require taller structures to maintain electric conductor height that meets electrical safety code standards. H-frame construction, similar to that proposed, of sufficient height to maintain safe conductor height in this relatively flat terrain, would likely not support the stress from the longer span. The larger structures required to support such a long span would need to be metal frame structures with concrete foundations, which would lead to significantly greater construction impacts from equipment access, materials delivery and installation, and would have a significantly higher cost.

The impact to wetland B-151 is located at approximately Milepost 4 on the 115 kV transmission line right-of-way. Wetland B-151 is a large seepage PSS wetland, LURC Subdistrict P-WL2, which is adjacent to a gravel logging road as well as to two intermittent streams. The wetland shows signs of disturbance associated with skidder trails. Adjusting the right-of-way corridor would not have reduced potential for impact, since the wetland extends further to the east and west, as well as along the right-of-way itself. Structure 30 was positioned in upland, relatively close to the wetland edge in order to minimize the number of wetland intrusions necessary. Angle Structure 33 was positioned as far as possible from the wetland, given span length requirements. However, because it is in a location requiring a deadend structure, guying support is required (the more typical H-frame structures utilized for the majority of the right-of-way do not require guys and anchoring). Four of the anchor supports for Structure 33 are required to extend into the edge of this wetland area. Structures 31 and 32 are required to be placed within the wetland.

Pole Structure 169, Wetland A-134. At mile 21 just prior to the Route 16 crossing, the 115 kV transmission line right-of-way turns southeast to avoid a large wetland and stream complex, and then turns east again to cross Route 16. The right-of-way must traverse an existing CMP 34.5 kV transmission line and then turn to join the existing Boralex transmission line right-of-way. In this transitional area, where the proposed right-of-way adjusts direction, numerous wetland systems intersect with the right-of-way and occur within the general surroundings. Due to span and height requirements to avoid interference with the existing 34.5 kV transmission line and in order to avoid unpredictable stresses on the structures, the placement of Structure 169 necessarily was within the wetland area. Wetland A-134 is a PFO (LURC Subdistrict P-WL2) that is currently impacted by Route 16, as well as the existing CMP right-of-way, which extends through this wetland to the south of the proposed pole location.

Anchors for Structure 210, Wetland A-117. East of Milepost 26, Structure 210 is placed adjacent to an angle in the existing Boralex right-of-way. Because the proposed 115 kV transmission line is co-located with and paralleling the right-of-way, an angle is required in the proposed right-of-way as well. Wetland A-117 is a small PSS located in the existing Boralex 115 kV right-of-way, adjacent to an existing three-pole angle structure. The proposed structure 210 is located outside of Wetland A-117. However, a steep topographic depression just west of the pole location requires more extensive anchoring for the angle structure than is required in other locations. Seven of those anchors must be placed within the wetland area in order to provide sufficient support for the structure.

11.4.2 Potential Stream Impacts

A total of 76 streams occur within the 115 kV transmission line right-of-way. Details of the location and characteristics of each are provided in Table 11-8. Each stream will be spanned by the proposed transmission line conductor and there will be no permanent impacts. Some indirect impacts may occur as a result of clearing adjacent forested wetlands and/or uplands. However, stream buffers will be established where vegetation removal will be minimal and future maintenance limited. The buffers restrict clearing and help maintain habitat and water quality values. Canopy trees within forested buffers will be cleared, but saplings and shrubs below minimal safety thresholds will remain. All poles will be located outside of the streams and buffer areas and, as such, there will be no fill impacts. A 100-foot buffer that includes restrictions on clearing and use of herbicides will be maintained on either side of all perennial streams. Additional detail with regard to buffers is provided in the Vegetation Management Plan (Appendix J).

Small streams may be crossed using equipment mats creating minor temporary impacts, but will be avoided as much as possible. Prioritizing construction during the winter will further avoid and minimize temporary crossing impacts. Crossing of larger streams and rivers, such as the North Branch Dead River, Alder Stream, Tim Brook, South Branch Dead River, Nash Stream and Stoney Brook, will not occur, as these areas will be approached from both banks. Several other stream crossings will also be avoided if access to either side of the stream is good or if the streams are associated with wetlands that will be difficult to cross (e.g., deep organic soils, extensive surface water).

