Public Utilities Commission
Route Permit Amendment Request

Plum Creek Wind Farm, LLC

Cottonwood, Murray, and Redwood Counties, Minnesota

Docket No. IP6997 / TL-18-701

February 2025

8400 Normandale Lake Boulevard
Suite 1200
Bloomington, MN 55437

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ACRONYM LIST

Acronym	Definition
2021 Route Permit	Route Permit issued by the Minnesota Public Utilities Commission for the 345-kilovolt transmission line associated with the Plum Creek Wind Project on September 23, 2021, under Docket Number IP6997/TL-18-701.
2021 Site Permit	Site Permit issued by the Minnesota Public Utilities Commission for the Plum Creek Wind Project on September 23, 2021, under Docket Number IP-6997/WS-18-700.
2023 Site Permit	Site Permit issued by the Minnesota Public Utilities Commission for the Plum Creek Wind Project on July 5, 2023, under Docket Number IP-6997/WS-18-700.
ACS	American Community Survey
AM	Amplitude Modulation
APLIC	Avian Power Line Interaction Committee
Applicant	Plum Creek Wind Farm, LLC
BESS	battery energy storage system
BWSR	Board of Soil and Water Resources
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Commission	Minnesota Public Utilities Commission
CREP	Conservation Reserve Enhancement Program
CSAH	County State Aid Highway
dBA	A-weighted decibels
DOD	U.S. Department of Defense
EERA	Energy and Environmental Review and Analysis
EPA	U.S. Environmental Protection Agency
FEIS	Final Environmental Impact Statement prepared by the Department of Commerce Energy Environmental Review and Analysis to evaluate the potential effects of the Plum Creek Project that was issued on April 12, 2021.
gen-tie line	generation tie line
GHG	greenhouse gas
GIS	geographic information system
GPS	Global Positioning System
HUC	Hydrologic Unit Code
HVTL Project	Plum Creek Wind Farm, LLC's proposed 345 kV transmission line
IPaC	Information for Planning and Conservation
kV	kilovolt
MDH	Minnesota Department of Health
Minn. R. Ch.	Minnesota Administrative Rules chapter

Acronym	Definition
Minn. Stat. §	Minnesota Statute section
MDNR	Minnesota Department of Natural Resources
MNDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
MW	megawatt
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NG Renewables	National Grid Renewables Development, LLC
NHIS	Natural Heritage Information System
NO_2	nitrogen dioxide
November 2019 Application	Route Permit Application for the HVTL Project submitted on November 8, 2019, under Docket No. IP6997 / TL-18-701.
NO_X	nitrogen oxides
NRCS	Natural Resources Conservation Service
O_3	ozone
Pb	lead
Permitted Route Segment	A 1,000-foot-wide route along the southern approximately 7.5 miles of the HVTL Project currently ordered by the 2021 Route Permit.
Plum Creek	Plum Creek Wind Farm, LLC
Plum Creek Project	The up to 414 megawatt Plum Creek Wind Farm and 345 kV high voltage transmission line proposed by Plum Creek Wind Farm, LLC.
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
POI	Point of Interconnection
Preferred Route Segment	Approximately 4.1-mile-long, 1,000-foot-wide optimized route segment that will connect Collector Substation 2 to the revised location of Collector Substation 1
Revised Collector Substation 1	revised location of Collector Substation 1
RPAR	Route Permit Amendment Request
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SOBS	Sites of Biodiversity Significance
SPAR	Site Permit Amendment Request
SSURGO	Soil Survey Geographic Database
SWPPP	Stormwater Pollution Prevention Plan
Tetra Tech	Tetra Tech, Inc.
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

Acronym	Definition
USGS	U.S. Geological Survey
Wind Project	Plum Creek Wind Farm Project

1.0 AMENDMENT REQUESTED

On September 23, 2021, the Minnesota Public Utilities Commission (Commission or MPUC) issued a Route Permit authorizing Plum Creek Wind Farm, LLC (Plum Creek or Applicant) to construct and operate a new 31-mile single-circuit 345 kilovolt (kV) transmission line between a new collector substation in Ann Township, Cottonwood County and a new switching station in Vesta Township, Redwood County.

Plum Creek, a wholly owned subsidiary of National Grid Renewables Development, LLC (NG Renewables), respectfully submits this request for a Route Permit Amendment (RPAR) for the 345 kV high voltage transmission line (HVTL Project) to change the southern approximately 7.5 miles of the HVTL Project (the Permitted Route Segment) to a shorter, more direct approximately 4.1-mile-long route segment (the Preferred Route Segment). Plum Creek also requests an extension of the Route Permit term to allow construction to begin as late as fall 2027 with an in-service date of December 2028. Plum Creek submits this RPAR to the Commission pursuant to Minnesota Statute section (Minn. Stat. §) 216E and Minnesota Administrative Rules chapter (Minn. R. Ch.) 7850. An assessment of compliance with the routing factors under Minn. R. Ch. 7850.1900, Subp. 3 is provided in Appendix A.

The HVTL Project is associated with the up to 414 megawatt (MW) Plum Creek Wind Farm Project (Wind Project) in Cottonwood, Murray, and Redwood Counties, Minnesota (collectively, the Plum Creek Project) and consists of an approximately 31-mile-long single-circuit 345 kV generation tie line (gen-tie line) and associated facilities (i.e., the Switching Station) that will connect the Wind Project to the existing Brookings-to-Hampton 345 kV transmission line in Redwood County, Minnesota, the Point of Interconnection (POI) for the Plum Creek Project.

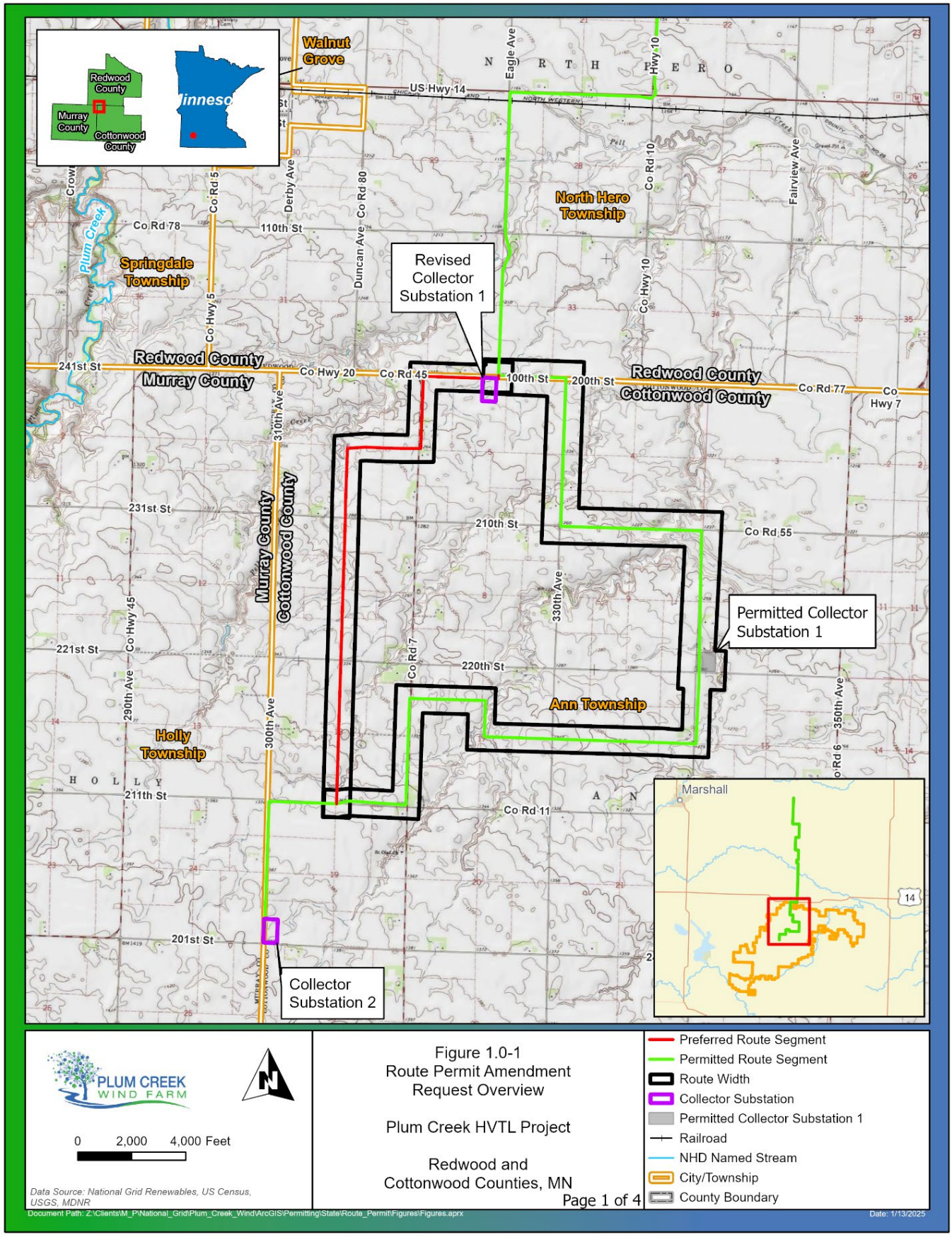
Plum Creek received a Certificate of Need, a Site Permit (2021 Site Permit), and a Route Permit (2021 Route Permit) for the Plum Creek Project from the Commission on September 23, 2021, under Docket Nos. IP6997/CN-18-699, IP-6997/WS-18-700, and IP6997/TL-18-701, respectively. The Department of Commerce Energy Environmental Review and Analysis (EERA) evaluated the Certificate of Need for the Plum Creek Project and the potential effects of the HVTL Project in the Final Environmental Impact Statement (FEIS), issued on April 12, 2021.

On May 5, 2023, Plum Creek submitted an extension request to allow construction of the Plum Creek Project to commence within four years of the 2021 Site Permit issuance date and extend the in-service date of the Plum Creek Project to December 31, 2026. The Commission approved Plum Creek's request on July 5, 2023, allowing construction to commence on or before September 23, 2025 (2023 Site Permit) and extending the in-service date, as requested. The amended Site Permit is herein referred to as the 2023 Site Permit.

In addition to the HVTL Project changes requested herein, Plum Creek is submitting a request to amend the 2023 Site Permit to update the turbine models for the Wind Project and to revise the location of Collector Substation 1 to a new location in Township 108N, Range 38W, Section 5 in Ann Township, Cottonwood County (herein referred to as Revised Collector Substation 1). The Wind Project request is presented in Plum Creek's Site Permit Amendment Request (SPAR) which is being filed under Docket No. IP-6997/WS-18-700 concurrently with this RPAR. The Preferred

Route Segment described throughout this RPAR would connect Wind Project Collector Substation 2 to Revised Collector Substation 1 via a shorter, more direct path.

In an effort to reduce increased procurement and construction costs, Plum Creek considered ways that the HVTL Project transmission line could be adjusted to shorten the route and reduce costs and the amount of land that would be needed to construct the transmission line. Through engineering and land acquisition efforts, the Preferred Route Segment was identified to provide the most benefits to the HVTL Project while minimizing or reducing the overall impacts of the HVTL Project. The Preferred Route Segment shortens the overall length of the transmission line by approximately 3.4 miles and reduces the number of turns in its alignment, which would reduce procurement and construction costs. The anticipated impacts of the Preferred Route Segment on human settlement and natural resources are similar to those of the Permitted Route Segment; though the reduced length of the transmission line segment does reduce the amount of land that would be needed for the HVTL Project. Detailed descriptions of the requested HVTL Project changes, including supplemental environmental review of those changes (refer to Section 4.0 for details), are provided throughout this RPAR. An overview of the HVTL Project that includes the requested route changes is provided in Figure 1.0-1, Map 1, and the detailed route maps in Appendix C.


Redwood County
Murray County
Cottonwood County
Walnut Grove
US Hwy 14
Eagle Ave
Hwy 10
North Hero Township
Co Rd 10
Fairview Ave
Co Rd 78
110th St
Co Rd 5
Derby Ave
Duncan Ave
Co Rd 80
Plum Creek
Springdale Township
Co Hwy 10
Revised Collector Substation 1
Co Hwy 5
241st St
Redwood County
Murray County
Co Hwy 20
Co Rd 45
100th St
200th St
Redwood County
Cottonwood County
Co Rd 77
Co Hwy 7
310th Ave
231st St
Murray County
Cottonwood County
210th St
Co Rd 55
330th Ave
Co Hwy 45
221st St
Co Rd 7
220th St
Permitted Collector Substation 1
290th Ave
Ann Township
300th Ave
Holly Township
350th Ave
Co Rd 6
211th St
Co Rd 11
201st St
Collector Substation 2
Marshall
14
PLUM CREEK WIND FARM
0 2,000 4,000 Feet
Data Source: National Grid Renewables, US Census, USGS, MDNR
Figure 1.0-1
Route Permit Amendment Request Overview
Plum Creek HVTL Project
Redwood and Cottonwood Counties, MN
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Preferred Route Segment
Permitted Route Segment
Route Width
Collector Substation
Permitted Collector Substation 1
Railroad
NHD Named Stream
City/Township
County Boundary
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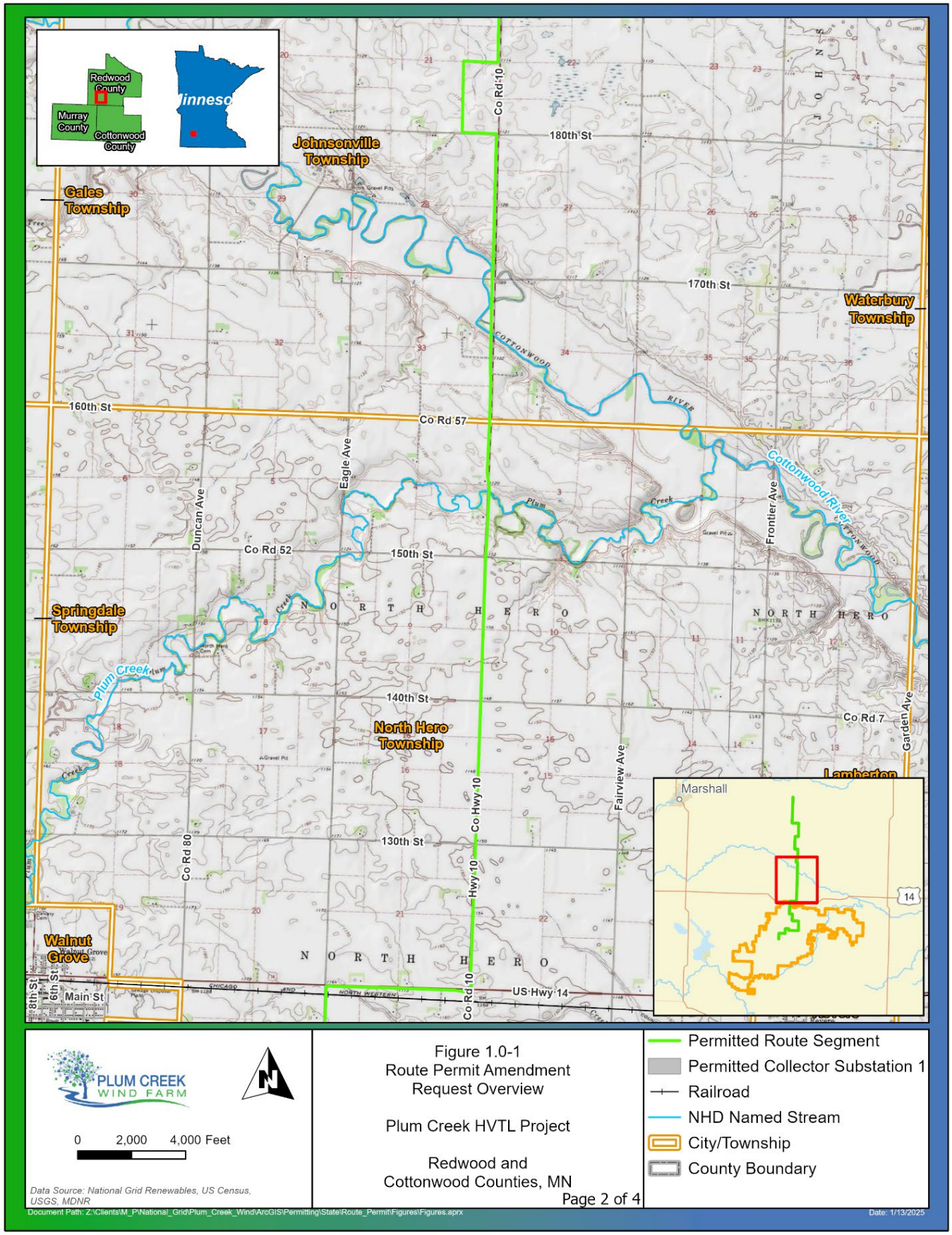
Date: 1/13/2025