Table 11-8 Streams Crossed by the Proposed Transmission Line ROW

Milepost	Name	LURC Sub-district	Assoc. Wetl.	Width (Feet)	Stream Type (Perennial Or Intermittent)	Substrate / Bank Type	Construction Restrictions, Special Site Conditions, Additional Comments
0.04	D24-1	P-SL2	D-24	3	Intermittent	peat-muck, silt-mud, sand	forestry activities diverted streams
0.09	D24-2	P-SL2	D-24	2	Intermittent	silt-mud, sand	forestry activities diverted streams
0.43	D28	P-SL2	D-28	5	Perennial	gravel/cobble, boulder	several waterfalls, steep valley cut; no construction access across this stream
0.63	D32-1	P-SL2	D-32	2	Perennial	sand, gravel/cobble	
1.06	C138	P-SL2	C-138	2	Intermittent	silt-mud, sand, gravel/cobble, boulder	
1.16	C137	P-SL2	C-137	5	Perennial	gravel/cobble	
1.20	C136	P-SL2	N/A	3	Intermittent	gravel/cobble	
1.25	C134-1	P-SL2	C-134	2	Intermittent	gravel/cobble	
1.26	C134-4	P-SL2	C-134	1.5	Intermittent	sand	
2.11	C130-2	P-SL2	N/A	1	Intermittent	gravel/cobble	
2.12	C130-1	P-SL2	N/A	4	Perennial	bedrock	
2.44	C128-1	P-SL2	C-128	3	Perennial	sand, gravel/cobble	braided stream channels
2.45	C128-2	P-SL2	C-128	3	Perennial	sand, gravel/cobble	braided stream channels
2.64	C127	P-SL2	N/A	2	Intermittent	sand	
2.83	A123	P-SL2	C-123	1.5	Intermittent	sand	
3.45	B152-1	P-SL2	B152	1	Perennial	sand, boulder	
3.47	B152-2	P-SL2	B152	1	Intermittent	sand, boulder	
3.99	B151-2	P-SL2	B151	1	Intermittent	peat-muck, silt-mud	
4.00	B151-1	P-SL2	B151	1	Intermittent	sand, boulder	stream ends in grassy pool
4.86	B145-1	P-SL2	B145	20	Perennial	gravel/cobble, boulder	possibly mink present and probable trout stream; no construction access across this stream
4.89	B145-2	P-SL2	B145	10	Intermittent	gravel/cobble, boulder	overflow channel
5.24	B140	P-SL2	B140	1	Intermittent	peat-muck, gravel/cobble, boulder	
5.29	Northwest Inlet. B138	P-SL2	B138	30	Perennial	boulder	waterfall downstream
6.01	B133	P-SL2	B133	3	Intermittent	boulder	braided channel
6.50	B130	P-SL2	B130	3.5	Intermittent	silt-mud	
7.15	Viles Brook B127	P-SL2	B127	7	Perennial	sand, gravel/cobble	old beaver activity; construction access across this stream on existing bridge (Viles Pond Road)

Milepost	Name	LURC Sub-district	Assoc. Wetl.	Width (Feet)	Stream Type (Perennial Or Intermittent)	Substrate / Bank Type	Construction Restrictions, Special Site Conditions, Additional Comments
7.35	North Branch Dead River B124	P-SL2	B124	55	Perennial	gravel/cobble, boulder	*Listera auriculata* on s. bank; beaver activity, trout stream; no construction access across this river
8.04	B118-2	P-SL2	B118	3.5	Perennial	silt-mud, sand	beaver activity; deep organic soils in adjacent wetland; no construction access across this stream
8.10	B118-1	P-SL2	B118	7-10	Perennial	sand, gravel/cobble	deep organic soils in adjacent wetland; no construction access across this stream
9.08	B113-3	P-SL2	B113	4	Intermittent	sand, gravel/cobble	int. tributary; no construction access across this stream
9.11	Alder Stream B113-2	P-SL2	B113	70	Perennial	sand, gravel/cobble	no construction access across this stream
9.14	B113-1	P-SL2	B113	15	Perennial	gravel/cobble	oxbow not connected to Alder Stream; no construction access across this stream
10.71	B105	P-SL2	B105	3	Perennial	silt-mud	wading bird habitat present
11.46	Barnard Brook B101	DEP jurisdiction	B101	5	Perennial	silt-mud, gravel/cobble	fish present
12.73	Sawyer Brook B96-1	DEP jurisdiction	B96	8	Perennial	silt-mud	tadpoles, frogs, and fish present
13.07	Tim Brook B157	DEP jurisdiction	B157	30	Perennial	gravel/cobble, boulder	*Listera auriculata; Pyrola minor*; no construction access across this stream
13.87	B163-2	DEP jurisdiction	B163	2	Intermittent	peat-muck, silt-mud, sand	
13.88	B163-1	DEP jurisdiction	B163	4	Intermittent	sand, gravel/cobble	meandering stream, several possible routes at peak flow
15.72	Lutton Brook C174	DEP jurisdiction	C174	5	Perennial	sand	
15.96	A174-4	DEP jurisdiction	A174	4	Perennial	sand, gravel/cobble	flows into channel A174-8, some area had no flow; no construction access through this stream and wetland complex
15.97	A174-1	DEP jurisdiction	A174	8-12	Perennial	sand, gravel/cobble, boulder	no construction access through this stream and wetland complex
15.97	A174-2	DEP jurisdiction	A174	5-10	Perennial	sand, gravel/cobble, boulder	flows into channel A174-1; no construction access through this stream and wetland complex

Milepost	Name	LURC Sub-district	Assoc. Wetl.	Width (Feet)	Stream Type (Perennial Or Intermittent)	Substrate / Bank Type	Construction Restrictions, Special Site Conditions, Additional Comments
15.97	A174-3	DEP jurisdiction	A174	2.5	Intermittent	sand, gravel/cobble	flows into channel A174-2; no construction access through this stream and wetland complex
16.21	A172	DEP jurisdiction	A172	2.5	Intermittent	sand, gravel/cobble	construction access across stream on existing gravel road
16.27	A171-1	DEP jurisdiction	A171	1	Intermittent	gravel/cobble	
16.27	A171-2	DEP jurisdiction	A171	2	Intermittent	gravel/cobble	construction access across stream on existing gravel road
16.34	A170-1	DEP jurisdiction	A170	2	Intermittent	gravel/cobble	no construction access across this stream
16.41	A170-2	DEP jurisdiction	A170	1	Intermittent	silt-mud, gravel/cobble	no construction access across this stream
17.42	A165	DEP jurisdiction	A165	30	Perennial	peat-muck, silt-mud	flows out of wetland, vernal pool, beaver activity; no construction access across this stream
17.80	A160	DEP jurisdiction	A160	1.5	Intermittent	sand, gravel/cobble	
18.06	A154	DEP jurisdiction	A154	15	Intermittent	silt-mud, sand, gravel/cobble	stream appears to have been widened; construction access across this stream on existing gravel road
19.46	South Branch Dead River A147-1	DEP jurisdiction	A147	100	Perennial	gravel/cobble, boulder	with int. tributary flowing out of wetland; no construction access across this stream
19.54	A149	DEP jurisdiction	A149	15	Intermittent	silt-mud	beaver activity; no construction access across this stream
20.10	Nash Stream A142-1	DEP jurisdiction	A142	20	Perennial	gravel/cobble	fish present; no construction access across this stream
21.16	A135	P-SL2	A135	5.5	Perennial	silt-mud, gravel/cobble	beaver activity; no construction access across this stream
21.8	B72-1	P-SL2	B72	1	Perennial	silt-mud/sand	no construction access across this stream
23.81	B79	P-SL2	N/A	2	Perennial	gravel/cobble	frogs present
24.07	B83-1	P-SL2	B83	7	Perennial	boulder	trout present
24.39	B85	P-SL2	B85	3.5	Perennial	silt-mud, sand	wood frog present
24.67	B88	P-SL2	B88	2	Intermittent	silt-mud, sand	
24.94	B91	P-SL2	B91	1.5	Intermittent	silt-mud	

Milepost	Name	LURC Sub-district	Assoc. Wetl.	Width (Feet)	Stream Type (Perennial Or Intermittent)	Substrate / Bank Type	Construction Restrictions, Special Site Conditions, Additional Comments
24.97	B92-1	P-SL2	B92	4	Perennial	Sand, gravel/cobble, boulder	
24.97	B92-2	P-SL2	B92	5	Perennial	sand, gravel/cobble, boulder	trout present
25.15	B93-1	P-SL2	B93	1.5	Intermittent	sand, gravel/cobble	
25.15	B93-2	P-SL2	B93	4	Intermittent	sand, gravel/cobble	
25.27	A130	P-SL2	A130	2-6	Perennial	silt-mud, gravel/cobble, boulder	
25.51	A129	P-SL2	A129	3	Intermittent	gravel/cobble	
26.00	A124	P-SL2	A124	3	Intermittent	gravel/cobble/boulder	
26.30	Stoney Brook A118	P-SL2	A118	35-40	Perennial	gravel/cobble, boulder	no construction access across this stream
26.55	A116-2	P-SL2	A116	6	Intermittent	gravel/cobble	
26.58	A116-1	P-SL2	A116	1	Intermittent	sand, boulder	
26.69	A115	P-SL2	N/A	4	Perennial	gravel/cobble	insect larvae present
26.76	A114-3	P-SL2	A114	10	Intermittent	gravel/cobble, boulder	
26.77	A114-2	P-SL2	A114	10	Intermittent	gravel/cobble, boulder	
26.81	A114-1	P-SL2	A114	9	Intermittent	gravel/cobble, boulder	
27.21	B1	P-SL2	B1	1	Intermittent	sand	wood frog present
Total Feet Stream Crossing			***681.5***				

11.5 Impacts to Functions and Values

An assessment of the functions and values provided by wetlands in the Project area was performed in accordance with the USACE qualitative, descriptive approach to wetland assessment described in "The Highway Methodology Workbook Supplement, Wetland Functions and Values – A Descriptive Approach." Each wetland was described during the field delineation process, and those features relevant to the wetland's functions and values were recorded. Wetland functions and values are described as follows:

> *Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society. Functions result from both living and non-living components of a specific wetland. These include all processes necessary for the self-maintenance of the wetland ecosystem such as primary production and nutrient cycling, among others. Therefore, functions relate to the ecological significance of wetland properties without regard to subjective human values.*
>
> *Values are benefits to society that derived from one or more functions and the physical characteristics associated with a wetland. The value of a particular wetland function, or*

combination thereof, is based on human judgment of the worth, merit, quality, or importance attributed to these functions.

The USACE Regulatory Branch has identified eight functions and five values to be addressed during wetland permit review. The eight functions are: groundwater recharge/discharge; floodflow alteration and desynchronization; fish and shellfish habitat; sediment/toxicant/ pathogen retention; nutrient removal/retention/transformation; nutrient export; sediment/shoreline stabilization; and wildlife habitat. The five values are: recreation; educational/scenic value; uniqueness/heritage; visual quality/aesthetics; and threatened or endangered species habitat.

All wetlands identified were also classified in the field using the USFWS classification system. This is a hierarchical system that categorizes wetlands based on physical and ecological characteristics. Wetlands encountered in the project area consisted of three types: PFO, PSS, and PEM. Several riverine components of wetlands were also identified and mapped as intermittent or perennial; all were associated with a mapped and classified palustrine wetland. Lacustrine wetlands were not encountered within the survey areas. Vernal pools were described in terms of physical characteristics and apparent breeding habitat, and are discussed in Section 11.6. In general, wetlands of each cover type were very similar across the Project area, with some differences in characteristics on the ridgelines. The functions and values of the wetlands encountered are described below for each wetland classification (categorized as primary or secondary; non-applicable functions and values are not described). The anticipated impact of the Project on the functions and values is then described for each wetland type.

Project wetland impacts are of three types: temporary construction crossings; conversion impacts; and limited wetland fill. Temporary impacts (wetland crossing using equipment mats) will be undertaken with appropriate BMPs to ensure that restoration to approximate original conditions will occur following the construction effort. No long-term or permanent change to wetland functions or values is anticipated to result from temporary construction impacts. Permanent impact will result from conversion of PFO to PSS wetlands to accommodate vegetation clearance requirements along the 115 kV transmission line. However, because much of the Project is located within working forest, clearing and regeneration is a common occurrence. Also, there is an abundance of forested wetlands in the area, and most of the PFO wetlands will only experience conversion to PSS partially (only within the proposed right-of-way) since many extend beyond the proposed right-of-way limits. Finally, most of the functions and values of the PSS wetlands along the transmission corridor are the same as for the existing PFO wetlands. No significant impacts to overall wetland functions and values are anticipated to result from cover type conversion. Permanent impacts will result to several of the wetlands through filling, but total fill impacts are small (about 0.4 acre) and limited in scope and area, and not anticipated to produce a significant adverse impact on the wetland functions and values. It is important to note that many of the wetlands and some of the streams observed and mapped within the proposed Project area have been previously impacted by human activities, primarily

by wood harvesting and associated building of access roads in proposed ROW areas, and by ATV traffic on existing right-of-way.