Redwood County
Murray County
Cottonwood County
Minneso
Johnsonville Township
Gales Township
Waterbury Township
Springdale Township
North Hero Township
Walnut Grove
Lamberton
Marshall
14
180th St
170th St
160th St
150th St
140th St
130th St
Co Rd 10
Co Rd 57
Co Rd 52
Co Rd 7
Co Rd 80
Co Hwy 10
Hwy 10
US Hwy 14
Eagle Ave
Duncan Ave
Frontier Ave
Fairview Ave
Garden Ave
Cottonwood River
Plum Creek
Main St
8th St
6th St
PLUM CREEK WIND FARM
0 2,000 4,000 Feet
Data Source: National Grid Renewables, US Census, USGS, MDNR
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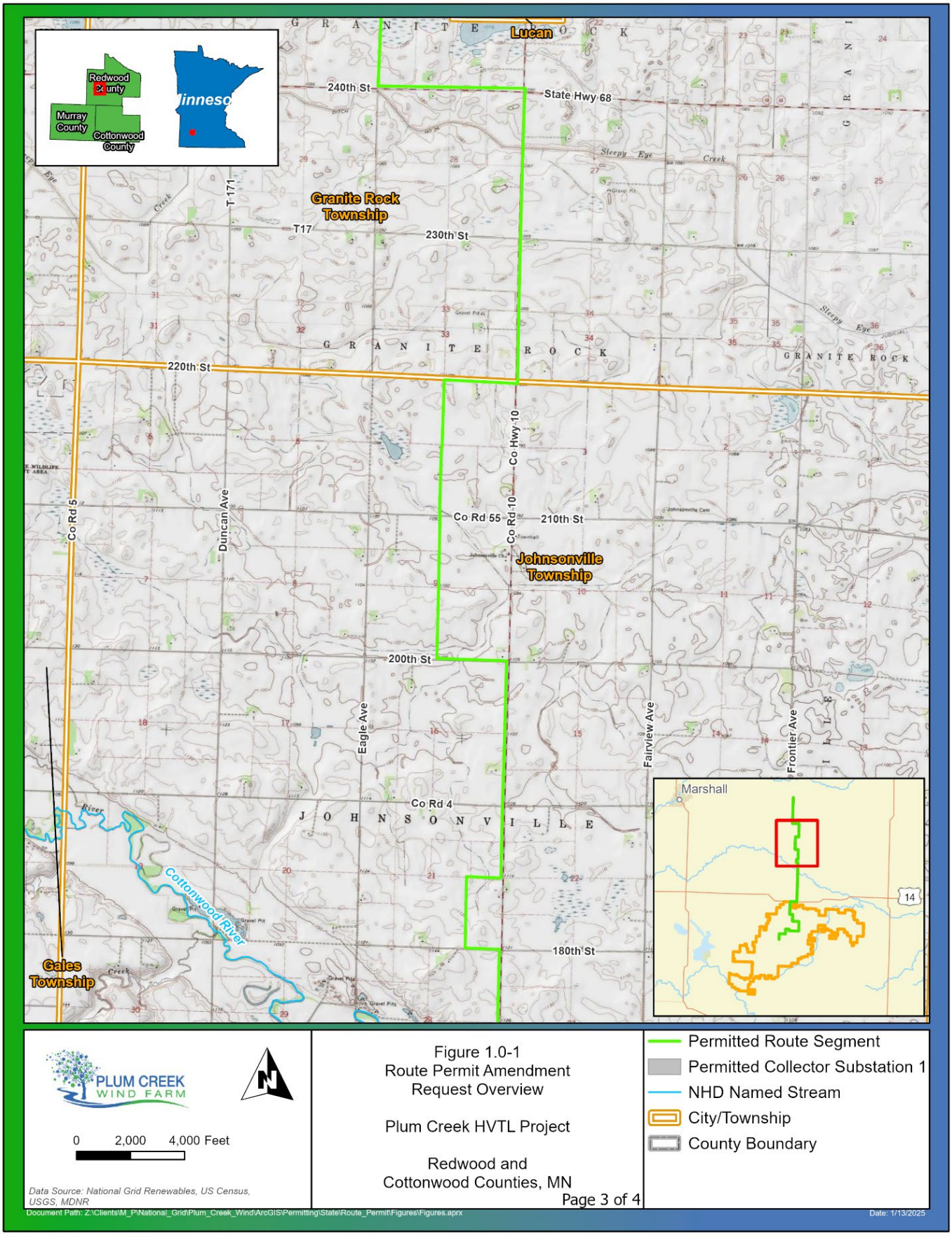
Date: 1/13/2025


Redwood County
Murray County
Cottonwood County
Lucan
240th St
State Hwy 68
Granite Rock Township
T17
T 171
230th St
220th St
Co Hwy 10
Co Rd 5
Duncan Ave
Co Rd 55
Co Rd 10
210th St
Johnsonville Township
200th St
Eagle Ave
Fairview Ave
Frontier Ave
Co Rd 4
Cottonwood River
Gales Township
180th St
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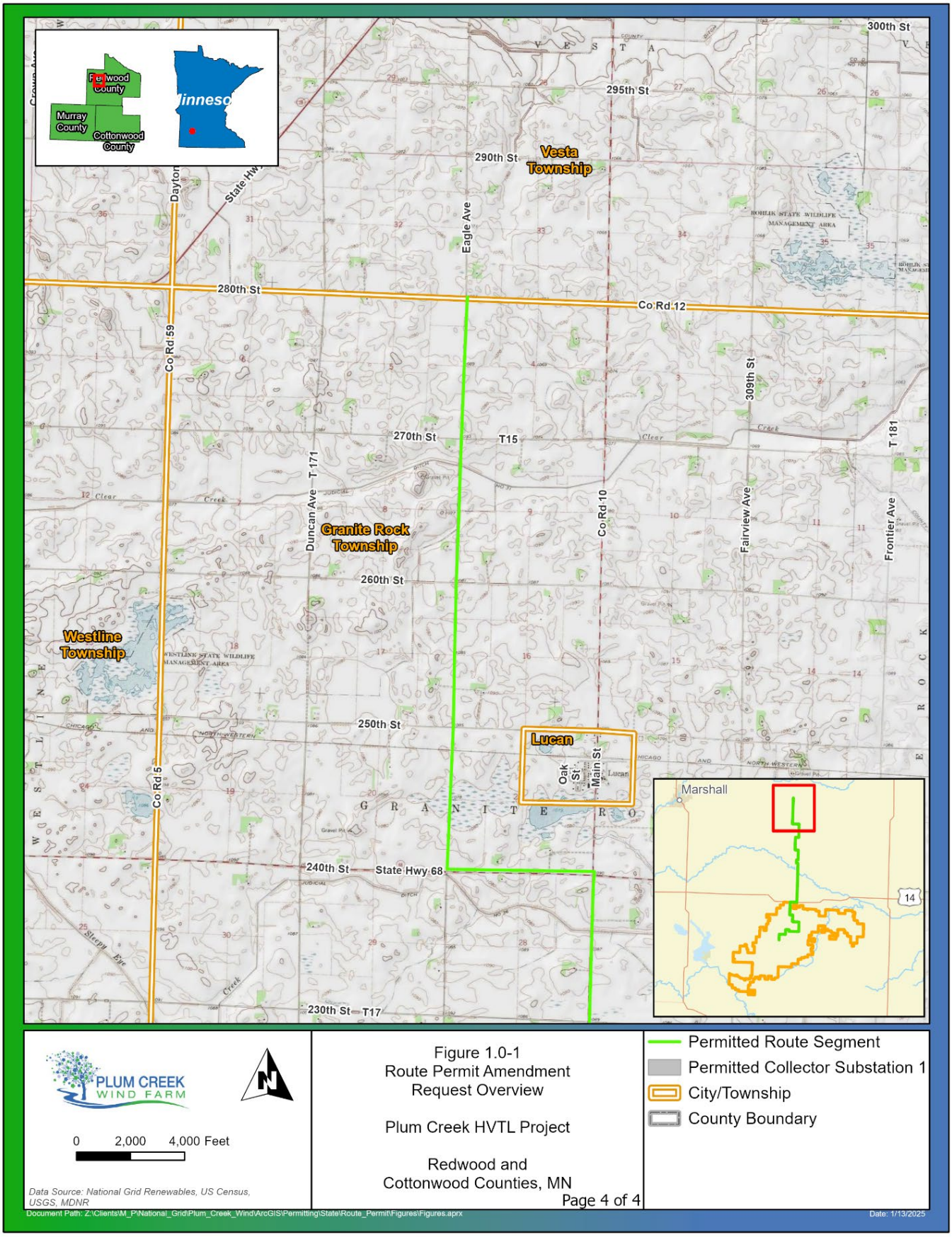
Redwood County
Murray County
Cottonwood County
300th St
295th St
290th St
Vesta Township
Eagle Ave
280th St
Co Rd 12
Co Rd 59
309th St
270th St
T15
T 171
T 181
Duncan Ave
Granite Rock Township
Co Rd 10
Fairview Ave
Frontier Ave
260th St
Westline Township
250th St
Lucan
Oak St
Main St
Co Rd 5
240th St
State Hwy 68
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Date: 1/13/2025

The Applicant is not requesting any changes to the approximately 26 miles of the HVTL Project between Revised Collector Substation 1 and the Switching Station in Redwood County or the southernmost 1.3 miles of the HVTL Project between 211th Street and Collector Substation 2. Furthermore, the Applicant is not requesting changes to the Switching Station or the POI for the Plum Creek Project. As such, these components are not discussed further in this RPAR. Furthermore, Plum Creek may also elect to construct a Battery Storage Energy System (BESS) near one of the collector substations associated with the Wind Project.[1] A BESS is required to secure a separate site permit from the Commission. If Plum Creek elects to construct a BESS, it will apply for a site permit under a separate application.

Plum Creek is actively marketing the Plum Creek Project to potential new owner(s)/power purchaser(s).[2] Through this process Plum Creek has determined that construction of the Plum Creek Project is unlikely to commence until the summer of 2026 at the earliest, or possibly as late as the summer of 2027, due to the timing of the regulatory approvals required for the consummation of the sale of the Plum Creek Project or its energy, along with delays to the current Midcontinent Independent System Operator cycle.[3] Moreover, the wind turbine models approved in the 2021 Site Permit and the 2023 Site Permit will not be commercially available in the U.S. market that would allow construction of the Plum Creek Project.[4]

1 See Docket No. E-002/CN-23-212, in which Plum Creek proposed the sale of energy generated by the Project to Northern States Power Company, d/b/a Xcel Energy. Plum Creek 's proposal also included a BESS system.

2 See For Example, eDocket Docket No. E-002/CN-23-212, which is considering Plum Creek as one of the projects to be acquired by Northern States Power Company, d/b/a Xcel Energy.

3 In Docket No. E-002/CN-23-212 (the Commission is currently considering a settlement agreement between Xcel Energy, Plum Creek and other bidders to the RFP that would require negotiated Power Purchase Agreements to be filed to the Commission within four months of the Commission's approval of the settlement agreement. This schedule would suggest a PPA between Xcel Energy and Plum Creek for the Plum Creek Project may not be approved until the summer of 2025, which would not allow construction to commence in 2025.

4 Plum Creek's proposal to sell the power from the Plum Creek Project to Xcel Energy includes an up to 230 MW nameplate capacity Wind Project and a 150 MW/600 MWh battery energy storage project. See for example, eDocket Docket No. E-002/CN-23-212. If the Plum Creek Project is selected by Xcel Energy, Plum Creek would construct 230 MWs of the overall 414 MW Wind Project and reserves the right to request the Commission approve a bifurcation of the Site Permit to allow construction of the remaining portion of the permitted Wind Project. Plum Creek will submit a separate Site Permit Application for the battery energy storage project.

2.0 APPLICABLE LAW AND ANALYSIS

2.1 Certificate of Need Process

Minnesota Statute section (Minn. Stat. §216B.243) states that a Certificate of Need is required for a "large energy facility," defined in Minn. Stat. § 216B.2421 as "any electric power generating plant or combination of plants at a single site with a combined capacity of 50,000 kilowatts or more and transmission lines directly associated with the plant that are necessary to interconnect the plant to the transmission system;" and "any high-voltage transmission line with a capacity of 200 kilovolts or more and greater than 1,500 feet in length."[5] Plum Creek filed an application for a Certificate of Need to construct the Wind Project and the HVTL Project on November 8, 2019. The application is available in Docket No. IP6997/CN-18-699. However, the HVTL Project is now exempt from Certificate of Need requirements because it is an HVTL that is required to directly interconnect a large wind energy conversion system, as defined in section 216F.01, subdivision 2, being developed and permitted by an independent power producer, Plum Creek, under chapter 216E.[7] Accordingly, an extension of the in-service date for the HVTL Project in the Certificate of Need is no longer necessary.[6] However, because the HVTL Project received its Certificate of Need prior to the independent power producer exemption becoming law and to avoid potential concerns raised by a non-independent power producer owner or offtaker of the HVTL and Wind Project, Plum Creek also requests an extension of the in-service date under the Certificate of Need to December 31, 2028.

Pursuant to Minn R. 7849.0400 Subp. 2 (H), if an applicant determines that a change in size, type, timing, or ownership, other than those specified in that subpart, is necessary for a large generation or transmission facility previously certified by the Commission, the applicant must inform the Commission of the desired change and detail the reasons for the change. The proposed reduction in the route as outlined in this application is not specified by Minnesota Rules. As stated above, the HVTL Project is now exempt from Certificate of Need requirements and is not required to inform the Commission of the desired change. Nonetheless, Plum Creek will notify the Commission of the proposed change in Docket No. IP6997/CN-18-699 and will request the Commission determine the change is acceptable without recertification.

2.2 Route Permit

Plum Creek submitted a Route Permit Application for the HVTL Project on November 8, 2019, under Docket No. IP6997 / TL-18-701[7] (November 2019 Application). During the original proceeding, additional routes were considered and designated as alternatives. The Preferred Route Segment was not considered as an alternative in that original proceeding. A Route Permit was issued by the Commission on September 23, 2021.

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5 Minn. Stat. § 216B.2421, subds. 2(1), and 2(2).

6 https://www.revisor.mn.gov/statutes/cite/216b.243

7 Initial Filing – Route Permit Application (November 8, 2019). E-docket No. 201911-157483-05. Available online at: https://www.edockets.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={5037656E-0000-CA6F-B15A-F17D92EB067A}&documentTitle=201911-157483-05.

Minnesota Rule 7850.4900 sets forth the process under which the Commission may amend the conditions to a route permit. See also Section 10 of the 2021 Route Permit. The person requesting a permit amendment must submit an application to the Commission describing the amendment and the reasons for the request. The Commission shall mail notice of receipt of the application to those persons on the general list and to those persons on the project list if such a list exists. The Commission shall provide at least a ten-day period for interested persons to submit comments on the application or to request that the matter be brought to the Commission for consideration. Plum Creek's route permit amendment request is outlined in this RPAR.

2.3 Route Permit Conditions

Plum Creek respectfully requests that the Commission amend the 2021 Route Permit to reflect the proposed HVTL Project changes described herein. A draft of the amendments to the 2021 Route Permit requested by Plum Creek with requested changes shown in redline is provided in Appendix B.

2.4 Potential Future Facilities

Plum Creek is considering the addition of a BESS project to operate behind the meter of the Plum Creek Wind Farm. Due to recent permitting reform and anticipated rulemaking, Plum Creek would permit an ancillary BESS project in a separate request/docket. More will be known about a potential BESS project in the second quarter of 2025.

3.0 HVTL PROJECT DESCRIPTION

3.1 HVTL Project and Proposed Changes

Plum Creek is developing an up to 414 MW Wind Project in Cottonwood, Murray, and Redwood Counties, Minnesota. To interconnect the Wind Project to the existing electric transmission grid, Plum Creek is proposing to build the HVTL Project in Redwood and Cottonwood County, Minnesota.

The HVTL Project that was evaluated in the FEIS and approved in the 2021 Route Permit begins near the center of the Wind Project at Collector Substation 2 in Ann Township in northwestern Cottonwood County. The HVTL Project then travels generally north and east for about five miles toward Wind Project Collector Substation 1, also in Ann Township. From Collector Substation 1, the HVTL Project travels north and west for a little over two miles before beginning to travel north for about 24 miles toward the Switching Station and the Plum Creek Project's POI with the existing Brookings-to-Hampton 345 kV transmission line in Redwood County, Minnesota.

With this RPAR, Plum Creek is requesting Commission approval to change the southernmost 7.5-mile segment of the HVTL Project (the Permitted Route Segment) to a shorter, more efficient route that will connect Collector Substation 2 to the new location of Revised Collector Substation 1 (the Preferred Route Segment). A detailed description of Revised Collector Substation 1 is presented in Plum Creek's SPAR, as noted in Section 1.0. The proposed substation changes are not discussed further in this RPAR, but the location of the new Revised Collector Substation 1 is used to describe the northern endpoint of the Preferred and Permitted Route Segments.

To assist the Commission with evaluating Plum Creek's requested changes, Plum Creek is presenting a supplemental environmental review of the Preferred Route Segment compared to the Permitted Route Segment in Section 4.0. Figure 1.0-1 in Section 1.0 provides an overview of the Preferred Route Segment and the corresponding segment of the Permitted Route (i.e., the Permitted Route Segment). As presented in this RPAR, the requested changes will reduce the environmental impacts from the HVTL Project.

The Permitted Route Segment begins about one mile northeast of Collector Substation 2 and about 0.5 mile east of the intersection of 310th Avenue and 211th Street, then travels east following 211th Street for about one mile. At County State-Aid Highway (CSAH) 7, the Permitted Route Segment turns north for a little under one mile, before turning east and generally following property lines for about two miles toward 340th Avenue. At 340th Avenue, the Permitted Route Segment turns north for about 0.5 mile and connects to Collector Substation 1. The Permitted Route Segment exits Collector Substation 1 and travels generally north and west for about 2.5 miles toward the location of the new Revised Collector Substation 1 in Township 108N, Range 38W, Section 5, Ann Township, Cottonwood County, just south of the Cottonwood County border.

The Preferred Route Segment also begins about one mile northeast of Collector Substation 2 and about 0.5 mile east of the intersection of 310th Avenue and 211th Street. Instead of traveling east, the Preferred Route Segment turns north and continues for about 2.5 miles, crossing 220th Street and 210th Street. About 0.5 mile north of 210th Street, the Preferred Route Segment turns to the east, crosses over CSAH 7, parallels the county road for another 0.5 mile, then turns east again and

travels along the southern side of CSAH 45 before connecting to the new proposed Revised Collector Substation 1, in Township 108N, Range 38W, Section 5, Ann Township, Cottonwood County, just south of the Cottonwood County border.

3.2 Route Width

The Power Plant Siting Act, Minn. Stat. § 216E, directs the routing of transmission lines in a way that "minimize[s] adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring that electric energy needs are met and fulfilled in an orderly and timely fashion." The Power Plant Siting Act further authorizes the Commission to meet its routing responsibility by designating a "route" for a new transmission line when it issues a Route Permit. A "route" may have "a variable width of up to 1.25 miles," within which the right-of-way for the transmission facilities can be located.

A route should be wide enough to provide flexibility for the permittee to work with landowners to address concerns and to address engineering issues that may arise after a Route Permit is issued. Once a route is established by the Commission, the permittee then does more detailed engineering and survey work and obtains input from landowners to establish a final alignment and pole placement.

The Permitted Route Segment was permitted with a route width of 1,000 feet. Plum Creek proposes a route width of 1,000 feet for the Preferred Route Segment.

Once the permittee establishes a final alignment and structure placement, the permittee provides proposed construction drawings to the Commission in the form of a "Plan and Profile" compliance filing so the Commission can confirm that the permittee's plans are consistent with the Route Permit.

Given the Commission's practice to identify an "anticipated alignment" in its Route Permit decisions, Plum Creek has developed what it currently believes to be the likely alignment for the Preferred Route Segment that minimize the overall potential impacts based on the routing factors identified in Minn. Stat. § 216E.03, subd. 7(b), and Minn. R. Ch. 7850.4100. Where needed for the purpose of comparison, the anticipated alignment of the Permitted Route Segment that was permitted in the 2021 Site Permit and evaluated in the FEIS is used. This application provides the information necessary to compare the impacts of the anticipated alignment of the Permitted and Preferred Route Segments.