11.5.1 Palustrine Forested Wetlands

Forested wetlands (PFO) are characterized by woody vegetation at least 6 meters tall, and are the most common wetland type found in the project area. PFO wetlands comprise about 55 percent of the total area of wetlands identified. Most PFO wetlands were further classified in the field as broad-leaved deciduous and/or needle-leaved evergreen.

Primary functions of PFO wetlands include groundwater discharge, food chain functions such as nutrient removal and production export, and wildlife habitat. Most of the forested wetlands provide some amount of groundwater discharge. This function is primary for some wetlands and secondary for others. Wetlands on hillsides typically have the potential to discharge groundwater at their lower elevations. Wildlife habitat in the forested wetlands includes avian species that use trees for nesting and foraging. Production export is the generation and recycling of nutrients by plant growth and decomposing biotic matter. The productivity and structure of these habitats supports a variety of breeding and wintering species, can provide winter cover for deer, and provides habitat for nesting passerine birds.

Secondary functions of PFO wetlands include sediment and toxicant removal and recreation values. Sediment and toxicant retention can be provided by those wetlands adjacent to paved and dirt roads (a very small portion of the wetlands in the proposed project area). Recreational values, such as for hunting, are likely provided by these wetlands. Access to many of these wetlands is difficult given the distances from roads.

The principal impact to PFO wetlands will be the conversion from forested to PSS (or PEM) by the clearing of trees to meet conductor clearance requirements along the 115 kV transmission line corridor (total 37.02 acres). In addition, 0.11 acres of PFO will be permanent impacted by turbine access road construction, and 0.004 acres of PFO will be permanently impacted by placement of structures and/or anchors along the 115 kV transmission corridor. Clearing the canopy vegetation and maintaining these wetlands as herbaceous or shrub communities will not adversely affect the wetland functions and values; in fact, groundwater discharge may be increased with a reduction in canopy due to the associated reduction in evapotranspiration. Cover type conversion will favor species that use early successional habitat. It could adversely affect winter cover and some canopy-dwelling species. Clearing will not likely have a significant effect on sediment and toxicant removal or recreation values. Sediment/toxicant retention and removal is afforded largely by the very slow rate of water movement through the wetland and by the adsorptive and absorptive characteristics of both the soil and the biota, which will not change significantly when PFO wetland is converted to PSS. Recreational values will also likely not be negatively impacted because deer and other game species utilize forest edges and shallow water areas that may be created.

11.5.2 Palustrine Scrub-Shrub Wetlands

PSS wetlands are characterized by woody vegetation less than 6 meters tall. These wetlands in the Project area are typically dominated by shrubs, young trees, grasses, and herbaceous plants, but may also include sparse older trees that are stunted due to environmental conditions. Scrub-shrub wetlands within the proposed 115 kV transmission line area occur as four general types: scrub-shrub wetlands associated with small streams; scrub-shrub wetlands associated with large streams; scrub-shrub wetlands in early-successional stages due to recent tree harvesting or managed within electrical rights-of-way (the most common occurrence of scrub-shrub wetlands in the project area), and; natural early successional habitat surrounded by upland and wetland forests. Approximately 38 percent of the total area of wetlands identified within the project area are scrub-shrub wetlands. Scrub-shrub wetlands are structurally similar to other early successional forest habitats. However, they generally have a greater diversity and abundance of wildlife species due to the seasonal presence of water and abundance of early successional vegetation. Shallow ponding was observed in some PSS wetlands, and was likely seasonal.

The primary functions provided by PSS wetlands are groundwater discharge, floodflow alteration, nutrient removal and production export, sediment stabilization, and wildlife habitat. The primary value provided is recreation. Groundwater discharge is typically provided in PSS wetlands by the accumulation of groundwater in the soil and its subsequent discharge to the ground surface and to the streams. Floodflow alteration is provided at some scrub-shrub wetlands in flat areas along larger stream channels; wrack lines of debris were visible in many of these wetlands. For scrub-shrub wetlands proximate to smaller streams and set back from stream areas, this function is not provided. Production export is a function common to all of the PSS wetlands; for wetlands along streams, export of nutrients to the stream ecosystems via detritus is a particularly valuable function. Sediment/shoreline stabilization is only provided by riparian scrub-shrub wetlands that have a dense growth of vegetation. Wildlife habitat is also a typical function provided by PSS wetlands. Stream corridors are commonly used as travel corridors by many wildlife species, and also provide food. PSS wetlands adjacent to streams provide excellent habitat for many avian species including waterfowl, raptors, wading birds, and passerines. Scrub-shrub wetlands remote from streams also provide wildlife habitat function. Certain PSS wetlands in the higher elevations on the ridgelines have the potential to serve as habitat for boreal bedstraw (*Galium kamtschaticum*), a state listed rare (S2) plant species. This species was observed in wetlands on both ridges outside of the Project construction area, and was found in the B Series PSS wetland A-180. Evidence of recreation was not observed, but it is presumed that some wetlands provide value for hunting and/or fishing.

Some PSS wetlands in the Project area will be impacted by filling for access roads or transmission line structures. A total of 0.19 acre of PSS will be permanently impacted by turbine access road construction, and 0.02 acre will be permanently impacted by the construction of 115 kV transmission line structures or structure anchors. All but one of the wetland impacts will consist of encroachment into edges of larger wetlands or crossing of

wetlands by access roads, with continuity provided by appropriate culverts. This minor and incremental impact is not anticipated to have a significant effect on the overall functions and values provided by the wetlands in and around the Project area.

11.5.3 Palustrine Emergent Wetlands

PEM wetlands are characterized by erect, rooted, herbaceous hydrophytes (excludes mosses and lichens). Emergent wetlands include areas commonly referred to as marshes and wet meadows, though most of the emergent wetlands in the right-of-way areas are wet meadow communities. Also, beaver activity has created some areas of extensive emergent wetlands. PEM wetlands generally consist of openings in the forest canopy containing standing water. The proposed 115 kV transmission line area crosses very few areas classified solely as emergent wetlands, because they are usually intergraded with scrub-shrub wetlands. Approximately 6 percent of the total area of wetlands within the proposed Project area are emergent wetlands. Many of these emergent areas have been created by ground disturbance during forest management activity.

The primary functions provided by emergent wetlands are groundwater discharge and wildlife habitat. Groundwater discharge occurs with the accumulation of shallow groundwater in the soil and its intersection with the ground surface, an especially common occurrence in the lower elevations. Wildlife habitat is provided by emergent wetlands by supporting aquatic life stages and providing forage and cover for other species. Secondary functions provided by this wetland type are production export and recreation. Production export is provided by the recycling of nutrients from growth and decomposition of biotic matter as part of the biological food chain. These wetlands also have the potential to provide recreational opportunities, although no paths or evidence of human activity were found.

A total of 0.02 acres of PEM will be impacted by the construction of turbine access roads only. Some of these will be impacted on their edges, and others crossed at narrow points and culverted. These minor impacts are not anticipated to have a significant effect on the overall functions and values provided by the PEM wetlands in and around the Project area.

11.6 Vernal Pools

Vernal pool field surveys were conducted in the anticipated Project impact areas in May 2006; additional surveys were performed in May 2007. A draft protocol for the field survey effort was prepared and distributed to MDIFW, LURC, and USFWS on April 27, 2006. Information and procedures utilized for this protocol were consistent with current agency consensus, and all comments received on the draft protocol were incorporated into the final version. Consistent with protocol requirements, all vernal pool field surveys were conducted between May 3, 2006 and May 19, 2006, and between May 15, 2007 and May 25, 2007, within appropriate conditions for such survey efforts.

The Maine Natural Resources Protection Act (NRPA) Chapter 335 defines a vernal pool as follows:

> "A v*ernal pool, also referred to as a seasonal forest pool, is a natural, temporary to semi-permanent body of water occurring in a shallow depression that typically fills during the spring or fall and may dry during the summer. Vernal pools have no permanent inlet and no viable populations of predatory fish. A vernal pool may provide the primary breeding habitat for wood frogs (Rana sylvatica), spotted salamander (Ambystoma maculatum), blue-spotted salamanders (Ambystoma laterale) and fairy shrimp (Eubranchipus* sp.*), as well as valuable habitat for other plants and wildlife including several rare, threatened, and endangered species. A vernal pool intentionally created for the purposes of compensatory mitigation is included in this definition."*

A total of 33 potential vernal pools were identified within ridgeline and transmission right-of-way areas. The function of each pool was assessed using criteria that included the pool's origin (man-made or natural), biological value (number of vernal pool species egg masses), and the condition of the critical terrestrial habitat (percentage of cleared area) (Calhoun and Klemens, 2002). Most (23 of 33) of the pools were man-made in origin (ruts made by forest harvesting equipment, and ditches next to logging roads). Function levels were assigned consistent with Wetland Evaluation Technique (WET) qualitative probability ratings (Adamus et al. 1987). Table 11-9 shows this matrix.

Table 11-9 Vernal Pool Functional Assessment Matrix

Pool Type	25 or More Vernal Pool Species Egg Masses	Less than 25 Vernal Pool Species Egg Masses
Man-made, greater than 25% of critical terrestrial habitat cleared	Moderate	Low
Man-made, less than 25% of critical terrestrial habitat cleared	Moderate	Low
Natural, greater than 25% of critical terrestrial habitat cleared	Moderate	Low
Natural, less than 25% of critical terrestrial habitat cleared	High	Moderate

Significant vernal pools were identified according to the criteria of Maine NRPA Chapter 335. In general, a vernal pool habitat in Maine is "significant" if it is natural in origin, has a high habitat value for vernal pool species, either because a state-listed threatened or endangered species, such as a spotted turtle, uses it to complete a critical part of its life history, or there is a certain abundance of obligate vernal pool species: spotted salamander (20 egg masses); blue spotted salamander (10 egg masses); wood frog (40 egg masses); or fairy shrimp (presence). Two

vernal pools in the Project area were determined to be significant per the DEP Chapter 335 definition: C3 and A121.

Vernal pool C3 was identified, mapped, and surveyed on May 19, 2006. The pool dimensions were 60 feet x 45 feet and water depth was approximately 12 inches when observed; the high water line, or spring maximum water level was estimated to be approximately 24 inches. The pool is in a forested setting; approximately 90 percent of the surrounding habitat is hardwood forest with greater than 50 percent canopy cover. The pool is adjacent to a gravel road, which makes up the remainder of habitat found around the pool. The level of existing disturbance to the pool and surrounding habitat is low, and is primarily from ditching associated with road maintenance. Within the pool, plant cover was made up of woody debris and tree trunks. Leaves made up 95 percent of the cover on the bottom of the pool, and moss made up the remainder of cover. At the time of the survey in 2006, there was one wood frog egg mass and seven spotted salamander egg masses. Vernal pool C3 was resurveyed on May 24, 2007, and 10 wood frog masses and 33 spotted salamander egg masses were observed, identifying this pool as a significant vernal pool per the state definition. This pool's function is high because it is a natural pool with a large number of vernal pool species egg masses.