If the Commission approves this RPAR, the alignment of the Preferred Route Segment may require modifications due to limitations inherent in identifying an alignment absent detailed survey and engineering work, site review, and design. The anticipated alignment of the Preferred Route Segment was developed for purposes of evaluating the potential impacts of Plum Creek's proposed route changes and to allow comparison to a similar segment of the route approved in the 2021 Route Permit (i.e., the Permitted Route Segment). Detailed maps depicting the Preferred and Permitted Route Segments are provided in Appendix C. Plum Creek completed a preliminary design for each alignment based on the information known at the time of the filing of this RPAR.

After the Commission issues a Route Permit amendment decision with an anticipated alignment, Plum Creek will develop a final alignment by reviewing that anticipated alignment with individual landowners and agencies with permitting responsibilities and performing detailed survey and engineering work, site review, and design. The final alignment of the Preferred Route Segment will be provided to the Commission through the Plan and Profile submission and review process discussed above. As part of that submission, Plum Creek will inform the Commission of any changes in the Preferred Alignment from that presented in this RPAR and compare impacts between the permitted alignment and the final alignment developed by the permittee.

3.3 Transmission Structure and Conductor Design

Plum Creek is not proposing changes to the transmission structures or conductors that were originally proposed for the HVTL Project in the November 2019 Application and evaluated in the FEIS. The Preferred Route Segment will be constructed of custom steel single-pole (monopole) structures. Plum Creek will implement four types of monopole structures: tangent, small angle, heavy angle, and dead end. These structures are typically used in the following situations:

- Tangent – structures that support straight or nearly straight runs of conductor;
- Small Angle – structures that turn the conductor approximately 2 to 30 degrees;
- Heavy Angle – structures that turn the conductor approximately 30 to 60 degrees; and
- Dead End – structures that turn the conductor approximately 60 to 90 degrees or take the full tension of the line in one direction.

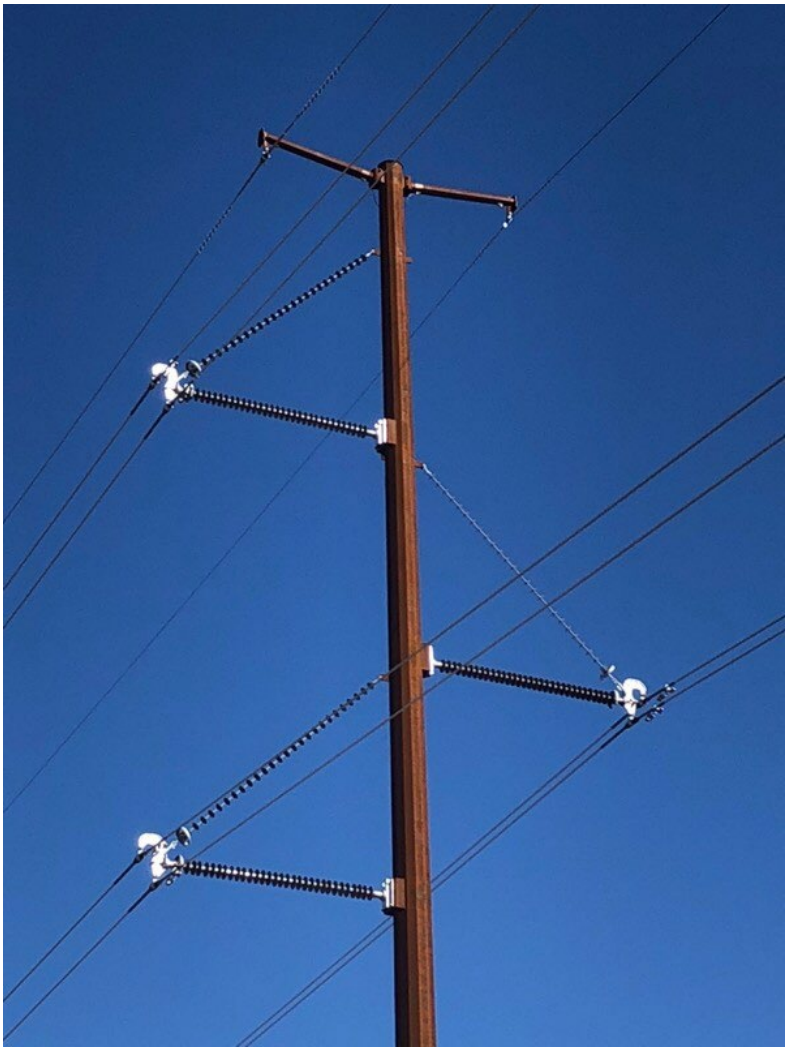
The proposed structures will range in height from approximately 110 feet to 125 feet tall. The typical spans between structures will be about 650 feet. Generally, tangent structures will be directly embedded; angled and dead-end structures will have concrete foundations between 18 and 45 feet deep, depending on soil conditions, geotechnical analysis, and the structures' function (i.e., heavy-angle and dead-end structures typically require deeper foundations). Table 3.3-1 summarizes the four typical monopole structure designs for the line. Specialty structures, such as H-frame structures, may be required in certain situations such as longer spans to avoid environmentally sensitive resources including wetlands complexes.

Table 3.3-1
Typical Structure Design Summary

Structure Type	Structure Material	Typical Right-of-way Width (feet)	Structure Height (feet)	Structure Base Diameter (inches)	Foundation Diameter (feet)	Average Span Between Structures (feet)
Tangent	Steel	150	125	80	N/A	650
Small Angle	Steel	150	120	80	8	650
Heavy Angle	Steel	150	115	80	9	650
Dead End	Steel	150	110	80	9	650

Figure 3.3-1 provides photos of typical single-circuit monopole structures that Plum Creek proposes to use for the HVTL Project and the Preferred Route Segment. All four proposed structure types are monopole structures that differ in the conductor angles.

Figure 3.3-1 Photo of Typical Single-Circuit Monopole 345 kV Structure



The conductors for the 345 kV transmission line will consist of either 2-bundled "Cardinal" (954 thousand circular mils) or 2-bundled "Bittern" (1,272 thousand circular mils) Aluminum Conductor Steel Reinforced cables, or cables with comparable capacity. The 345 kV conductors will have a capacity equal or greater to 1,992 amperes.

The proposed transmission line will be designed to meet or surpass relevant local and state codes including the National Electric Safety Code standards. Applicable standards will be met for construction and installation, and applicable safety procedures will be followed during design, construction, and after installation.

3.4 Transmission Line Right-of-Way

Plum Creek is proposing a 150-foot right-of-way for the anticipated alignment of the Preferred Route Segment; this is the same right-of-way width that was described in the November 2019 Application and evaluated in the FEIS. When paralleling existing road rights-of-way, Plum Creek proposes to place poles on adjacent private property, within approximately 10 feet of the existing road right-of-way. These pole placements allow the transmission line right-of-way to share existing road rights-of-way to the greatest extent feasible and will reduce the overall size of the easement required from the private landowner along roads. Pole placement and offset distances may vary in areas such as highway interchanges due to county design requirements and in areas of planned future road expansion.

3.5 HVTL Project Schedule

An anticipated permitting and construction schedule for the HVTL Project is provided in Table 3.5-1. This schedule is based on information known as of the date of filing and may be subject to change as further information develops or if there are delays in obtaining the necessary federal, state, or local approvals that are required prior to construction.

Table 3.5-1
Anticipated HVTL Project Schedule

Activity	Estimated Activity Dates
Minnesota Certificate of Need and RP Amendment Issued	Q3 2025
Survey and Transmission Line Design Begins	Q3 2025
Other Federal, State, and Local Permits Issued	Q2 2026
Start Right-of-Way Clearing	Q3 2025
Start HVTL Project Construction	Q2 2026
HVTL Project In-Service	Q4 2027

3.6 HVTL Project Costs

For purposes of this RPAR, Plum Creek developed design-specific route and structure cost estimates for the Preferred and Permitted Route Segments.

Table 3.6-1 provides total HVTL Project costs for each of Plum Creek's proposed segment and design alternatives. These costs include all transmission line costs (including materials, associated construction, permitting and design costs, and risk assessment contingencies), and right-of-way costs. The costs in Table 3.6-1 include both 2019 dollar costs and costs escalated to the year a particular cost is anticipated to be incurred. Refer to Chapter 2 of the Certificate of Need application (Docket No. IP6997/CN-18-699) for more detailed information on Plum Creek's cost analysis. Plum Creek has used the same assumptions in preparing the cost estimates for the Preferred Route Segment.

Table 3.6-1 Estimated HVTL Project Costs		
Costs	**Permitted Route Segment**	**Preferred Route Segment**
2024$	$62M	$54M
$ Escalated to Anticipated Year of Spend	$65.1M	$56.7M

3.7 Design Options to Accommodate Future Expansion

The HVTL Project transmission line as proposed would have capacity to carry up to 1,000 MW of electricity. The Wind Project is proposed to generate up to 414 MW and the outlet provided by the HVTL Project could allow for future additional generation to be carried by the transmission line. This allowance appropriately capitalizes on the construction of the HVTL Project and minimizes environmental impacts. Additionally, the HVTL Project would be added to the local and regional transmission network, potentially providing a more robust outlet to a broader geographic area.

3.8 Right-of-Way Acquisition

Plum Creek provided a detailed discussion of right-of-way acquisition, construction, restoration, and maintenance procedures for the HVTL Project in its November 2019 Application. No changes to these procedures are proposed as part of this RPAR. The Preferred Route Segment right-of-way is made up of fourteen landowner groups. The proposed alignment will require full transmission easements from seven landowner groups and overhang easements from the other seven landowner groups. Six of the landowner groups have signed full transmission easement agreements. The remaining landowner group is in final negotiations for a full transmission easement agreement. Five groups have signed overhang easement agreements. Two landowner groups are in negotiations for overhang easements. Pursuant to Minn. R. Ch. 7850.1900, Subp. 2(G), a list of landowners whose property is within the proposed Preferred Route Segment is provided in Appendix D.

4.0 SUPPLEMENTAL ENVIRONMENTAL REVIEW

Plum Creek is providing a supplemental environmental review of anticipated impacts and proposed mitigation measures for the changes requested in this RPAR (where applicable) to allow the Commission to consider the potential impacts and evaluate conditions of the request. Plum Creek revisited all data sources that were reviewed to prepare the November 2019 Application and provided to EERA for evaluation in the FEIS to evaluate and compare the Permitted and Preferred Route Segments. In addition, Plum Creek is providing an analysis of topics that were not addressed in the FEIS but have typically been considered in more recent proceedings before the Commission, including environmental justice, air quality, climate change, and greenhouse gas emissions.

This section provides a general description of the environmental and human setting of the Permitted and Preferred Route Segments and compares the impacts of the two route segments to provide a sense of how HVTL Project impacts would differ if the Commission approved Plum Creek's request.

This section does not present a reevaluation of the full HVTL Project, as no changes are proposed to the approximately 26 miles of the HVTL Project between Revised Collector Substation 1 and the Switching Station in Redwood County, the southernmost 1.3 miles of the HVTL Project between 211th Street and Collector Substation 2, or the associated Switching Station and POI.

Plum Creek analyzed potential impacts on human and environmental resources for the Permitted and Preferred Route Segments using the same regions of influence used in the FEIS. The region of influence for each resource is the geographic area within which the Permitted and Preferred Route Segments may exert some influence. These regions of influence vary with the resource being analyzed and the potential impact and are summarized in Table 4.0-1.

The following regions of influence will be used:

- **Right-of-Way** is the area required for safe operation of the transmission line. The right-of-way must be within the designated route and is the area for which the permittee obtains rights from landowners to construct and operate the line. Plum Creek proposes a 150-foot right-of-way – 75 feet on each side of the transmission line.
- **Route Width** refers to the width (area) permitted by the Commission where the transmission line could be located. For the purposes of analysis, this document uses a 1,000-foot route width (500 feet either side of the anticipated alignment). As discussed in Section 3.2, Plum Creek has requested a route width of 1,000 feet for the Preferred Route Segment.
- **One thousand feet**. A distance of 1,000 feet from the anticipated alignment of the line will be used as the region of influence for analyzing potential aesthetic and property value impacts and impacts to electronic devices.
- **Anticipated Alignment** is the anticipated location of the structures and line within the right-of-way and route width. Can be considered – but not described as – the centerline of the HVTL Project.

- **One mile**. A distance of one mile from all routing options will be used as the region of influence for analyzing potential impacts to public utilities, tourism and recreation, roads, archaeological and historic resources, and rare and unique species.
- **Project Area** is used to refer to the counties through which the HVTL Project passes and will be used as the region of influence for analyzing potential impacts to socioeconomics, cultural values, zoning and land use compatibility, airports, emergency services, air quality. The Project Area is shown in Map 2.

Table 4.0-1
Regions of Influence

Resource Type	Element	Region of Influence
Human Settlement	Displacement, Noise	Right-of-Way
	Aesthetics, Property Values, Electronic Interference	1,000 Feet
	Public Utilities, roads	One Mile
	Socioeconomics, Cultural Values, Zoning and Land Use Compatibility, Airports, Emergency Services,	Project Area
Public Health and Safety	Electric and Magnetic Fields, Implantable Medical Devices, Stray Voltage, Induced Voltage	Route Width
	Air Quality	Project Area
Land-Based Economies	Agriculture, Forestry, Mining	Right-of-Way
	Tourism and Recreation	One Mile
Archeological and Historic Resources	Archeological and Historic Resources	One Mile
Natural Environment	Water Resources, Wetlands, Vegetation, Wildlife (except birds) Wildlife Habitat	Right-of-Way
	Wildlife (birds)	Route Width
	Rare and Unique Resources	One Mile

4.1 Description of Environmental Setting

The Minnesota Department of Natural Resources (MDNR) and the U.S. Forest Service have developed an Ecological Classification System for ecological mapping and landscape classification in Minnesota that is used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features (MDNR, 2024a). Through the Ecological Classification System, the State of Minnesota is split into ecological provinces, sections, and subsections. The HVTL Project is located entirely within the Prairie Parkland Province and the North Central Glaciated Plains section (251B). The Permitted Route Segment and Preferred Route Segment are both within the Coteau Moraines ecological subsection (241Bb) of the Prairie Parkland Province.

The Coteau Moraines ecological subsection is characterized as a transition from shallow deposits of windblown silt (loess) over glacial till to deeper deposits of loess. A steep escarpment marks the northeast edge of the subsection. The depth to bedrock in this subsection is 600 to 800 feet through most of this area. Soils are loamy and well-drained with thick dark surface horizons. Annual precipitation in the Coteau Moraines subsection ranges from 24 inches in the west to 27

inches in the east and averages 145 to 150 days in length. Prior to Euro-American settlement, vegetation in this subsection was almost entirely tallgrass prairie. Wet prairies were restricted to narrow stream margins and forests were similarly restricted to ravines along a few streams, such as the Redwood River. Land in this subsection is currently used for agricultural activity and there are few remnants of prairie vegetation that exist today.

The area crossed by the Preferred Route Segment is between 1,222 and 1,364 feet above mean sea level, with elevation gradually decreasing from south to north; elevations along the Permitted Route Segment are the same.

4.2 Human Settlement

The Project Area is rural with farmsteads located along roads, and away from population centers. The nearest municipalities to both the Preferred Route Segment and the Permitted Route Segment are Walnut Grove (2.0 miles northwest) and Revere (3.1 miles northeast).

According to the 2022 American Community Survey 5-year Estimates Demographic and Housing Estimates, the population of Walnut Grove is 734 persons; the population of Revere is 64 persons (U.S. Census Bureau, 2022a).

4.2.1 Emergency Services and Public Health and Safety

Emergency services and communication networks have not changed from the information that was provided in the November 2019 Application and evaluated in the FEIS. There are no Allied Radio Matrix for Emergency Response towers within one mile of the anticipated alignment of the Preferred Route Segment (Minnesota Department of Public Safety, 2018).

No changes to the HVTL Project's potential to interfere with local emergency services or public health and safety are anticipated from the proposed changes described herein. Plum Creek remains committed to the mitigation measures proposed in the November 2019 Application and will comply with the conditions in the 2021 Route Permit, including:

- 2021 Route Permit Condition 5.3.3: Any temporary road closures required during construction will be coordinated with local jurisdictions to provide safe access of police, fire, and other rescue vehicles.
- Local law enforcement resources may be utilized for traffic control and law enforcement during construction activities.
- In the event that emergency services are needed for local residents during the approximately 12 to 15 months of construction, construction will stop, and any impeding equipment will be relocated so that emergency vehicles may access the emergency site.
- Any accidents that might occur during construction of the HVTL Project would be handled through local emergency services.
- The influx of approximately 30 workers to construct the HVTL Project would not be expected to influence emergency or public health services.
- Once construction is complete, the HVTL Project will not impede emergency services.

- 2021 Route Permit Condition 5.5.1: The HVTL Project will meet local, state, and National Electric Safety Code safety standards. The proposed transmission line will be equipped with protective devices to prevent damage from transmission line or pole falls or other potential accidents.
- The HVTL Project will be equipped with protective devices (circuit breakers and relays located in substations where transmission line terminates) to safeguard the public in the event of an accident, or if a structure or conductor falls to the ground. The protective equipment will de-energize the transmission line should such an event occur.
- In addition, substation facilities will be fenced and accessible only by authorized personnel.
- Signage around the HVTL Project will warn the public of the safety risks associated with the energized equipment.
- Construction crews will comply with Occupational Safety and Health Administration measures to ensure their own safety.

4.2.2 Electric and Magnetic Fields

No changes to the HVTL Project's potential for electric and magnetic fields to cause stray voltage, or interfere with farming operations, vehicle use, and metal buildings near power lines are anticipated from the proposed changes described herein. Incorporating the Preferred Route Segment into the HVTL Project would not change the calculated electric or magnetic fields that were described in the November 2019 Application or in the Electric and Magnetic Fields Report provided in Appendix G of the November 2019 Application. There are two residences within the route width of the Preferred Route Segment as compared to five residences within the route width of the Permitted Route Segment. The nearest residence to the anticipated alignment of the Preferred Route Segment is about 250 feet (refer to the detailed route maps in Appendix C). The nearest residence to the anticipated alignment of the Permitted Route Segment is 184 feet.

Plum Creek remains committed to the mitigation measures proposed in the November 2019 Application and will comply with the conditions in the 2021 Route Permit, including:

- 2021 Route Permit Condition 5.4.1: The Permittee shall design, construct, and operate the transmission line in a manner so that the maximum induced steady-state short-circuit current shall be limited to five milliamperes root mean square (rms) alternating current between the ground and any non-stationary object within the right-of-way.
- 2021 Route Permit Condition 5.4.1: Appropriate measures, such as proper grounding, will be taken to prevent stray voltage problems. Plum Creek would be required to remedy any stray voltage issues caused by the HVTL Project as a condition of the Route Permit amendment.
- 2021 Route Permit Condition 5.4.2: The transmission line shall be designed, constructed, and operated in such a manner that the electric field measured one meter above ground level immediately below the transmission line shall not exceed 8.0 kV per meter root mean square.

- The gen-tie line will be designed to meet or exceed minimum clearance requirements with respect to electric fencing as specified by the National Electric Safety Code.
- The gen-tie line will be designed to meet or exceed minimum clearance requirements with respect to roads, driveways, cultivated fields, and grazing lands as specified by the National Electric Safety Code; recommended clearances within the National Electric Safety Code are designed to accommodate a relative vehicle height of 14 feet.
- Plum Creek will work with landowners to ground fences, gates, buildings, or other structures that may be subject to induced current from the line and educate landowners on these concerns and protective measures. Should landowners identify safety concerns, Plum Creek will investigate and take corrective action.

4.2.3 Displacement

The Preferred Route Segment crosses sparsely populated rural areas that are used for agricultural production. Plum Creek designed the Preferred Route Segment to follow property lines and other linear infrastructure and to limit proximity to residences and other buildings to the extent practicable. As noted in Section 4.2.2, fewer residences are located within the requested route width of the Preferred Route Segment, when compared to the Permitted Route Segment. No residences or buildings would be located within the Preferred Route Segment right-of-way.

The Preferred Route Segment will not result in displacement because no residences or other structures are located within the Preferred Route Segment right-of-way. The nearest residence to the anticipated alignment of the Preferred Route Segment is 250 feet; this residence is located on the opposite side of CSAH 45 from the proposed alignment. In comparison, the nearest residence to the anticipated alignment of the Permitted Route Segment is about 184 feet. Residences in proximity to the anticipated alignments of the Preferred and Permitted Route Segments are shown on the detailed maps in Appendix C.

4.2.4 Noise

No changes to the HVTL Project's potential to affect existing sound levels are anticipated if the Preferred Route Segment is approved by the Commission. The Project Area is rural and ambient noise levels in rural areas are generally between 35 and 40 A-weighted decibels (dBA) during daytime hours. Noise levels do increase sporadically with passing vehicle traffic, high winds, or use of farm equipment, all-terrain vehicles, or snowmobiles. The primary noise receptors within the area surrounding the Preferred Route Segment are residences and farmsteads that are assigned to Noise Area Classification 1.

Temporary increases in noise are anticipated during the period of construction, as described in the November 2019 Application and evaluated in the FEIS. The closest residence to the Preferred Route Segment is 175 feet away from the edge of the right-of-way. Table 4.2.4-1 shows the predicted maximum construction noise levels at the closest residence.

Table 4.2.4-1 Predicted Construction Noise Levels at the Closest Receptor [1]		
Item	**Permitted Route Segment**	**Preferred Route Segment**
Distance to residence from edge of 150-foot right-of-way (feet)	109	175
Predicted construction noise level (dBA)	78.2	74.1

Construction impacts are anticipated to be short term and localized. Plum Creek remains committed to the construction noise mitigation measures proposed in the November 2019 Application and will comply with the conditions in the 2021 Route Permit, including:

- Construction activity would only be present at a particular location for a few days at a time, but on multiple occasions throughout the period between right-of-way clearing and restoration. As such, construction noise would be highly localized, temporary, and minor.
- 2021 Route Permit Condition 5.3.5: Construction will typically occur between daytime hours (i.e., 7 a.m. and 7 p.m.). Construction shall comply with noise standards established under Minn. R. Ch. 7030.0010 to 7030.0080.
- Plum Creek and its contractors will use sound-control devices as they are reasonably available on vehicles and equipment, conduct construction activities primarily during daylight hours, and will not run vehicles and equipment unnecessarily.

During operation of the HVTL Project, noise from the transmission line is anticipated to be inaudible during fair conditions. The transmission line may produce noise during rainy conditions due to the corona effect, a type of electrical conduction that occurs in the atmosphere near the conductor that may result in an audible hissing and cracking sound. It is likely, however, that most of the time when climatic conditions result in corona, the noise levels of falling rain would exceed the corona noise making the noise from the transmission line inaudible. Table 4.2.4-2 shows the predicted operating noise for the Permitted Route Segment and the Preferred Route Segment at the receptors nearest to the centerline of each segment. Accordingly, noise levels are anticipated to be lower at the closest receptor for the Preferred Route Segment than what was anticipated for the Permitted Route Segment.

Table 4.2.4-2 Predicted Operating Noise Levels at the Closest Receptor [1]		
Item	**Permitted Route Segment**	**Preferred Route Segment**
Distance to residence from anticipated alignment (feet)	184	250
Predicted operating noise level (dBA)	41.7	38.5

4.2.5 Aesthetics

No changes to the HVTL Project's potential to affect the existing aesthetics of the RPAR Project Area are anticipated if the Preferred Route Segment is approved by the Commission. Topography along the Preferred Route Segment is generally flat and the vegetation cover is uniformly low, making the topography vulnerable to visual disruptions. Viewsheds in this area are generally broad and uninterrupted, with only small, scattered areas where they are defined by trees or topography.

Similar to the Permitted Route Segment, the settlements in the vicinity of the Preferred Route Segment are residences and farm buildings (inhabited and uninhabited farmsteads) scattered along rural county roads. The area is also shaped by a built environment. Horizontal elements, such as highways and county roads, are consistent with the long and open viewsheds in the area. Vertical elements such as transmission lines and wind turbines are visible from considerable distances and are the tallest and often the most dominant visual feature on the landscape. The Plum Creek Wind Project will be at the southern end of the Preferred Route Segment.

As noted in the November 2019 Application, the HVTL Project's transmission line structures and conductors would create aesthetic impacts that are anticipated to be minimal to moderate; Incorporating the Preferred Route Segment into the HVTL Project would not exacerbate this impact. The HVTL Project as a whole will result in an alteration of the current landscape through construction of steel poles of 110 to 125 feet in height. Because the Preferred Route Segment is shorter in length than the Permitted Route Segment, and fewer residences are located along the Preferred Route Segment (refer to the detailed route maps in Appendix C), aesthetic impacts of the HVTL Project would be further minimized if the Commission approves Plum Creek's amendment request.

Table 4.2.5-1
Proximity of Residences to the Preferred and Permitted Route Segments [1]

Item	Permitted Route Segment	Preferred Route Segment
Nearest residence to Anticipated Alignment (feet)	184	250

Plum Creek remains committed to the mitigation measures proposed in the November 2019 Application and will comply with the conditions in the 2021 Route Permit, including:

- 2021 Route Permit Condition 5.3.6: Plum Creek has minimized aesthetic impacts by routing the Preferred Route Segment along property lines, field edges, and roads.
- Other minimization measures include crossing rivers and streams using the shortest distance possible (i.e., perpendicular to the waterbody) and with an existing road, avoiding placing structures directly in front of residences, and using construction methods that minimize damage to vegetation near the transmission line.

4.2.6 Socioeconomics

Demographic information provided in Plum Creek's November 2019 Application and considered in the FEIS was from the 2010 U.S. Census and the 2017: American Community Survey (ACS) 5-year Estimates Data Profiles. For this RPAR, information from the 2020 U.S. Census and the 2022 ACS 5-year Estimates was reviewed to look for changes in the demographic information that was considered in the FEIS (U.S. Census Bureau, 2022a and 2022b). Because the changes requested herein only affect Cottonwood and Redwood Counties (i.e., the RPAR Project Area), only data for these counties is provided.

Updated demographic information for the Project Area is provided in Table 4.2.6-1. Information originally presented in the November 2019 Application was used for the FEIS evaluation and is provided for the purposes of comparison.

Table 4.2.6-1
Population and Economic Characteristics

Category	Minnesota	Cottonwood County	Redwood County
November 2019 Application and FEIS			
2010 Population	5,303,925	11,687	16,059
Population Estimates 2013 - 2017	5,490,726	11,437	15,430
Percent Change 2010 - 2017	3.5	-2.1	-3.9
Per Capita Income (U.S. Dollars)	$34,712	$27,206	$27,543
Unemployment Rate (%)	4.3	5.1	3.0
Individuals Below Poverty Level (%)	10.5	15.6	11.8
Top Three Industries	E, M, R	E, M, Ag	E, M, Ag
Total Minority Population	14.7	7.8	10.9
Current Request			
2020 Census Population (April 1, 2020)[1]	5,706,494	11,517	15,425
Population Estimates July 1, 2023[1]	5,737,915	11,319	15,288
Percent Change 2020 - 2023[1]	0.5	-1.7	-0.9
Per Capita Income 2019-2023 (U.S. Dollars)[1]	$46,937	$34,105	$33,771
Unemployment Rate (%)[2]	4.0	3.9	1.7
Persons in Poverty (%)[1]	9.3	11.2	11.9
Top Three Industries[2, 3]	E, M, R	E, M, Ag	E, M, Ag
Total Minority Population[1,4]	23.1	20.5	14.7

[1] U.S. Census Bureau, 2023
[2] U.S. Census Bureau, 2022b.
[3] Industries are defined under the 2012 North American Industry Classification System and abbreviated as follows: Ag = Agriculture, Forestry, Fishing, and Hunting, and Mining; E = Educational, Health and Social Services; M = Manufacturing; R = Retail Trade.
[4] Total minority percentage equals the total population minus the population of White Alone, Not Hispanic or Latino.

Demographics in Cottonwood and Redwood Counties have changed slightly from what was provided in Plum Creek's November 2019 Application and evaluated in the FEIS. Population levels in Cottonwood and Redwood Counties declined slightly between the 2010 census and the 2020 census (refer to Table 4.2.6-1), with population levels in Redwood County showing a larger decrease than population levels in Cottonwood County.

Per capita incomes in Cottonwood and Redwood Counties have increased by more than $6,000 from what was considered in the FEIS. Unemployment rates have decreased in both counties and the percentage of persons in poverty has decreased in Cottonwood County while poverty levels in Redwood County are similar to what was presented in the November 2019 Application and evaluated in this FEIS. The top three industries in both counties have remained the same as what was considered in the FEIS.

The racial and ethnic makeup of the RPAR Project Area has changed slightly from what was presented in the November 2019 Application and evaluated in the FEIS with the percentage of minority residents in both counties showing significant increases.

4.2.6.1 Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income in decisions related to the development, implementation, and enforcement of environmental laws, regulations, and policies (Minnesota Pollution Control Agency [MPCA], 2024a). The MPCA developed the Understanding Environmental Justice in Minnesota online screening tool to assist with identifying areas of concern for environmental justice (MPCA, 2024a). The online tool uses demographic and economic data from the U.S. Census Bureau's 2018-2022 ACS 5-year estimates at the census tract level to identify environmental justice communities.

Minn. Statutes § 216B.1691, Subd. 1(e) defines an environmental justice area in Minnesota as:

> (e) "Environmental justice area" means an area in Minnesota that, based on the most recent data published by the United States Census Bureau, meets one or more of the following criteria:
>
> (1) 40 percent or more of the area's total population is nonwhite;
>
> (2) 35 percent or more of households in the area have an income that is at or below 200 percent of the federal poverty level;
>
> (3) 40 percent or more of residents over the age of five have limited English proficiency; or
>
> (4) the area is located within Indian country, as defined in United State Code, title 18, section 1151.

Both the Preferred Route Segment and the Permitted Route Segment are located in Census Tracts 2702 in Cottonwood County and Census Tract 7506 in Redwood County. Table 4.2.6-2 provides the data from the MPCA's online tool for each of the census tracts intersected by the Preferred and Permitted Route Segments. This information is also depicted in Map 3.

Table 4.2.6-2
Environmental Justice Review

County/Census Tract	Minn. Statutes § 216B.1691, Subd. 1(e) Criteria			
	Percent Non-white Population	Percent of Households with Income Equal to or Below 200 Percent of Poverty Level	Percent of Residents with Limited English Proficiency	Within Indian Country?
Cottonwood County				
Census Tract 2702	10.2%	32.7%	1.1%	No
Redwood County				
Census Tract 7506	6.4%	33.2%	1.3%	No
Source: MPCA, 2024a				

The HVTL Project is not located within Indian Country as defined in United State Code, title 18, section 1151. Furthermore, review of the MPCA's online tool indicates that there are no areas of environmental justice concern within Census Tracts 2702 and 7506 (refer to Table 4.2.6-2).

4.2.6.2 Impacts and Mitigation Measures

The changes to the HVTL Project described herein are not anticipated to affect the demographics or other socioeconomic factors in the Project Area. Updated U.S. Census Bureau information provided in Table 4.2.6-1 and described in Section 4.2.6 shows some demographic factors have changed (e.g., population levels, per capita incomes, total minority population), these changes do not represent a significant change in the socioeconomic characteristics of Cottonwood and Redwood Counties. Furthermore, as described in Section 6.4.5 of the FEIS, the HVTL Project is anticipated to provide a net financial gain for local economies in the form of money spent on housing, services and supplies during construction of the HVTL Project. Plum Creek's request to alter the southernmost portion of the transmission line would not decrease or negate the anticipated positive economic benefits of the HVTL Project. Therefore, no additional mitigation measures are proposed.

4.2.7 Cultural Values

Cultural values can be described as shared community beliefs or attitudes, among a given area or population, which provide a framework for that area's or population's commonality. As described in the November 2019 Application, the communities near the HVTL Project primarily have cultural values tied to agricultural production, light industry, and recreational activities such as hunting and fishing. In addition, the history surrounding Laura Ingalls Wilder, author of the *Little House on the Prairie* children's book series, plays an important role in the cultural values of the area.

Incorporating the Preferred Route Segment into the HVTL Project will not significantly impact the use of land for agricultural production or the general character, aesthetics, or the cultural values of the counties or townships crossed by the proposed route change. As demonstrated by other transmission line projects in the Midwest, agricultural practices continue throughout construction and operation. No impacts to light industrial uses in the RPAR Project Area are anticipated from incorporating the Preferred Route Segment into the HVTL Project. Because no impacts to cultural values are anticipated, no mitigative measures specific to cultural values are proposed.

4.2.8 Recreation

Recreation opportunities in the RPAR Project Area are similar to what was described in the November 2019 Application and evaluated in the FEIS. Publicly available geographic information system (GIS) data from U.S. Geological Survey (USGS), U.S. Fish and Wildlife Service (USFWS), and MDNR was reviewed to check for any public recreation opportunities that may be affected by the Preferred Route Segment and, for the purposes of comparison, the Permitted Route was also reviewed. No public recreation areas or snowmobile trails were identified within the 150-foot right-of-way of the Preferred Route Segment or the Permitted Route Segment (refer to Map 4). The nearest public recreation area to the Preferred and Permitted Route Segments is the

Pell Creek National Wildlife Refuge, which is about 0.5 mile west of the anticipated alignment of the Preferred Route Segment and about 1.2 miles northwest of the Permitted Route Segment.

No changes to the HVTL Project's potential effects on public enjoyment of recreation areas are anticipated from the proposed changes described herein. Plum Creek remains committed to the mitigation measures proposed in the November 2019 Application and will comply with the conditions of the 2021 Route Permit, including:

- 2021 Route Permit Conditions 5.35. and 5.3.7: use of best management practices to limit noise and fugitive dust during construction (refer to Sections 4.2.4 and 4.5.1 for details); and
- siting transmission line structures outside of the existing path of snowmobile trails.

A discussion of how the Preferred Route Segment could impact aesthetics and the measures Plum Creek would use to mitigate aesthetic impacts is provided in Section 4.2.5.

4.2.9 Land Use and Zoning

4.2.9.1 Land Use

Land use along the Preferred Route Segment is similar to what was described for the Permitted Route Segment in the November 2019 Application and evaluated in the FEIS. Land along both route segments is predominantly rural with sparsely scattered rural residences, farmsteads, commercial livestock operations, and agricultural support facilities throughout.

USGS National Land Cover Database was updated in 2021; therefore, Plum Creek reviewed the updated dataset to describe and compare land cover within the Preferred and Permitted Route Segments. Table 4.2.9-1 provides a breakdown of the land cover types within the 150-foot right-of-way of each route segment and Map 5 depicts the land cover types crossed by the Preferred and Permitted Route Segments.

Table 4.2.9-1
Land Cover Types within the 150-foot Right-of-Way of the Permitted and Preferred Route Segments

	Permitted Route Segment		Preferred Route Segment	
Land Cover/Use Category	**Acres**	**Percent**	**Acres**	**Percent**
Length (miles)	7.5		4.1	
150-foot Right-of-Way (acres)	136.5		74.3	
Land Cover				
Cultivated Crop Land	86.8	63.6%	64.5	86.8%
Hay/Pasture Land	1.8	1.3%	0.0	0.0%
Emergent Herbaceous Wetlands	1.8	1.3%	0.3	0.4%
Herbaceous Land	0.1	0.1%	0.0	0.0%
Developed Areas (i.e., low density, medium density, open space)	46.0	33.7%	9.5	12.8%
Source: Dewitz and USGS, 2021				

The primary difference between the Preferred and Permitted Route Segments is their respective lengths. Because the Preferred Route Segment is shorter than the Permitted Route Segment, fewer acres of cultivated cropland would be crossed by the 150-foot right-of-way (64.5 acres vs. 86.8 acres, respectively). The Preferred Route Segment also avoids hay/pasture and herbaceous land, and fewer acres of emergent herbaceous wetlands would be within the 150-foot right-of-way of the Preferred Route Segment. The right-of-way of the Preferred Route Segment also crosses significantly fewer acres of developed land than the Permitted Route Segment (9.5 acres vs. 46.0 acres, respectively).

4.2.9.2 Zoning

The HVTL Project is subject to Minnesota's Power Plant Siting Act (Minn. Stat. § 216E). As such, and pursuant to Minn. Stat. § 216E.10, subd. 1, a route permit issued by the Commission, "shall be the sole site or route approval required to be obtained by the utility. Such permit shall supersede and preempt all zoning, building or land use rules, regulations or ordinances promulgated by regional, county, local and special purpose government." Therefore, Plum Creek is not required to apply to county zoning authorities for additional building or land use permits or approvals for the HVTL Project. However, county zoning information provides important insight into existing human settlement patterns and future development and, for this reason, is presented herein.