Vernal pool A121 was identified, mapped, and surveyed on May 16, 2007. The pool dimensions are 64 feet x 35 feet and water depth was 3 feet when observed, with a similar high water line, or spring maximum water level. The pool is in a forested wetland complex with approximately 50 percent of the habitat around the pool being mixed forest with a moderate (25% to 50%) canopy cover over 6 feet. The remaining habitat is an existing electric right-of-way with plant cover composed of shrubs, grasses, and forbs. No disturbance exists next to the pool, and the surrounding habitat has little disturbance from the right-of-way. Within the pool, plant cover is made up of 25 percent emergent vegetation and 5 percent woody debris. Leaves make up 70 percent of the cover on the bottom of the pool. At the time of the survey in 2007, there were 75 wood frog egg masses and 42 spotted salamander egg masses, identifying this pool as a significant vernal pool per the state definition. This pool's function is high primarily because it is a natural pool with a large number of vernal pool species egg masses with less than 25 percent of the critical habitat in a cleared state.

The Project will not directly impact the vernal pool depressions. The 115 kV overhead transmission line right-of-way will require clearing of mature trees and maintenance of tree and shrub growth to a maximum height of 8 to 10 feet within the right-of-way. The forest habitat outside of the right-of-way corridor will be maintained undisturbed by the Project. The right-of-way corridor at vernal pools C3 and A121 is 125 feet wide due to its adjacency to the existing Boralex transmission right-of-way.

A 750-foot radius from the spring high-water mark of each pool was used to assess potential impacts of the transmission line on the upland habitat surrounding the pool, based on USACE criteria. For both state-significant vernal pools, a minimum of 75 percent of the 750-foot radius upland habitat will be preserved as undisturbed habitat.

The total area within the 750-foot radius around vernal pool C3 is 46.30 acres. The existing development (cleared canopy for the existing Boralex transmission right-of-way) is 2.06 acres; the proposed canopy area to be cleared is 4.47 acres. The combined development area within the 750-foot radius will therefore be 6.53 acres, or 14.1 percent of the 750-foot vernal pool habitat area around pool C3.

The total area within the 750-foot radius around vernal pool A121 is 42.43 acres. The existing development is 4.78 acres; the proposed canopy area to be cleared is 4.48 acres. The combined development area will therefore be 9.26 acres, or 21.8 percent of the 750-foot vernal pool habitat area around pool A121.

In addition, the following proposed mitigation measures have been developed to protect these significant vernal pools, consistent with the intent of the guidelines of Calhoun and Klemens (2002) and Calhoun and de Maynadier (2004):

- Prior to clearing of trees (shrubs and small saplings will be left in place), 1) mark the boundaries of the vernal pool depression clearly with yellow "CAUTION" tape, and 2) mark the boundaries of the 100-foot buffer area ("vernal pool envelope" per Calhoun and Klemens [2002]).

- Prior to clearing, establish travel lanes for clearing and construction and mark them with distinctive flagging.

- Clear within 100 feet of the pool only during frozen or dry soils conditions in order to avoid creating ruts.

- Only "capable" species of trees taller than 6 feet, i.e., those that can grow to a height to contact electric conductors, will be removed from the 100-foot buffer. Non-capable trees and other vegetation will remain intact to the extent possible to provide pool shading and litter.

- Dead-down fallen logs within the 100-foot buffer area will be avoided and all trees that are felled within the 100-foot buffer area will be cut up and their limbs and tops will be left in place. This will be conducted in accordance with the Maine Slash Law.

- Minimize use of heavy equipment within the 100-foot buffer area.

- No pole structures will be placed within 100 feet of the pool.

- No herbicide use will be allowed in 100-foot buffer area.

- TransCanada's environmental inspector will be present during all clearing and construction activities in the area.

These measures should ensure that these natural pools continue to function and provide significant breeding habitat for vernal pool species.

11.7 Mitigation

The Project will result in approximately 0.4 acre of wetland fill. Other less direct wetland impacts include 7.54 acres of temporary construction impact associated with the use of equipment mats to minimize temporary impact in wetland areas, and the conversion of approximately 37.02 acres of forested wetland to scrub-shrub wetland within new transmission line right-of-way. As described in this application, temporary impact areas will be restored. No significant impact to overall wetland functions and values are anticipated in associated with project impacts. Given the small area of permanent wetland fill associated with the project, no compensatory mitigation has been proposed.

Note that TransCanada has entered into an agreement with other stakeholder entities that provide for significant preservation and protection of Maine's resources, including wetlands and other natural resource values. This agreement involves the commitment of funds towards the preservation of 750 acres of ecologically significant high elevation habitat in Maine's Mahoosuc Mountain range, as part of the Grafton Notch-Stowe Mountain acquisition. The agreement also focuses more closely to the project site by including the commitment that, if the Project moves forward, the two other ridgelines to which TransCanada has development rights (Caribou Mountain, or the C Series; and an unnamed ridge just south of Caribou Mountain, known as the D Series) will not be developed for wind power. Natural resources on those ridgelines are comparable, although in some respects more characteristic of high elevation areas in Maine, to the ridgeline sites being developed. TransCanada believes that additional mitigation specific to wetland compensation should not be necessary given the measures outlined in this application to avoid and minimize wetland impact.