Plum Creek reviewed county zoning information for Cottonwood and Redwood Counties to check for any changes since the November 2019 Application. The Redwood County Comprehensive Plan (2007) has not changed since the November 2019 Application was filed. The draft version of the Redwood County Zoning Ordinance is no longer available on the county website; however, the county website provides a link to the Land Use Ordinance but no date of adoption for this ordinance is provided. Review of the Redwood County Land Use Ordinance did not identify any changes to zoning districts or permitted uses from what was discussed in the November 2019 Application. As such, no updates are provided in this RPAR. The Cottonwood County Zoning Ordinance (2016) and Comprehensive Plan (2005) have not changed since the November 2019 Application was filed. Therefore, no updates are provided in this RPAR.

The Preferred Route Segment is within the Agricultural District in both Redwood and Cottonwood counties. The Permitted Route Segment is also within the Agricultural District in Redwood County and Cottonwood County, but there are smaller parcels zoned as Residential – Single Unit that would be crossed by the right-of-way of the Permitted Route Segment, while the Preferred Route Segment avoids residential zoning. Zoning for the Project Area is depicted on Map 6.

4.2.9.3 Impacts and Mitigation Measures

The changes to the HVTL Project described herein are not anticipated to affect the existing land uses in the RPAR Project Area. Incorporating the Preferred Route Segment would shorten the length of the HVTL Project in Cottonwood County thereby further minimizing impacts on existing land uses. As is true of the HVTL Project as a whole, existing land uses will experience minimal, short-term impacts during the period of construction. Plum Creek sited the Preferred Route Segment to parallel field edges and roads to minimize impacts to non-developed areas.

The right-of-way of the Preferred Route Segment would cross about 22 fewer acres of cultivated crop land when compared to the Permitted Route Segment. Where the Preferred Route Segment crosses cultivated crop land it does so along property lines and field edges to minimize interference with adjacent agricultural production. Furthermore, incorporating the Preferred Route Segment into the HVTL Project design would not conflict with the zoning requirements of the Agricultural District in Cottonwood and Redwood Counties.

Plum Creek remains committed to restoring construction workspaces as required in Section 5.3.16 of the 2021 Route Permit and described further in Section 4.5.6.1, and land uses (e.g., agricultural production) will be allowed to continue as before. No additional mitigation measures are proposed for the Preferred Route Segment. For a more detailed discussion of impacts and mitigation measures that will be employed in cultivated crop land, refer to Section 4.3.1.

4.2.10 Public Services

Emergency services, hospitals, school districts, water and wastewater services, utility infrastructure, and other public services in the RPAR Project Area have not changed since the HVTL Project was evaluated in the FEIS. The Preferred Route Segment is in a similar location to the Permitted Route Segment and no changes to the proposed structures or design of the HVTL Project are proposed from what was evaluated in the FEIS. As such, no additional previously undisclosed impacts are anticipated from the changes requested herein.

Plum Creek remains committed to the mitigation measures proposed in the November 2019 Application and will comply with the conditions of the 2021 Route Permit, including:

- 2021 Route Permit Condition 5.3.3: Coordinating with utility providers and authorities, including emergency services, to determine the locations of facilities, appropriate safety precautions and standards, and measures to address these precautions and standards (refer to Sections 5.3.3 and 5.3.13).
- Conducting a Gopher One Call to identify buried utilities that could be affected by construction of the HVTL Project.
- 2021 Route Permit Condition 5.3.3: If Plum Creek needs to cross an underground utility or other underground infrastructure with heavy equipment, they will employ best management practices to protect the infrastructure, such as construction matting.

4.2.11 Radio, Television, Cellular Phone, and Global Positioning System

Plum Creek conducted online research to identify radio, television, cellular phone towers, and Global Positioning Systems (GPS) receivers located within the RPAR Project Area. Radio, television, and GPS receivers in the RPAR Project Area have not changed since the HVTL Project was evaluated in the FEIS. The Preferred Route Segment is in a similar location to the Permitted Route Segment (i.e., Ann Township) and no changes to the proposed structures or design of the HVTL Project are proposed from what was evaluated in the FEIS.

Amplitude Modulation (AM) radio frequencies are most commonly affected by corona-generated noise. Interference from a spark discharge source can be found and corrected. AM radio frequency

interference typically occurs immediately under a transmission line and dissipates rapidly within the right-of-way to either side. If radio interference from transmission line corona does occur, satisfactory reception from AM radio stations previously providing good reception can be restored by appropriate modification of (or addition to) the receiving antenna system. As such, no additional previously undisclosed impacts to radio receivers are anticipated from the changes requested herein.

Television broadcast frequencies are typically high enough that they are not affected by corona-generated noise. In particular, digital and satellite television transmissions are not affected by corona-generated noise because they are dependent on packets of binary information or transmitted in the Ku band of radio frequencies (12,000-18,000 megahertz), respectively. Digital and satellite transmissions are more likely to be affected by multi-path reflections (shadowing) generated by nearby towers. In addition, line-of-sight interference from transmission line structures can affect satellite television transmissions. The use of shielded coaxial cable for cable television transmittals generally makes them insusceptible to interference from electromagnetic noise. Interference to digital and satellite signals as a result of the changes requested for the HVTL Project are not anticipated. If interference to these signals were to occur from multi-path reflections or line-of-sight interference, such interference can be mitigated by use of an outdoor antenna to improve digital signals or by moving the affected satellite antenna to a slightly different location.

No additional cellular phone services providers or GPS receivers were identified from what was presented in the November 2019 Application and evaluated in the FEIS. In addition, no cellular phone towers were identified within the Project Area. The nearest cellular phone tower is located roughly 1.5 miles northwest of the north end of the anticipated alignment of the Preferred Route Segment and roughly 0.5 mile southeast of Walnut Grove (Cell Mapper, 2024). Because both cellular phone signals and GPS operate at frequencies outside the range of electromagnetic noise generated by transmission line conductors, the risk of interference is negligible. No previously undisclosed impacts on cellular phone signals or GPS are anticipated from the changes requested herein.

The Plum Creek Project is located approximately 40 miles east of an air surveillance radar (the Tyler radar) operated jointly by the Federal Aviation Administration and the U.S. Department of Defense (DOD). Numerous existing wind projects in the area diminish the ability of the Tyler radar to effectively track low-flying aircraft, and during the Federal Aviation Administration's review of the Wind Project and coordination with the DOD, the Plum Creek Project was identified as potential contributor to further performance degradation. A mitigation agreement was entered into with the DOD in April 2023 (and was fully executed in August 2024) for the Wind Project and amended in January 2025; additional details about Plum Creek's coordination with the Federal Aviation Administration and DOD is provided in Plum Creek's Site Permit Amendment Request which is being filed under Docket No. IP-6997/WS-18-700 concurrently with this RPAR. The maximum structure height for the HVTL Project is below the threshold for Federal Aviation Administration study requirements and, accordingly, it is not necessary to include the HVTL Project in the mitigation agreement.

As required by Section 5.4.3 of the 2021 Route Permit, Plum Creek will take whatever action is necessary to restore or provide adequate reception levels near the HVTL Project. Plum Creek

remains committed to the mitigation measures proposed in the November 2019 Application will comply with the conditions of the 2021 Route Permit, including:

- 2021 Route Permit Condition 5.4.3: If radio interference from transmission line corona does occur, satisfactory reception from AM radio stations previously providing good reception can be restored by appropriate modification of (or addition to) the receiving antenna system.
- 2021 Route Permit Condition 5.4.3: If interference to digital and satellite signals as a result of the HVTL Project were to occur from multi-path reflections or line-of-sight interference, such interference can be mitigated by use of an outdoor antenna to improve digital signals or by moving the affected satellite antenna to a slightly different location.
- Addressing identified interference with communication systems, television, cellular towers, and broadband during or after construction and on a case-by-case basis.

4.2.12 Transportation

Plum Creek conducted online research to identify roadways, railroads, airports, and airstrips within the Project Area that would be crossed or paralleled by the Preferred Route Segment. The Preferred Route Segment does not cross or parallel railroads. In addition, no operating public or private airports or heliports are within the RPAR Project Area. The nearest public airport is located approximately 8.5 miles northwest of the Preferred Route Segment in Tracy, Minnesota. There are no known private landing strips in the Project Area.

The Preferred Route Segment does not cross or parallel any federal or state highways. County and township roads crossed or paralleled by the Preferred Route Segment are listed in Table 4.2.12-1; information regarding county and township roads crossed or paralleled by the Permitted Route Segment is provided for the purpose of comparison.

Table 4.2.12-1
Annual Average Daily Traffic on Roads Paralleled or Crossed by the Preferred and Permitted Route Segments

Segment	Road	County	AADT	Traffic Count Year	Distance Paralleled (miles)
Preferred Route Segment	CSAH 11	Cottonwood	40	2021	Crossed
	220th Street	Cottonwood	NA	NA	Crossed
	210th Street	Cottonwood	25	Prior to 2012	Crossed
	CSAH 7	Cottonwood	584	2023	0.7 (Also crossed)
	CSAH 45	Redwood	528	2023	0.2 (Also crossed)
Permitted Route Segment	CSAH 11	Cottonwood	40	2021	0.5 (Also crossed)
	CSAH 7	Cottonwood	584	2023	0.7 (Also crossed)
	340th Avenue	Cottonwood	NA	NA	1.5 (Also crossed)

Table 4.2.12-1
Annual Average Daily Traffic on Roads Paralleled or Crossed by the Preferred and Permitted Route Segments

Segment	Road	County	AADT	Traffic Count Year	Distance Paralleled (miles)
	County Road 55	Cottonwood	NA	NA	1.0 (Also crossed)
	330th Street	Cottonwood	NA	NA	1.0
	CSAH 45	Redwood	528	2023	0.5 (Also crossed)

Source: Minnesota Department of Transportation (MNDOT), 2024
Note: AADT = Annual Average Daily Traffic; NA = Not Available

Traffic volumes are relatively low on most roads crossed by the Preferred Route Segment, as expected given the rural nature of the area. Annual Average Daily Traffic rates are highest on CSAH 7 (584), and CSAH 45 (528). However, most roads crossed by the Preferred Route Segment either have Annual Average Daily Traffic rates of less than 50 or traffic volumes on these local roads are low enough that they are not provided in the Minnesota Department of Transportation (MNDOT) Annual Average Daily Traffic information.

4.2.12.1 Impacts and Mitigation Measures

Construction activities are not expected to permanently or significantly impact transportation in the Project Area. The Preferred Route Segment is shorter, crosses fewer roads (five), and parallels roadways for about 26 percent of its length. By comparison, the Permitted Route Segment is longer, crosses six roads, and parallels roadways for about 70 percent of its length. Neither route segment crosses or parallels railroads. In addition, no airports or airstrips are present in the RPAR Project Area.

Plum Creek remains committed to the mitigation measures proposed in the November 2019 Application and will comply with the conditions of the 2021 Route Permit, including:

- Plum Creek will limit vehicle traffic to the HVTL Project right-of-way and existing access points to the greatest extent feasible.
- Once stringing and tensioning of the transmission line is complete, the road(s) will be reopened to allow normal traffic flow.
- 2021 Route Permit Condition 5.3.13: Plum Creek will advise the appropriate governing bodies of public roads that will be used for construction and will acquire the required permits and approvals to move oversize or overweight loads.
- 2021 Route Permit Condition 5.3.13: Plum Creek will promptly repair private roads or lanes damaged when moving equipment or when accessing construction workspace, unless otherwise negotiated with the affected landowner.
- 2021 Route Permit Condition 5.3.16: After the completion of construction, Plum Creek will ensure that township, city, and county roads used for purposes of access during

construction are returned to either the condition they were in before right-of-way clearing began or better.

- Plum Creek will meet with township road supervisors, city road personnel, or county highway departments to address any issues that arise during construction with roadways to ensure the roads are adequately restored, if necessary, after construction is complete.
- Plum Creek will coordinate with the Federal Aviation Administration and MNDOT to address any concerns about the anticipated alignment of the Preferred Route Segment related aviation activities as the HVTL Project progresses and more detailed design information becomes available, including specific structure locations and heights above ground.
- Plum Creek will mail notice of the RPAR filing to aerial applicators registered with the Minnesota Agricultural Aircraft Association in the Project Area.

4.3 Land Based Economies

4.3.1 Agriculture

Information about agricultural production provided in Plum Creek's November 2019 Application, and considered in the FEIS, was from the U.S. Department of Agriculture's (USDA's) 2012 Census of Agriculture. The 2022 Census of Agriculture is now available and Plum Creek is providing updated information with this RPAR (USDA, 2022). Agricultural statistics for Cottonwood and Redwood Counties are summarized in Table 4.3.1-1. Information from the 2012 Census of Agriculture is provided for the purposes of comparison.

Table 4.3.1-1
Agricultural Statistics of Cottonwood and Redwood Counties

Agricultural Statistics	November 2019 Application & FEIS		Current Request	
	Redwood	Cottonwood	Redwood	Cottonwood
Number of Farms	1,163	813	1,323	742
Average Farm Size (acres)	448	459	423	529
Land in Farms (acres)	521,453 (93 % of county)	372,767 (92 % of county)	560,222 (99 % of county)	392,494 (95 % of county)
Market Value of Agricultural Production – Corps[1]	$365 million (70 %)	$234 million (63 %)	$463 million (58 %)	$354 million (59 %)
Top 3 Crops by Acreages	Corn, soybeans, sugar beets	Corn, soybeans, forage	Corn, soybeans, sugar beets	Corn, soybeans, forage
Market Value of Agricultural Production – Livestock[1]	$153 million (30 %)	$140 million (37 %)	$341 million (42 %)	$248 million (41 %)
Top 3 Livestock Inventories by Farms	Cattle, hogs and pigs, sheep and lambs	Cattle, hogs and pigs, sheep and lambs	Cattle, hogs and pigs, poultry	Cattle, hogs and pigs, poultry

[1] Percentages provided for market value of agricultural production of crops and livestock are calculated based on the total market value of all agricultural products combined and represent the share of total market value attributed to crops vs. livestock.

Source: USDA, 2022

Agricultural production in Redwood and Cottonwood Counties is similar today to what it was when the November 2019 Application was prepared and the HVTL Project was evaluated in the FEIS. Agricultural production remains a significant part of the local economy in Redwood and Cottonwood Counties.

The 2022 Census of Agriculture shows that the total number of farms in Redwood County has increased, while the number of farms in Cottonwood County has decreased. The average farm size has increased significantly in Cottonwood County, while the average farm size in Redwood County shows slight decreases from the 2012 data. A lower percentage of total market value of agricultural products in Redwood and Cottonwood counties is attributable to crop production when compared to the 2012 data, while the percentage attributable to livestock production has increased in both counties. The top three types of agricultural crops produced in the two counties have not changed since the 2012 data, but the top three livestock inventories by farms has shifted from cattle, hogs and pigs, and sheep and lambs in the 2012 data to cattle, hogs and pigs, and poultry in both counties.

Specialty crops typically include nurseries, vineyards, orchards, citrus groves, dairies, aquaculture, and tree farms. If present along the Preferred Route Segment, specialty crop farms (e.g., organic farms) or livestock operations may necessitate additional specific mitigation measures to minimize the effects of construction. Based on landowner outreach, no farmland along the Preferred Route Segment is engaged in specialty crop production or livestock operations. If new specialty crops or livestock operations are identified in the future, Plum Creek will work with landowners to determine measures to avoid and minimize impacts to these resources.

As shown in Table 4.5.4-1 in Section 4.5.4, about 96 percent of the soils within the 150-foot right-of-way of the Preferred Route Segment are classified as “Prime Farmland” and about 4 percent are classified as “Farmland of Statewide Importance.”

The Conservation Reserve Enhancement Program (CREP) is an offshoot of the Conservation Reserve Program, which is a land conservation program established by the USDA and administered by the Farm Service Agency that pays farmers a yearly rental fee for agreeing to take environmentally sensitive land out of agricultural production in an effort to improve environmental health and quality (USDA, n.d.). Minnesota implemented the CREP to target state-identified, high-priority conservation issues by offering payments to farmers and agricultural landowners to retire environmentally sensitive land using the Reinvest in Minnesota Reserve Program (Minnesota Board of Water and Soil Resources [BWSR], 2024). Enrollment in the Conservation Reserve Program and CREP is voluntary and participation in the program comes with certain restrictions on the types of development allowed on parcels enrolled in the program, if such development is inconsistent with the conservation goals of the program.

Although two parcels within the 1,000-foot width of the Preferred Route Segment are enrolled in the CREP, the Preferred Route Segment right-of-way avoids the identified CREP parcels. CREP easements in the RPAR Project Area are depicted on the detailed route maps in Appendix C.

4.3.1.1 Impacts and Mitigation Measures

As is true of the full HVTL Project and the Permitted Route Segment, construction of the Preferred Route Segment could cause minimal, temporary impacts to farmland from soil compaction and rutting, accelerated soil erosion, crop damage, temporary disruption to normal farming activities, and introduction of noxious weeds to the soil surface.

Table 4.3.1-2 compares the potential impacts on farmland from the Preferred Route Segment versus the Permitted Route Segment. During construction, a portion of prime farmland would be taken out of agricultural production due to the development of either route. However, the impacts will not have a significant impact on total prime farmland within the state of Minnesota or within Cottonwood and Redwood Counties. Because the Preferred Route Segment is shorter than the Permitted Route Segment, less cultivated crop land would be within the right-of-way of the Preferred Route Segment. However, because the Preferred Route Segment is generally routed along field edges and property boundaries whereas the Permitted Route Segment is routed along roadways for most of its length, the number of structures placed in cultivated crop land would be similar for both route segments.

Table 4.3.1-2
Comparison of Impacts on Agricultural Land

Resource	Permitted Route Segment	Preferred Route Segment
Farmland Area Comparison		
Segment Length (miles)	7.5	4.1
150-foot Right-of-Way (acres)	136.5	74.3
Cultivated Crop Land in 150-Foot Right-of-Way (acres)[1]	86.8	64.5
Number of Structures in Cultivated Crop Land (based on preliminary engineering design) [1]	25	24
Total Impact from Structures in Cultivated Crop Land (acres)	0.1	0.1

[1] Agricultural land includes row crops. Pasture and hay are not included as they are classified separately in Table 4.2.9-1 in Section 4.2.9.1.

The Preferred Route Segment was developed with attention to minimizing impacts on agricultural land by routing the transmission line along field edges and property lines; however, permanent impacts on agricultural land will occur where structures are placed in cultivated fields. Structures in cultivated fields act as barriers and can hinder efficient operation of large machinery. The estimated permanent impacts from each transmission structure foundation will be up to 12 feet in diameter at the surface; this would be approximately 0.1 acre total for all structures (refer to Table 4.3.1-2).

Plum Creek has designed the 150-foot right-of-way of the Preferred Route Segment to avoid CREP and Reinvest in Minnesota parcels to the extent practicable. The two identified CREP parcels within the route width of the Preferred Route Segment are not crossed by the anticipated alignment or the right-of-way. Plum Creek will work with landowners and BWSR to address any concerns they may have about potential indirect impacts to these conservation easements and would fully

compensate landowners for lost CREP revenue resulting from the placement of the line adjacent to a CREP easement.

Plum Creek remains committed to the mitigation measures required in the 2021 Route Permit and additional measures proposed in the November 2019 Application and will comply with the conditions of the 2021 Route Permit, including:

- Route Permit Conditions 5.3.7, 5.3.11, and 5.3.12: Implementing measures to reduce compaction, soil erosion, and the introduction of noxious weeds.
- Construction impacts to farmland would be short term and minimal in nature and would be mitigated through the proper use and installation of best management practices, such as minimizing the number of vehicles and protection and maintenance of topsoil during right-of-way clearing and generation-tie-line construction.
- Plum Creek will further mitigate impacts on agricultural production by coordinating with landowners or farm operators regarding the timing of construction to avoid peak growing season by constructing the HVTL Project before spring planting or after harvest in the fall. If this is not possible, Plum Creek will compensate the landowner or farm operator for crop damage, including any compaction that results from construction.
- Plum Creek proposes to minimize impacts to agricultural land by placing structures along field edges, as closely as feasible (approximately 10 feet) from the edge of road rights-of-way or parcel lines.
- Plum Creek will work with landowners to finalize the structure locations. The final spacing and location of structures will be designed to accommodate the movement of farm equipment within agricultural fields while still maintaining safety and design standards.
- Post-construction restoration efforts will include restoration of any temporary access modifications and deep plowing to remove compaction.
- Both crop and livestock activities will be able to continue around HVTL Project facilities after construction. While no impacts to agricultural land are anticipated during operation of the HVTL Project, if impacts to crops do occur during operation or maintenance of the transmission line, Plum Creek will compensate the landowner or farm operator for crop damages.
- At the time the HVTL Project was originally permitted, agricultural impact and mitigation plans were not required for HVTL projects. Plum Creek will coordinate with the Minnesota Department of Agriculture to ensure agricultural impacts are properly reduced or mitigated to the extent practicable. If necessary, Plum Creek will develop an agricultural impact and mitigation plan in coordination with the Minnesota Department of Agriculture, prior to construction.

4.3.2 Forestry

There are no forestry operations along the Preferred Route Segment; similarly, there are no forestry operations along the Permitted Route Segment. Wooded areas along the Preferred Route Segment

consist of isolated rows of trees that are used as shelter belts or wind breaks along the edges of agricultural fields or surrounding farmsteads and in riparian areas along waterbodies.

Because no forestry operations are present along the Preferred Route Segment, no mitigation measures specific to forestry operations are proposed. Plum Creek remains committed to the mitigation measures proposed in the November 2019 Application and will comply with the conditions of the 2021 Route Permit, including:

- 2021 Route Permit Condition 5.3.6 and 5.3.9: To the extent possible, Plum Creek will minimize the need for trimming and removal of trees during construction and operation of the transmission line.
- Where removal or trimming of trees is necessary, it will be performed by an arborist familiar with best practices for tree trimming to minimize stress on the tree.

4.3.3 Tourism

Tourism in the RPAR Project Area continues to center around outdoor recreational opportunities and various festivals and activities hosted by the cities within the Project Area, such as Walnut Grove. The Preferred Route Segment will be located on private lands, and outside of municipal boundaries, as was true of the HVTL Project route segments presented in the November 2019 Application and evaluated in the FEIS. No impacts on recreational areas, public lands, or other tourism-related activities are anticipated from the proposed changes described in this RPAR and no additional mitigation measures are proposed.

4.3.4 Mining

As part of this RPAR, Plum Creek reviewed updates to MNDOT's Aggregate Source Information System data (MNDOT, 2023) to check for any changes since the November 2019 Application was filed. Topographic maps and County Pit Maps for Redwood and Cottonwood counties have not been updated from what was reviewed for the November 2019 Application.

Review of current Aggregate Source Information System data did not identify mining operations within or within one mile of the Preferred Route Segment; similarly, no mining operations are within or within one mile of the Permitted Route Segment. Therefore, no impacts on mining operations and no need for new or expanded mining operations are anticipated from the changes requested herein.

4.4 Archaeological and Historic Architectural Resources

Plum Creek hired Tetra Tech, Inc. (Tetra Tech) to conduct a file search in 2019 to identify previously recorded archaeological and historic structural resources within the Wind Project boundary, the route widths presented in the November 2019 Application, and the area within a 1-mile buffer of the Plum Creek Project components; the results of this review were included in the November 2019 Application and the evaluation of Project effects in the FEIS. Because the original file search was conducted more than five years ago, Plum Creek asked Tetra Tech to refresh the review and check for any additional recorded resources that could be affected by the proposed changes described herein. Tetra Tech conducted the refreshed desktop review of the

Minnesota Statewide Historic Inventory Portal and the Minnesota Office of the State Archaeologist Portal in May 2024 to check for any additional historic structures and archaeological sites within a 1-mile buffer of the Preferred Route Segment (Holven, 2024).

No previously recorded archaeological sites were identified within one mile of the route width of the Preferred Route Segment. Two previously recorded architectural properties were identified within one mile of the Preferred Route Segment's route width. Both previously recorded architectural properties (CO-ANN-00010 and CO-ANN-00011) are bridges. Bridge No. L6565 located along Township Road 114 (i.e., 220th Street) and is about 0.3 mile east of the Preferred Route Segment right-of-way. Bridge L6616 is located along 310th Avenue and is about 0.5 mile west of the Preferred Route Segment right-of-way. Bridges No. L6565 and L6616 have not been evaluated for listing the National Register of Historic Places.

4.4.1 Impacts and Mitigation Measures

Information regarding the location of previously documented archaeological and historic Architectural Resources was taken into consideration during development of the Preferred Route Segment. The refreshed review conducted by Tetra Tech did not identify recorded archaeological sites within or within one mile of the 1,000-foot route width of the Preferred Route Segment. Two previously recorded architectural property were identified within one mile of the route width of the Preferred Route Segment, but these properties are located 0.3 to 0.5 mile from the Preferred Route Segment right-of-way and, at this distance, would not be affected by construction or operation of the Preferred Route Segment. Based on the results of the refreshed review, no direct physical impacts to recorded archaeological or architectural properties are anticipated from the Preferred Route Segment.

Plum Creek understands the area surrounding the Preferred Route Segment has potential to contain previously undocumented cultural resources. After the Commission approves this RPAR, and in consideration of the literature search results and coordination with Minnesota State Historic Preservation Office (SHPO), Plum Creek will conduct field surveys in high-potential areas that could host previously unrecorded cultural resources. The survey protocol and report will be coordinated with and approved by SHPO. If archaeological or architectural resources are identified during field surveys, Plum Creek will work with SHPO to identify measures to avoid, minimize or mitigate any effects to these resources.

If archaeological resources are discovered during construction, ground-disturbing activity will be halted in that location, SHPO will be notified, and appropriate measures will be developed in conjunction with SHPO to assess and protect the resource. Additionally, if unanticipated human remains or burial resources are discovered during construction, they will be reported to the State Archaeologist per Minn. Stat. § 307.08 and construction will cease in that area until adequate mitigation measures have been developed between Plum Creek and the State Archaeologist.

4.5 Natural Environment

4.5.1 Air Quality

Section 109(b) of the Clean Air Act requires that the U.S. Environmental Protection Agency (EPA) establish National Ambient Air Quality Standards (NAAQS) "requisite to protect" public health and welfare (Code of Federal Regulations [CFR] Title 40 Part 50). The Clean Air Act identifies two classes of NAAQS: primary standards, which are limits set to protect the public health of the most sensitive populations, such as asthmatics, children and the elderly; and secondary standards which are limits set to protect public welfare, such as protection against visibility impairment or damage to vegetation, wildlife and structures. The EPA has promulgated NAAQS for six criteria pollutants: ozone (O_3), particulate matter as particulate matter less than 10 microns in diameter (PM_{10}) or particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and lead (Pb). Cottonwood, Murray, and Redwood Counties, Minnesota are currently in compliance with the primary and secondary NAAQS for all criteria pollutants (MPCA, 2024b).

In Minnesota, air quality is tracked using air quality monitoring stations across the state. The MPCA uses data from these monitors to calculate the Air Quality Index, on an hourly basis, for O_3, $PM_{2.5}$, SO_2, NO_2, and CO. The pollutant with the highest Air Quality Index value for a particular hour sets the overall Air Quality Index for that hour. The Air Quality Index is used to categorize the air quality of a region as one of five levels of quality: good, moderate, unhealthy for sensitive groups, unhealthy, or very unhealthy (MPCA, 2024c).

The Preferred Route Segment is located nearest to the air quality monitor in Marshall, Minnesota. This station monitors O_3 and $PM_{2.5}$. The Air Quality Index for Marshall for the past five years is provided in Table 4.5.1-1 (MPCA, 2024d).

Table 4.5.1-1
Days in Each Air Quality Index Category (Marshall, Minnesota)

Year	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
2018	333	32	0	0	0
2019	326	35	0	0	0
2020	330	30	0	0	0
2021	289	65	3	2	0
2022	324	30	0	2	0

Source: MPCA, 2024d

Air quality has been considered good for the majority of the past five reported years in Marshall. Since 2018, the largest number of days classified as moderate or Unhealthy for Sensitive Groups occurred in 2021. Two days have been classified as unhealthy in each of 2021 and 2022. No days have been classified as very unhealthy.

Potential air quality impacts associated with the anticipated alignment of the Preferred Route Segment come from two primary sources: short-term emissions from construction vehicles and O_3 and nitrogen oxide (NO_X) emissions from operating the facility.

4.5.1.1 Impacts and Mitigation Measures

Construction of the Preferred Route Segment will result in temporary air emissions from construction equipment and would include carbon dioxide (CO_2), NO_X, and PM; dust generated from earth disturbing activities would also give rise to PM. During construction, the amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and road surface characteristics. Dust emissions would be greater during dry periods and in areas where fine-textured soils are subject to surface activity.

Table 4.5.1-2 shows estimated emissions of criteria pollutants from construction activity associated with the Preferred Route Segment; estimated emissions were not provided in the November 2019 Application or the FEIS evaluation, therefore comparative data is not provided for the Permitted Route Segment.

Emissions are calculated based on estimated equipment counts, hours of operation, and vehicle miles traveled. Detailed calculations are included in Appendix E. Emissions from construction would be similar to those from agricultural activities common in the RPAR Project Area and would only occur for short periods of time in localized areas. This is consistent with the evaluation provided in the FEIS for the HVTL Project (refer to FEIS Section 6.5.5).

Table 4.5.1-2
Construction Emissions of Criteria Pollutants (tons)

Description	NO_X	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$
Off-Road Engine Emissions	24.41	5.37	1.73	0.01	0.94	0.93
Unpaved Roads	--	--	--	--	2.55	0.25
Earthmoving	--	--	--	--	6.51	0.69
TOTAL	**24.41**	**5.37**	**1.73**	**0.01**	**10.00**	**1.88**

Plum Creek may employ construction-related practices to control fugitive dust such as reducing the speed of vehicular traffic on unpaved roads and covering open-bodied haul trucks. If the field representative responsible for overseeing compliance with the route permit determines that the levels of fugitive dust are problematic, Plum Creek will apply non-chlorinated water or other commercially available dust control agent on unpaved areas subject to frequent vehicle traffic.

During operation of the line, air emissions would be minimal. An insignificant amount of O_3 is created due to corona from the operation of transmission lines (Electric Power Research Institute, 1982; Whitmore and Durfee, 1973; U.S. Department of Energy, Bonneville Power Administration, 1989). A corona signifies a loss of electricity and Plum Creek has engineered the transmission line so as to limit the corona. The production rate of O_3 due to corona discharges decreases with humidity and less significantly with temperature. Rain causes an increase in O_3 production, but also accelerates the decay of O_3. O_3 production by high voltage transmission lines is not detectable above ambient conditions during fair weather. O_3 production under wet -weather conditions is detectable with special effort but is still considered insignificant.

Design of the transmission line also influences its O_3 production rate. The O_3 production rate decreases significantly as the conductor diameter increases and is greatly reduced for bundled conductors over single conductors. The production rate of O_3 increases with applied voltage. The emission of O_3 from the operation of a transmission line of the voltages proposed for the Preferred Route Segment, and HVTL Project in general, is not anticipated to have a significant impact on air quality and no mitigation is proposed.

4.5.2 Climate Change and Greenhouse Gas Emissions

4.5.2.1 Greenhouse Gas Emissions

The effects of climate change have been tied to an increase in greenhouse gas (GHG) emissions from human-related activity, including transportation, energy production, and industry (EPA, 2024a). A key element in addressing climate change is the reduction of GHG emissions produced each year. In 2007, Minnesota passed the Next Generation Energy Act, which set statutory goals to reduce GHG emissions by 80 percent between 2005 and 2050 (MPCA, 2023e), from 174.6 million tons per year of carbon dioxide equivalent (CO_2e) down to 34.9 million tons per year CO_2e (MPCA, 2023f). In December 2019, Governor Tim Walz signed into effect Executive Order 19-37 to establish a Climate Change Subcabinet and Governor's Advisory Council on Climate Change. The Climate Change Subcabinet is responsible for identifying policies and strategies to meet or exceed the statutory goals set in the NGEA and to identify policies and strategies to increase climate resiliency across the state (State of Minnesota, 2019). As of 2020, Minnesota is on track to meet this goal and has experienced a 23 percent reduction in GHG emissions across all industry sectors (MPCA, 2024f).

The Preferred Route Segment, and HVTL Project as a whole, will contribute to Minnesota's on-going success in reducing GHG emissions by connecting the Plum Creek Wind Project, a renewable source of energy, to the existing Brookings-to-Hampton 345 kV transmission line as an alternative to more carbon-intensive sources of energy, such as coal and natural gas.

Impacts and Mitigation Measures

Activities associated with the construction of the HVTL Project will result in GHG emissions from the combustion of diesel and gasoline in heavy construction equipment, delivery vehicles, and worker passenger vehicles. Emissions from construction activities were calculated by estimating the volume of fuel expected to be consumed by each piece of equipment and determining the GHG emissions released upon combustion of those fuel volumes. Table 4.5.2-1 shows the estimated GHG emissions from construction activities. Emissions are based on typical counts of diesel-fueled construction equipment, expected hours of operation, and estimated vehicle miles traveled. Upon completion of the construction activities, GHG emissions from all construction activities will cease.

Table 4.5.2-1
Preliminary Estimate: Greenhouse Gas emissions from HVTL Construction, in short tons

Description	CO_2	CH_4	N_2O	CO_2e
Off-Road Engine Emissions	1,008.62	0.04	0.01	1,011.94
Commuters and Delivery Vehicles	206.12	0.00	0.00	206.12

Table 4.5.2-1
Preliminary Estimate: Greenhouse Gas emissions from HVTL Construction, in short tons

Description	CO_2	CH_4	N_2O	CO_2e
TOTAL	**1,214.75**	**0.04**	**0.01**	**1,218.06**

Note: CO_2 – carbon dioxide
CH_4 – methane; 1 short ton CH_4 = 28 short tons CO_2e
N_2O – nitrous oxide; 1 short ton N_2O = 265 short tons CO_2e
CO_2e – carbon dioxide equivalent, calculated using the methodology and global warming potentials from EPA, 2024b.

GHG emissions from construction vehicles will be minimized by keeping construction equipment in good working order and by limiting vehicle idling to only when necessary.

4.5.2.2 Climate Resilience

MDNR publishes historical climate data from the years 1895 to 2022. This data shows that the average temperature of Cottonwood, Murry, and Redwood Counties has been increasing at a rate of 0.16 degrees Fahrenheit per decade. Over the 30-year lifespan of the HVTL Project, the annual average temperature could increase by 0.48 degrees Fahrenheit. The annual precipitation has increased at a rate of 0.31 inches per decade (MDNR, 2024b). Over the lifespan of the HVTL Project, precipitation could increase an additional 0.93 inches per year. Additionally, the frequency and intensity of heavy rainfall is increasing across the state (MDNR, 2024c).

The Preferred Route Segment, and HVTL Project as a whole, has been designed with consideration of the potential climate changes during the lifetime of the HVTL Project, including increased heavy rainfalls, stronger wind gusts, and increased temperatures. Plum Creek will design the HVTL to prevent stormwater from pooling around the base of the structures. The HVTL will be designed to meet the local and state codes and National Electric Safety Code standards applicable at the time of construction. National Electric Safety Code standards include rules to safeguard electric transmission equipment from the effects of extreme weather, including ice loading and extreme wind.

4.5.3 Geology and Groundwater Resources

Geologic and groundwater resources within the route width of the Preferred Route Segment are the same as what was described in the November 2019 Application and evaluated in the FEIS. No changes to the HVTL Project's potential to affect geologic and groundwater resources are anticipated if the Preferred Route Segment is approved by the Commission.

As noted in Section 4.1, The Coteau Moraines ecological subsection is characterized as a transition from shallow deposits of windblown silt (loess) over glacial till to deeper deposits of loess. A steep escarpment marks the northeast edge of the subsection. The depth to bedrock in this subsection is 600 to 800 feet through most of this area. Based on review of the MDNR's Karst Feature Inventory web map, no karst feature inventory points have been recorded in Cottonwood and Redwood counties (MDNR, 2025).

Plum Creek reviewed the Preferred Route Segment for EPA-designated sole source aquifers, wells listed on the Minnesota Well Index, Drinking Water Supply Management Areas and Minnesota Department of Health (MDH) Wellhead Protection Areas.

The EPA defines a sole source aquifer or principal source aquifer area as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer, where contamination of the aquifer could create a significant hazard to public health, and where there are no alternative water sources that could reasonably be expected to replace the water supplied by the aquifer (EPA, 2024c). According to the EPA Sole Source Aquifers webmap, there are currently no EPA-designated sole source aquifers crossed by the Preferred Route Segment or the Permitted Route Segment (EPA, 2024d).