12.0 WILDLIFE RESOURCES

Detailed information about wildlife is provided in Section 7 and Section V-5 of the Preliminary Development Plan application, as well as in supplemental materials filed throughout the review process. Through the detailed studies implemented, it has generally been determined that potential impact to wildlife resources will be acceptable. Post-construction monitoring plans (as outlined in Section 2.4.3) have been developed to confirm potential impact levels in several key areas. In addition to those plans for post-construction monitoring, confirmatory work is continuing in the following areas:

- Although completed tracking surveys for Canada lynx did not identify their presence, possible lynx tracks were noted (crossing Wahl Road, Mile 3.5 Road, and the lower end of the B-1 access trail) while TransCanada personnel were making regular visits to the Project area during the winter of 2008. Through consultation with MDIFW and USFWS, it has been determined that TransCanada will complete a formal habitat suitability assessment in Kibby Township as part of Endangered Species Act Section 7 review. This will include documentation of habitat suitability as well as information regarding the low anticipated travel associated with the Project once it is installed. The analysis and documentation is ongoing, and it is anticipated that the USFWS will issue a Section 7 finding that there will be no impact to lynx associated with the Project.

- As was done in May 2006 and May 2007, an aerial helicopter survey will be conducted in spring 2008 to continue to verify that bald eagle nests are not located along the 115 kV transmission line corridor. MDIFW will be invited to participate in these surveys.

- Mapped Inland Wading Bird and Waterfowl Habitat (IWWH) has been identified in several locations near and within the Project area, as described in Volume I, Section 7, and in Volume V, Section 5 of the Preliminary Development Plan application. MDIFW assessment of these areas has determined that they are low value habitat, and that no concern exists with regard to potential Project impact.

- The Project has been designed to avoid and minimize impacts to special status vegetation such as subalpine forest, late successional forest and specific vegetative species of concern. Correspondence from the Maine Natural Areas Protection Division (MNAP) on 9/27/06 and 6/19/07 confirms MNAP agreement that potential impacts to vegetation will be minimal. Specific measures are outlined in the Vegetation Management Plan (Appendix J) that will ensure species protection.

13.0 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

As part of the consultation process related to archaeological, historical and other tribal concerns, correspondence was sent to the Maine Historic Preservation Commission (MHPC), as well as the Penobscot Nation, the Passamaquoddy Tribe, the Aroostook Band of Micmac Indians, and the Houlton Band of Maliseet Indians. No correspondence identifying issues of concern was received from the native groups. Correspondence from the MHPC was also provided as a part of the Preliminary Development Plan approval that concurred that no further archaeological survey work is required for the proposed Project.

In the unexpected event that resources of cultural, historical or archaeological importance are encountered in the excavation process, construction-related work in the vicinity of the discovery will cease. The MHPC and the State Police, if appropriate, will be notified. An assessment of the area will then be conducted by a professional archaeologist. In the event that significant cultural resources are confirmed, potential measures will be identified to avoid or minimize adverse effects to those resources. The MHPC will be consulted throughout the investigation, and LURC staff will be informed of the status and results of the investigations.

14.0 ANTICIPATED PROJECT SOUND LEVELS

Noise is not anticipated to be a significant consideration, given the size of the property and distance from neighbors (the closest residence is 1.2 miles). However, TransCanada determined that a full noise analysis would be conducted to model turbine-related noise levels. The sound level analysis was conducted by Michael Theriault Acoustics, Inc., Portland, Maine, an expert in power generation and associated noise.

The noise analysis demonstrated that sound levels at the nearest receiver (approximately 1.2 miles from the nearest turbine) during favorable sound propagation conditions are expected to be approximately 35 dBA or less. Only a very few areas outside the proposed D-PD district would experience sound levels over 55 dBA.

Results of the acoustical analysis showed that Project noise levels are well within guidelines for acceptable levels of environmental noise within residential land uses. Noise levels generated during operation of the proposed Project are expected to have an insignificant impact with respect to potential hearing damage, sleep or indoor/outdoor speech interference, with no discernable change in noise levels at the nearest residential receptor. Given these findings, noise levels generated during operation of the Project are expected to be insignificant.

The noise analysis indicates that a 55 dBA sound level from the combined turbines is generally maintained within the approved D-PD zone boundaries. Figure 14-1 illustrates the areas modeled to be at 55 dBA in comparison to the approved D-PD zone. Therefore, outside of the approved D-PD zone, sound levels will be lower. While noise levels are predicted to exceed 55 dBA in a few locations outside the D-PD zone, the surrounding land is owned by Plum Creek, the co-applicant on the petition to rezone, and is used for commercial harvesting activities that will not be adversely impacted by noise from the wind turbines.