The Minnesota Well Index is the most complete record of well construction and location in Minnesota and is kept up-to-date and maintained by the Minnesota Geological Survey, in cooperation with the MDH. A search of the Minnesota Well Index identified one domestic water supply well within the Preferred Route Segment; this well is not within the Preferred Route Segment right-of-way and would not be impacted if the RPAR is approved by the Commission (MDH, 2024a). The well is associated with a residence on the north side of CSAH 45; the Preferred Route Segment right-of-way would be on the south side of CSAH 45 and would not affect the residence on the north side of the road. No domestic water supply wells are within the route width of the Permitted Route Segment.

Under the Safe Drinking Water Act, each state is required to develop and implement a Wellhead Protection Program to identify the land and recharge areas contributing to public supply wells and prevent the contamination of drinking water supplies. The act was updated in 1986 with an amendment requiring the development of a broader-based Source Water Assessment Program, which includes the assessment of potential contamination to both groundwater and surface water through a watershed approach. A Wellhead Protection Area encompasses the area around a drinking water well where contaminants could enter and pollute the well.

Source water protection plans are prepared by MDH to identify and manage potential threats around drinking water sources (MDH, 2024b). Drinking water supply management areas (s) are defined protection areas for drinking water sources within Source water protection plans. Plum Creek reviewed the MDH Source Water Protection Web Map Viewer (MDH, 2024b), the nearest drinking water supply management area is for Walnut Grove, which is located roughly 0.5 mile west of the 150 ft right-of-way of the Preferred Route Segment and just under one mile west of the right-of-way of the Permitted Route Segment.

Public and non-public community water supply source-water protection in Minnesota is administered by the MDH through the Wellhead Protection Program. Wellhead Protection Areas for public and community water-supply wells are delineated based on a zone of capture for 10-year groundwater time-of-travel to the well and are available through a database and mapping layer maintained by MDH (2024c). A search for Wellhead Protection Areas in the MDH database indicated that the Preferred Route Segment right-of-way does not cross a Wellhead Protection Area. The nearest Wellhead Protection Area is located in the town of Walnut Grove, approximately two miles northwest of the Preferred Route Segment and the Permitted Route Segment.

4.5.3.1 Impacts and Mitigation Measures

As is true of the HVTL Project as a whole, Plum Creek does not anticipate any impacts to bedrock during construction or operation of the Preferred Route Segment if the Commission approves Plum as bedrock along the Preferred Route Segment is at depths greater than proposed foundation depths of 18 to 48 feet deep.

Similarly, Plum Creek does not expect any impacts to groundwater resources from the changes described in this request as there are no sole source aquifers or wellhead protection areas within the Preferred Route Segment right-of-way. Additionally, no impacts are anticipated on public or private wells, Wellhead Protection Areas or Drinking Water Supply Management Areas, as these features are not crossed by the anticipated alignment of the Preferred Route Segment. If shallow depths to groundwater resources are identified during geotechnical investigations, specialty structures requiring wider, but shallower, excavation for foundations may be used.

4.5.4 Soils

Soil resources, characteristics, and prime farmland within the Preferred Route Segment are similar to what was presented for the proposed routes in the November 2019 Application and evaluated in the FEIS. Soil characteristics along the Preferred Route Segment were assessed using the USDA's Soil Survey Geographic Database (SSURGO) (Soil Survey Staff, 2024); analysis was also conducted for Permitted Route Segment to allow comparison of the route segments. The SSURGO database is a digital version of the original county soil surveys developed by Natural Resources Conservation Service (NRCS) for use with GIS. It provides the most detailed level of soils information for natural resource planning and management.

4.5.4.1 Soil Characteristics

The SSURGO data shows that the various soil types crossed by the Preferred Route Segment are clay loam or loamy and range from poorly drained to well-drained. Plum Creek reviewed SSURGO data to identify prime farmland, farmland of statewide importance, wind or water erodible soils, hydric soils, soils with revegetation concerns, and soils prone to compaction. Table 4.5.4-1 presents the total acres of each of these soil characteristics that are within the 150-foot right-of-way of the Preferred Route Segment; the same information is provided for the Permitted Route Segment for the purposes of comparison.

Table 4.5.4-1
Summary of Soil Characteristics

Soil Characteristics	Permitted Route Segment		Preferred Route Segment	
	Acres	Percent	Acres	Percent
Total Right-of-Way Acres	136.5	100%	74.2	100%
Prime Farmland [1]	124.2	91.0%	71.7	96.7%
Farmland of Statewide Importance [2]	8.8	6.5%	2.4	3.3%
Wind Erodible [3]	0.0	0.0%	0.0	0.0%
Water Erodible [4]	1.5	1.1%	0.0	0.0%
Hydric [5]	63.1	46.2%	34.0	45.8%

Table 4.5.4-1
Summary of Soil Characteristics

Soil Characteristics	Permitted Route Segment		Preferred Route Segment	
	Acres	Percent	Acres	Percent
Revegetation Concerns [6]	3.5	2.5%	0.0	0.0%
Compaction-Prone [7]	63.1	46.2%	35.3	47.6%

Note: Soils may have more than one characteristic.
[1] Includes soils that meet the prime farmland or prime farmland if a limiting factor is mitigated.
[2] Includes soils classified as farmland of statewide importance by SSURGO.
[3] Includes soils in Wind Erodibility Group designation of 1 or 2.
[4] Includes soils with a slope greater than 15 percent or soils with a K value of greater than 0.35 and slopes greater than 5 percent.
[5] Includes soils that are classified as hydric by SSURGO.
[6] Includes soils with a non-irrigated land capability classification of 4 or greater.
[7] Includes soils in somewhat poor to very poor drainage classes with surface textures of clay loam and finer.

Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pasture, woodland, or other lands). Urbanized land and open water cannot be designated as prime farmland. Prime farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods and is not subject to frequent or prolonged flooding during the growing season. Soils that do not meet the above criteria may be considered prime farmland if the limiting factor is mitigated (e.g., by draining or irrigating) (USDA, NRCS, 2024).

The NRCS also recognizes farmlands of statewide importance, which are defined as lands other than prime farmland that are used for production of specific high-value food and fiber crops (e.g., citrus, tree nuts, olives, fruits, and vegetables). Farmland of statewide importance is similar to prime farmland but with minor shortcomings such as greater slopes or less ability to store soil moisture. The methods for defining and listing farmland of statewide importance are determined by state agencies, typically in association with local soil conservation districts or other local agencies (USDA, NRCS, 2024).

As shown in Table 4.5.4-1, there are 71.7 acres of prime farmland (all categories) and 2.4 acres of farmland of statewide importance within the Preferred Route Segment; this is about 53 fewer acres of prime farmland than is crossed by the right-of-way of the Permitted Route Segment. Soils categorized as prime farmland and farmland of statewide importance are protected under the Farmland Protection Policy Act because of their value for agricultural production, and a significant or irreversible loss of these high-quality farmlands could have local economic impacts for the agricultural industry (refer to Section 4.3.1).

The remaining soil characteristics presented in Table 4.5.4-1 have the potential to influence the methods used for construction of the Preferred Route Segment and the mitigation measures that should be used during restoration of construction workspaces. Compaction-prone soils, particularly within agricultural fields, may require additional mitigation measures during construction to minimize compaction and/or additional protocols during restoration of construction

workspaces. Soils categorized as wind- or water-erodible may require additional mitigation measures to minimize the likelihood of soil migration outside of construction workspaces. Hydric soils are generally indicative of long periods of saturation or flooding during soil formation and can indicate wetland environments if vegetation and other hydrologic factors are present. Soils with revegetation concerns can indicate a need for additional mitigation measures during restoration to ensure revegetation of construction workspaces will be successful. A minimal amount of wind- or water-erodible soils, and soils with revegetation concerns are within the Preferred Route Segment right-of-way. Because of their relative scarcity within the right-of-way, these soil characteristics are not likely to influence the overall impact of the Preferred Route Segment on soils if the Commission approves this request. For this reason, these characteristics are not discussed further in this RPAR.

A hydric soil is a "soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils along with hydrophytic vegetation and wetland hydrology are used to define wetlands" (USDA, NRCS, 2024). Soils that are sufficiently wet because of artificial measures are included in the concept of hydric soils. Also, soils in which the hydrology has been artificially modified are hydric if the soil, in an unaltered state, was hydric. Some soils designated as hydric have phases that are not hydric depending on water table, flooding, and ponding characteristics. A combination of hydric soil, hydrophytic vegetation, and hydrologic properties define wetlands as described in the *National Food Security Act Manual* (Soil Conservation Service, 1994). There are 34.0 acres of hydric soils within the Preferred Route Segment right-of-way as compared to 63.1 acres within the Permitted Route Segment right-of-way.

Soil compaction modifies the structure and reduces the porosity and moisture-holding capacity of soils. Construction equipment traveling over wet soils could disrupt the soil structure, reduce pore space, increase runoff potential, and cause rutting. The degree of compaction depends on moisture content and soil texture. Fine-textured soils with poor internal drainage that are moist or saturated during construction are the most susceptible to compaction and rutting. Soils classified as having somewhat poor to very poor drainage classes and surface textures of clay loam and finer are considered to have a high potential for compaction. There are 35.3 acres of compaction -prone soils within the Preferred Route Segment right-of-way as compared to 63.1 acres within the Permitted Route Segment right-of-way.

4.5.4.2 Impacts and Mitigation Measures

During construction of the HVTL Project, soil compaction and localized soil erosion may occur during clearing and grading of work areas. In addition, potential soil impacts may result from the excavation, stockpiling, and redistribution of soils. Construction of the HVTL Project will predominantly occur within the 150-foot right-of-way. During construction of either the Preferred or Permitted Route Segment, prime farmland crossed by the right-of-way will be temporarily taken out of agricultural production where structures are installed. As discussed in Section 3.3, the footprint of each structure measures approximately 12 feet in diameter which would equate to a small, sporadic impact on areas of prime farmland that is spread throughout the entire length of the HVTL Project. Impacts from installation of structures will not have a meaningful effect on the availability of prime farmland within the state of Minnesota or within Cottonwood and Redwood Counties.

Incorporating the Preferred Route Segment into the HVTL Project will reduce the overall impact on soils, including prime farmland and farmland of statewide importance, because the Preferred Route Segment would impact about 52.5 fewer acres of prime farmland and 6.4 fewer acres of farmland of statewide importance than the Permitted Route Segment.

Plum Creek will comply with the mitigation measures required by the 2021 Route Permit and remains committed to the additional mitigation measures proposed in the November 2019 Application, including:

- Implementing measures to reduce soil compaction during construction and decompaction of soils during restoration of construction workspaces.
- Proper use and installation of best management practices, such as minimizing the number of vehicles in construction workspaces and protection and maintenance of topsoil during right-of-way clearing and construction.
- 2021 Route Permit Condition 5.3.7: Developing a Stormwater Pollution Prevention Plan (SWPPP) that complies with MPCA rules and guidelines; implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion during construction.
- 2021 Route Permit Condition 5.3.19: Compensating landowners accordingly for any localized crop damage and soil compaction that may occur. Refer to Section 4.3.1 for additional information related to agricultural impacts.

4.5.5 Surface Waters

Updated surface water data was reviewed to check for any changes in the RPAR Project Area since the November 2019 Application was filed and the HVTL Project was evaluated in the FEIS. This information was also reviewed to assess the potential impacts on surface water resources from incorporating the Preferred Route Segment into the HVTL Project. Information about surface water resources is also provided for the Permitted Route Segment for the purposes of comparison.

Watersheds are denoted by an 8-digit Hydrologic Unit Codes (HUCs) as assigned by USGS and given a unique name. Both the Permitted Route Segment and Preferred Route Segment are located in the Cottonwood River Watershed (HUC-8: 7020008). The Preferred Route Segment is 3.4 miles shorter than the Permitted Route Segment and the 150-foot right-of-way of the Preferred Route Segment would affect about 62 fewer acres of the Cottonwood River Watershed.

The Preferred Route Segment crosses fewer surface waters than the Permitted Route Segment (refer to Map 7). The Preferred Route Segment crosses six fewer stream and river crossings, and no crossings of impaired waters. In addition, the Preferred Route Segment's 150-foot right-of-way crosses 1.9 fewer non-forested wetland acres and no forested wetlands. Table 4.5.5-1 provides a comparison of surface water features crossed by the Preferred and Permitted Route Segments. Summaries of each surface water feature follow the table.

Table 4.5.5-1 Surface Waters Crossed by the 150-foot Right-of-Way		
Surface Water Feature	**Permitted Route Segment**	**Preferred Route Segment**
Number of Stream and River Crossings	15	9
303(d) Impaired Waters	1	0
Total Wetlands in the 150-foot Right-of-Way (acres)	3.3	0.2
Non-forested Wetlands in 150-foot Right-of-Way (acres)	2.1	0.2
Forested Wetlands in 150-foot Right-of-Way (acres)	1.2	0.0

The following surface water resources are not crossed by the right-of-way of the Preferred Route Segment or the Permitted Route Segment and, therefore, are not discussed further herein:

- Minnesota Public Waters Inventory features
- Minnesota Outstanding Resource Value Waters
- Federal Emergency Management Agency-designated 100- or 500-year floodplains
- Trout streams
- MDNR Designated Wildlife Lakes
- Calcareous fens

4.5.5.1 Lakes, Ponds, Rivers, Streams, and Ditches

Section 404 of the Clean Water Act prohibits any discharge of dredged or fill materials into jurisdictional waters of the United States without a permit from the U.S. Army Corps of Engineers (USACE). Many of the rivers and streams crossed by the Preferred Route Segment are likely to be jurisdictional waters of the United States. Navigable waters are defined by 33 CFR Part 329 as those waters that are subject to the ebb and flow of the tide and/or are presently used, have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Navigable waters are designated by the USACE and regulated under Section 10 of the Rivers and Harbors Act of 1899. Impacts to jurisdictional waters and transmission line crossings of navigable waters both require permits from the USACE.

Plum Creek reviewed the MDNR National Hydrography Dataset (MDNR, 2024d) to assess the presence of lakes, ponds, rivers, streams, and ditches crossed by the Preferred Route Segment right-of-way. The Preferred Route Segment right-of-way crosses nine intermittent stream segments, which is six fewer than the Permitted Route Segment right-of-way (refer to Table 4.5.5-1 and Map 7). According to the MDNR data, the Preferred Route Segment right-of-way does not cross lakes, ponds, rivers, or ditches. The stream segments crossed by the Preferred Route Segment right-of-way are all unnamed streams that are tributaries to Pell Creek. The stream segments crossed by the Permitted Route Segment right-of-way consist of Pell Creek and unnamed streams that are tributaries to Pell Creek.

4.5.5.2 Water Quality

Section 303(d) of the Clean Water Act uses because of various impairments. The list, known as the 303(d) list, is based on violations of water quality standards and listed waters are described as "impaired." In Minnesota, the MPCA has jurisdiction over determining 303(d) waters and last updated its 303(d) list in 2024.

Plum Creek reviewed the MPCA Impaired Waterbodies, Minnesota, 2024 data set (MPCA, 2024g) for the presence of impaired waters. The Preferred Route Segment right-of-way does not cross impaired waters whereas the Permitted Route Segment crosses one stream segment that is listed as impaired for Fishes and Bioassessments.

4.5.5.3 Wetlands

Wetlands are areas with hydric (wetland) soils, hydrophilic (water-loving) vegetation, and wetland hydrology (inundated or saturated much of the year). Wetlands are part of the foundation of water resources and are vital to the health of waterways and communities that are downstream. Wetlands detain floodwaters, recharge groundwater supplies, remove pollution, and provide fish and wildlife habitat. Wetlands are also economic drivers because of their key role in fishing, hunting, agriculture, and recreation. Wetland types include marshes, swamps, bogs, and fens. Wetlands vary widely due to differences in soils, topography, climate, hydrology, water chemistry, vegetation, and other factors.

The USFWS National Wetlands Inventory for Minnesota data was reviewed to assess the presence of wetlands within the Preferred Route Segment right-of-way. Wetlands located within the right-of-way are associated with streams or isolated depressions and classified as palustrine emergent or forested emergent wetland communities. Table 4.5.5-1 summarizes the wetland communities crossed by the Preferred Route Segment right-of-way; wetland communities crossed by the Permitted Route Segment right-of-way are also included for the purpose of comparison. Wetlands are also displayed on Map 7.

Approximately 0.2 acres of National Wetlands Inventory-mapped non-forested wetlands occur within the Preferred Route Segment right-of-way; forested wetlands are not crossed by the Preferred Route right-of-way. This is about 3.1 acres fewer wetlands overall as compared to the right-of-way of the Permitted Route Segment. None of the wetlands crossed by the Preferred Route Segment are Public Waters Inventory wetlands. The Preferred Route Segment design does not currently place structures within wetlands. If redesign is required, structure placement within wetlands along the Preferred Route Segment will be avoided to the extent practicable. If structures need to be placed in wetlands as the result of a future design change, Plum Creek will comply with the conditions in Section 5.3.8 of the 2021 Route Permit.

4.5.5.4 Impacts and Mitigation Measures

The Preferred Route Segment would affect fewer surface water resources than the Permitted Route Segment. Plum Creek remains committed to the mitigation measures identified in the November 2019 Application, as described below, as well as those required in Condition 5.3.8 of the 2021 Route Permit, and obtaining all necessary regulatory approvals for any impacts on surface water resources.

The HVTL Project will have minor, mostly short-term effects on surface water resources. Plum Creek has designed the HVTL Project and the Preferred Route Segment to further minimize or avoid impacts to surface water resources as compared to the Permitted Route Segment. Plum Creek remains committed to spanning surface water resources where practicable.

Plum Creek will obtain a National Pollutant Discharge Elimination System permit from the MPCA for construction of the HVTL Project as noted in the November 2019 Application. Plum Creek will also develop a SWPPP that complies with MPCA rules and guidelines. All waterways crossed will be maintained for proper drainage through the use of temporary culverts or other temporary crossing devices, according to best management practices and permit requirements. If tree removal is required along waterways, trees will be cut so that the root system is not disturbed to retain bank stability. Sediment barriers, if deemed necessary, will be used along waterways and slopes during construction to protect from soil erosion and sedimentation. Additionally, if new access roads for vehicles and equipment are required, access roads will be selected to avoid disturbance to stream banks. No permanent impacts to surface water resources are anticipated from the Preferred Route Segment.