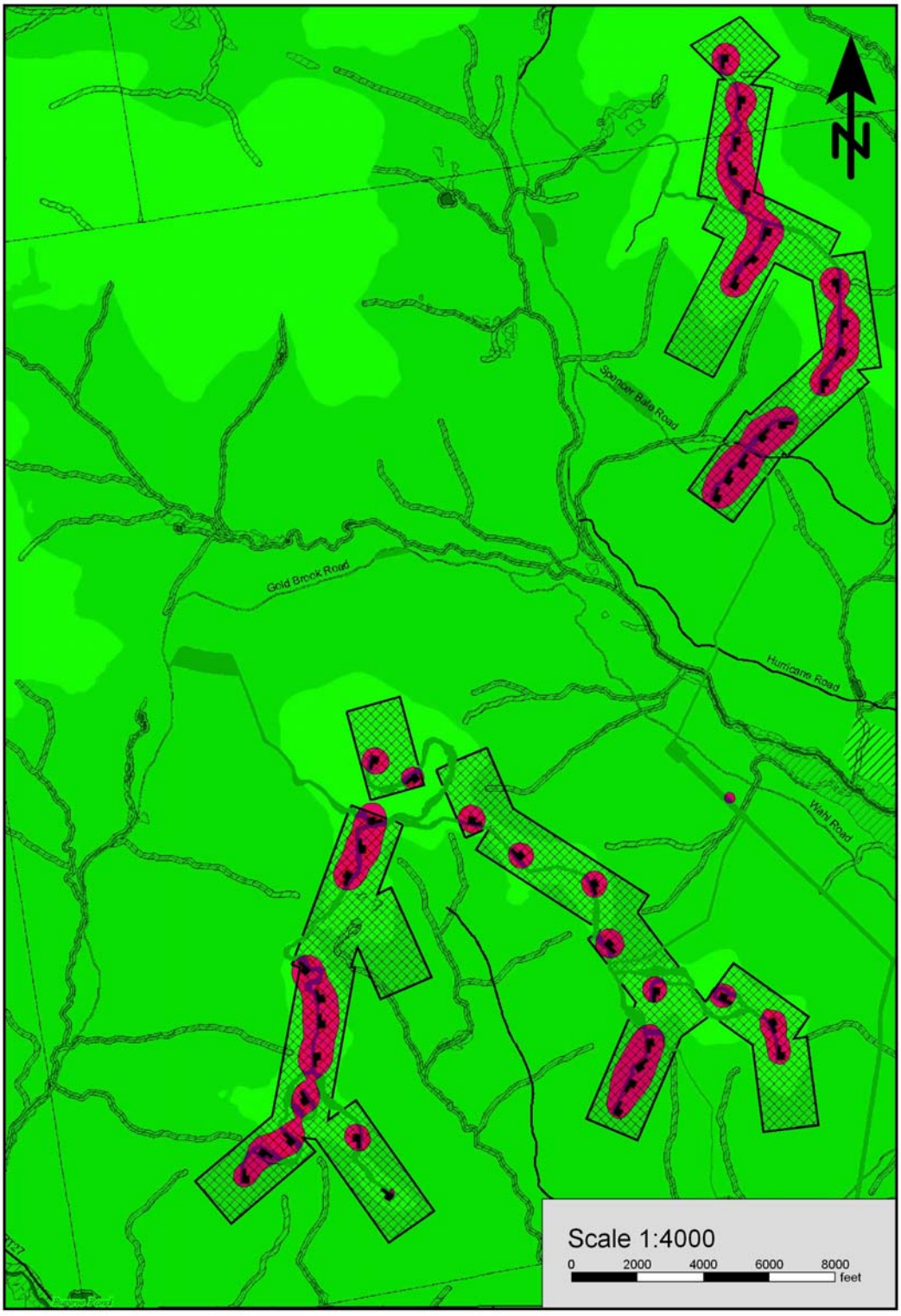


Figure 14-1: Anticipated Project Sound Levels

15.0 DECOMMISSIONING

Due to the continuing need for low cost zero-emission power, it is expected that the Kibby Wind Power Project would be repowered at the end of its expected 25 year life, thus extending its operating period for an additional 25 years or more. While the moving parts in the turbines are subject to wear and tear over their expected life, the non-moving parts, including the collector system, turbine pads and transmission line are expected to have an almost limitless life with proper maintenance. For the turbines themselves, design improvements should be expected that would justify replacing the current model with a newer, more efficient one at the end of the 25 year period.

During its initial 25 year period, a wind project is expected to have a high market value, since the capital costs of the project have been made and the operating costs are extremely low. Thus, the Project should never be required to be dismantled or decommissioned during that period.

If, in the unlikely event the Project should be required to be decommissioned, the market value of the turbines – whether as complete units or as parts – would be expected to be high, as the demand for wind projects is expected to remain strong for the foreseeable future. Nevertheless, in the unlikely event that the Project had to be decommissioned, TransCanada would take all appropriate steps and make available the necessary funds to ensure that the towers and associated infrastructure were removed and appropriately disposed of.

Decommissioning of the Project would consist of the dismantlement, removal and appropriate disposal of:

- The nacelles, blades, and towers;
- All aboveground collector system structures;
- The substation; and
- The portion of the transmission line between the Project and the Bigelow Substation that is not used by others.

The removal activities would occur in accordance with all regulatory standards in place at that time to minimize potential environmental or other impacts.

It is difficult to accurately estimate the costs necessary to decommission a wind project in the future and, as noted above, it is likely that a project would be repowered instead of decommissioned. However, TransCanada appreciates that the LURC has voiced concerns in the past over decommissioning of wind farm s and associated met towers, and is committed to providing the necessary assurances that funds will be available for decommissioning activities should that need arise.

As a result, TransCanada Corporation, the parent entity, will put in place a parental guaranty (substantially in the form of the parental guarantee provided in Appendix V) to fund the necessary decommissioning activities associated with the Project. TransCanada has over $20 billion of assets and an "A" credit rating. Should TransCanada's Guarantor credit rating ever fall below investment grade, TransCanada will provide a Letter of Credit from a financial institution of investment grade standing; the substantial form of the Letter of Credit is also provided in Appendix V. The amount of the Letter of Credit would be based on the net cost (after consideration of the value of the turbines or parts) of decommissioning the wind farm and associated facilities. This cost would be determined by a qualified third-party engineering firm that is mutually acceptable to both LURC and TransCanada.

Further, TransCanada will submit a detailed decommissioning plan and schedule no later than: (1) 60 days after the date the Project ceases to generate electricity as set forth in a written notice from TransCanada to LURC stating an intention to cease electrical generation at the Project; or (2) if no such notice has been provided and the Project has not generated electricity for six consecutive months for reasons that are outside of the direct control of TransCanada, 60 days after the date TransCanada receive a written request from LURC to decommission the Project, unless TransCanada can demonstrate to LURC's reasonable satisfaction a plan to recommence generation of electricity.