Wetlands

Wetlands located in the Preferred Route right-of-way would be spanned and placement of structures within wetlands would be avoided to the extent practicable. Where it is not possible to span a wetland, Plum Creek remains committed to the mitigation measures proposed in the November 2019 Application and will comply with the conditions of the 2021 Route Permit, including:

- 2021 Route Permit Condition 5.3.8: scheduling construction during frozen conditions;
- 2021 Route Permit Condition 5.3.8: using construction mats when construction during frozen conditions is not feasible;
- using all-terrain construction equipment that is designed to minimize soil impacts in damp areas;
- 2021 Route Permit Condition 5.3.8: using the shortest route to the pole location in the wetland; and
- 2021 Route Permit Condition 5.3.8: assembling structures in upland areas, when feasible, before they are brought to the site for installation.

Wetlands impacted by construction will be restored as required by the USACE. Plum Creek will obtain all appropriate permits and approvals from the USACE, MDNR, local government unit(s), and watershed districts (if necessary) for any impacts on wetlands.

4.5.6 Flora

Vegetation crossed by the Preferred Route Segment is similar to what was described for the Permitted Route Segment in the November 2019 Application and evaluated in the FEIS. As described in Section 4.1, both the Preferred and Permitted Route Segments fall entirely within the Coteau Moraines subsection of the North Central Glaciated Plains Section in the Prairie Parkland

Province, as defined by the Ecological Classification System of Minnesota (MDNR, 2024e). At the time of European settlement, this landscape was dominated by tallgrass prairie and scattered wetlands. The tallgrass prairie was characterized by big bluestem, little bluestem, Indian grass, and sideoats grama. Wet prairies and forest were limited to ravines of a few streams. The wet prairies in the Coteau Moraines Subsection were dominated by bluejoint grass, prairie cordgrass, and sedges, and the riparian forests contained primarily silver maple, cottonwood, elms, and willow (MDNR, 1988; MDNR, 2006; MDNR, 2024e).

Current land use in the Coteau Moraines subsection is now dominated by agriculture, primarily active row crop fields with some pasture. Other current land uses include small amounts of forest, wetlands, open water, and developed areas. Grassland-prairie complexes are typically privately owned and grazed. Few areas of pre-settlement vegetation such as native prairie and floodplain forest remain. Suitable habitat for protected and at-risk plant species may be present in these areas of remnant pre-settlement vegetation (MDNR, 2006). These areas are typically associated with a managed land such as a Wildlife Management Area, an existing conservation easement, and/or are identified as Sites of Biodiversity Significance (SOBS).

Refer to Section 4.3.1 for more information on CREP easements crossed by the Preferred Route Segment. Section 4.5.8.2 discusses SOBS as they relate to the Preferred Route Segment.

4.5.6.1 Impacts and Mitigation Measures

The Preferred Route Segment, because it is shorter, would affect fewer acres of vegetation, and potential species habitat, than the Permitted Route Segment. The acreage of each land cover type crossed by the Preferred Route Segment is provided in Section 4.2.9.1 (refer to Table 4.2.9-1); land cover crossed by the Permitted Route Segment is also provided for the purposes of comparison. The Preferred Route Segment right-of-way predominantly crosses cultivated crop and developed areas (86.8 percent and 12.8 percent of the right-of-way, respectively) compared to the Permitted Route Segment (63.6 percent and 33.7 percent, respectively); refer to Section 4.3.1 for a discussion of impacts and mitigation measures that would be used in cultivated crop land and hay/pasture lands.

As is true of the HVTL Project as a whole, construction of the Preferred Route Segment will result in short-term adverse impacts on existing vegetation, including localized physical disturbance and soil compaction. Construction activities, such as site preparation and installation of structures, are anticipated to impact approximately 0.1 to 0.5 acres of vegetation per structure. Construction activities including construction and use of access roads, staging, and stringing areas would also have short-term impacts on vegetation by concentrating surface disturbance and equipment use. The Preferred Route Segment does not contain any areas currently dominated by forest or other woody vegetation.

Construction of the Preferred Route Segment could lead to the introduction or spread of invasive species and noxious weeds. Construction activities that could potentially lead to the introduction of invasive species include ground disturbance that leaves soils exposed for extended periods, introduction of topsoil contaminated with weed seeds, vehicles importing weed seed from a contaminated site to an uncontaminated site, and conversion of landscape type, particularly from forested to open settings.

Plum Creek remains committed to the mitigation measures identified in the November 2019 Application, as described below, as well as those required in Condition 5.3.9 of the 2021 Route Permit. The primary means of mitigating impacts to flora is to avoid trees, through prudent routing. The Preferred Route Segment effectively achieves this by avoiding woodlots, windrows, and tree breaks.

Impacts to flora can also be mitigated by a number of other strategies. Plum Creek remains committed to the mitigation measures proposed in the November 2019 Application and to complying with the conditions of the 2021 Route Permit, including:

- 2021 Route Permit Condition 5.3.9: Placement of the alignment and of specific structures to avoid trees and other tall-growing species;
- 2021 Route Permit Condition 5.3.9: leaving or replanting compatible plants at the edge of the transmission line right-of-way; and
- 2021 Route Permit Condition 5.3.4: limiting vehicle traffic to roads along the right-of-way.

Potential impacts due to invasive species and noxious weeds can be mitigated. Plum Creek remains committed to the mitigation measures proposed in the November 2019 Application and to complying with the conditions of the 2021 Route Permit, including:

- 2021 Route Permit Condition 5.3.11: avoiding the introduction of invasive species and noxious weeds on equipment or through seeds or mulches;
- 2021 Route Permit Condition 5.3.12: revegetating disturbed areas using weed-free seed mixes and using weed-free straw and hay for erosion control;
- removal of invasive species/noxious weeds via herbicide and manual means; and
- cleaning and inspecting construction vehicles to remove dirt, mud, plant, and debris from vehicles prior to arriving at and leaving construction sites.

4.5.7 Fauna

The wildlife species that inhabit the RPAR Project Area are similar to what was described for the Permitted Route Segment in the November 2019 Application and evaluated in the FEIS. These wildlife species are typical of those found in agricultural and grassland-prairie complexes. Wildlife species that occur in wetland and floodplain or riparian forest may also be present in the vicinity of the Preferred Route Segment. These species include mammals, such as squirrels, fox, and deer; birds, such as robins, killdeer, wild turkey, and wood ducks; fish, such as creek chubs, various shiner species, suckers; mussels, and reptiles and amphibians such as, snakes, turtles, frogs, and toads.

Migratory birds are protected by the Migratory Bird Treaty Act of 1918 (16 U.S. Code [USC] 703-712). The Migratory Bird Treaty Act prohibits taking, killing, possession, transportation, and importation of migratory bird and their eggs, parts, and nests. Additionally, the Bald and Golden Eagle Protection Act (16 USC 668-668d) prohibits taking or possession of and commerce in bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), either alive or dead, or any egg, nest, or part of eagles.

During March 2018 and March 2019, Plum Creek conducted aerial surveys for bald eagle nests within 10 miles of the Plum Creek Wind Project boundary; the survey area for the Wind Project completely overlaps with the Preferred Route Segment. In November 2024, ground-based surveys were conducted within one mile of the Preferred Route Segment. These survey efforts determined that no bald eagle nests are located within one mile of the Preferred Route Segment. Additionally, the MDNR maintains records of documented bald eagle nests in the state's Natural Heritage Information System (NHIS). Based on a review of the data, there are no records of bald eagle nests within one mile of the Preferred Route Segment. It should be noted that since the bald eagle was removed from the endangered species list in 2007, MDNR has not routinely updated the NHIS data with more current bald eagle nest records (that is, the NHIS database is not a comprehensive list of all eagle nests).

Key bird habitats in the United States are designated by The National Audubon Society as Important Bird Areas. The goal of Important Bird Areas is to ensure that bird populations persist by identifying and conserving significant habitats. In Minnesota, 57 Important Bird Areas have

been identified (National Audubon Society, 2024). The Preferred Route Segment does not cross any Important Bird Areas and maintains a similar distance as the Permitted Route to Important Bird Areas in the vicinity.

The Heron Lake Important Bird Area is a state priority Important Bird Area that includes North and South Heron Lakes, several Wildlife Management Areas and Waterfowl Production Areas, and scattered small lakes and wetlands. The Des Moines River Important Bird Area is also a state priority Important Bird Area and includes approximately 61 miles of the Des Moines River, the Des Moines River Prairie Scientific and Natural Area and several small lakes as well as a variety of native habitats through heavily cultivated agricultural lands as well as smaller patches of heavily forested areas in and around Kilen Woods State Park and Belmont County Park.

The Prairie Coteau Complex Important Bird Area is a state priority Important Bird Area made up of 6 non-contiguous but ecologically similar units. Blue Mounds State Park as well as 22 Wildlife Management Areas, 6 Waterfowl Production Areas, and 2 Scientific and Natural Areas fall within the Important Bird Area boundaries. The Upper Minnesota River Valley Important Bird Area is a global priority Important Bird Area encompassing the floodplains, marshes, swamps, and riparian habitat of the Upper Minnesota River; the Important Bird Area provides a variety of key habitats and a corridor for movement in a landscape heavily dominated by agricultural land use (National Audubon Society, 2024).

4.5.7.1 Impacts and Mitigation Measures

Given that the great majority of the land use along the Preferred Route Segment is cultivated cropland, Plum Creek anticipates that the incorporating the Preferred Route Segment into the HVTL Project would not change the fact that potential impacts on wildlife and wildlife habitat during construction and maintenance of the HVTL Project will be minimal. In addition, most impacts on wildlife habitat would be temporary with the exception of any conversion related to Preferred Route Segment features such as concrete foundations. Because the Preferred Route Segment is shorter than the Permitted Route Segment, fewer pole foundations would be needed. Incorporating the Preferred Route Segment into the HVTL Project design would further minimize permanent impacts. Potential impacts on wildlife during construction would be primarily related to temporary disturbance and displacement; however, wildlife may be acclimated to human activity from regular agricultural production activities in the area surrounding the Preferred Route Segment.

As is true of the HVTL Project as a whole, during operations, birds, including eagles, may be injured or killed due to either electrocution or collisions with the transmission line and associated Preferred Route Segment components. Avian collision risk may be greater during certain behaviors such as flushing, courtship displays, and aerial displays; these behaviors may distract birds such that they are less aware of nearby structures. Collision risk may also be greater if a powerline is located between roosting, feeding, or nesting areas. Individuals or species with poor vision, that are young or less agile, or that are unfamiliar with the area may also be at greater risk of collision with transmission lines. Electrocutions typically result when an individual bird's wingspan is equal to or greater than the distance between two energized and/or grounded components of a transmission line (Avian Power Line Interaction Committee [APLIC], 2006).

Plum Creek remains committed to the mitigation measures described in the November 2019 Application, and evaluated in the FEIS, as well as the avian protection measures described in Section 5.3.15 of the 2021 Route Permit. Plum Creek will coordinate with USFWS and MDNR as needed to identify avian movement pathways and migration flyways that may be crossed by the Preferred Route Segment and to discuss areas along the transmission line that may need to be marked with avian flight diverters to minimize impacts to birds. In addition, Plum Creek remains committed to constructing and operating the HVTL Project according to APLIC-recommended standards to reduce the potential for avian collisions and electrocutions (APLIC, 2006; APLIC, 2012).

Based on previous site surveys, no bald eagle nests are located within one mile of the Preferred Route Segment. If eagle nests were present, potential impacts on eagles using these nests would be the same as those described above for other birds—specifically, potential injury or death due to collision and electrocution. Plum Creek remains committed to avoiding and minimizing these potential impacts through coordination with the USFWS and MDNR and adherence to APLIC recommended standards regarding avian collisions and electrocutions, as described above (APLIC, 2006; APLIC, 2012) and in Condition 5.3.15 of the 2021 Route Permit.

4.5.8 Rare and Unique Natural Resources

4.5.8.1 Threatened and Endangered Species

As part of this RPAR, Plum Creek reviewed the USFWS Information for Planning and Conservation (IPaC) website for the federal endangered and threatened species, candidate species, and designated critical habitat that may occur within one mile of the Preferred Route Segment (USFWS, 2024). Plum Creek also reviewed the MDNR's NHIS for documented occurrences of federal- and state-listed species within one mile of the Preferred Route Segment (MDNR, 2024f). Although these reviews do not represent a comprehensive survey, they provide information on the potential presence of protected species and habitat within one mile of the Preferred Route Segment (refer to Table 4.5.8-1 and Appendix F).

Table 4.5.8-1
Federal and State-Listed Species Potentially Present Within One Mile of the Preferred Route Segment

Common Name	Scientific Name	Habitat	Status		Source
			State [1]	Federal [2]	
Insects					
Monarch Butterfly	*Danaus plexippus*	A wide variety of flowering plants in wetland, grassland, roadside, developed, and other areas. Milkweed species required as larval host plant.	NA	Proposed Threatened	USFWS
Suckley's Cuckoo Bumble Bee	*Bombus suckleyi*	A wide variety of flowering plants in prairie, grassland, agricultural, developed, and other areas	NA	Proposed Endangered	USFWS

[1] MDNR, 2024f
[2] USFWS, 2024

Based on the USFWS IPaC review, no federally threatened, endangered species, proposed species, or designated critical habitat have potential to occur within one mile of the Preferred Route Segment.

According to the USFWS IPaC website, the monarch butterfly may occur within one mile of the Preferred Route Segment. On December 12, 2024, the USFWS published a proposed rule to the federal register to list the monarch as threatened with a 4(d) rule. A final rule is expected to be published to the federal register in 12 months, and the listing made effective 30-60 days later (i.e., January or February 2026). Proposed species are not protected under the Endangered Species Act, and as such, a determination of effect is not applicable. However, federal agencies are required to confer with the USFWS on agency actions that may be likely to jeopardize a proposed species.

The IPaC review also identified the Suckley's cuckoo bumble bee as potentially present within one mile of the Preferred Route Segment. On December 17, 2024, the USFWS published a proposed rule to the federal register to list the species as endangered. A final rule is expected to be published to the federal register in 12 months, and the listing made effective 30-60 days later (i.e., January or February 2026). Proposed species are not protected under the Endangered Species Act, and as such, a determination of effect is not applicable. However, federal agencies are required to confer with the USFWS on agency actions that may be likely to jeopardize a proposed species.

According to a review of the MDNR NHIS data, no documented occurrences of state-listed species or state species of special concern were identified within one mile of the Preferred Route Segment.

Impacts and Mitigation Measures

Federally Listed Species

Monarch Butterfly

The monarch has been proposed for listing under the Endangered Species Act. Suitable habitat for monarch butterflies is present in the RPAR Project Area, and HVTL Project activities may have impacts on individuals. If the species is listed prior to the onset of or during construction, Plum Creek will work with the USFWS to develop avoidance and minimization measures to ensure HVTL Project activities will not result in unauthorized take of federally listed species.

Suckley's Cuckoo Bumble Bee

The Suckley's cuckoo bumble bee has been proposed for listing under the Endangered Species Act. Suitable habitat for the species is present in the RPAR Project Area, and HVTL Project activities may have impacts on individuals. If the species is listed prior to the onset of or during construction, Plum Creek will work with the USFWS to develop avoidance and minimization measures to ensure HVTL Project activities will not result in unauthorized take of federally listed species.

State-Listed Species

Based on the review of the MDNR NHIS data dated October 10, 2024, no occurrences of state-listed threatened or endangered species, or state species of special concern were noted within

one mile of the Preferred Route Segment. Plum Creek does not anticipate future documented occurrences of state-listed species in the vicinity of the Preferred Route Segment given that the majority of the land use along the Preferred Route Segment right-of-way is cultivated crop land and developed areas. As such, impacts on state-listed plant species are not anticipated if the Commission approves Plum Creek's amendment request.

4.5.8.2 Natural Resource Sites

Plum Creek reviewed the area within one mile of the Preferred Route Segment for sites that have been specially designated as having notable natural resources. Natural resource sites designated by the State of Minnesota include SOBS, Native Plant Communities, Native Prairie, railroad right-of-way prairie, Wildlife Management Areas, Scientific and Natural Areas, and state parks. Sites with notable natural resource value designated by the federal government include National Wildlife Refuges, wilderness areas, national wild and scenic rivers, national forests, Waterfowl Production Areas, and grassland and wetland easements. Natural resources sites are depicted in Map 8.

MDNR's Minnesota Biological Survey assesses Minnesota landscapes for Native Plant Communities, rare animals, rare plants, and animal communities through desktop review and follow-up field survey. Based on this assessment, Minnesota Biological Survey designates and assigns rankings to SOBS, based on landscape context, Native Plant Communities, and occurrence of rare species populations. The Minnesota Biological Survey groups and ranks SOBS for each of Minnesota's Ecological Classification System subsections for the purpose of designating and cataloguing the state's most notable examples of Native Plant Communities and rare species. Minnesota Biological Survey uses four ranks for SOBS: outstanding, high, moderate, and below (MDNR, 2009). Based on a review of the Minnesota Biological Survey data in the MDNR Minnesota Conservation Explorer review tool, about 5.3 acres of the Ann 6 SOBS fall within the Preferred Route Segment; this SOBS is ranked as moderate. Sites with this ranking contain occurrences of rare species and/or moderately disturbed native plant communities and may have a strong potential for recovery. Most of this SOBS is located outside the Preferred Route Segment right-of-way; however, approximately 0.8 acre of the SOBS falls within the Preferred Route Segment right-of-way.

The MDNR has also classified Native Plant Communities within the state using plant species, soils, and other site-specific data from vegetation plots. The current Native Plant Community classification covers most of the wetland and terrestrial vegetation in the state and was completed in 2003. It is a six-level hierarchical classification that accounts for vegetation structure and geology, ecological processes, climate and paleohistory, local environmental conditions, canopy dominants, substrate, and environmental conditions (Aaseng et al., 2011). Based on a review of the MDNR's Native Plant Community data in Minnesota Conservation Explorer, three Native Plant Communities are located within the Preferred Route Segment; all are Dry Hill Prairie (Southern) Type and are associated with the Ann 6 SOBS (refer to Appendix F). Two of these Native Plant Communities do not fall within the Preferred Route Segment right-of-way, nor are they crossed by the anticipated alignment of the Preferred Route. One Native Plant Community is located within the Preferred Route Segment right-of-way. This site, Native Plant Community code UPs13d, has been given a state rank of S3, "vulnerable to extirpation." Approximately 0.6 acre of

Native Plant Community UPs13d falls within the Preferred Route right-of-way. The Preferred Route Segment does not cross any mapped railroad right-of-way prairie.

The nearest Wildlife Management Area to the Preferred Route Segment is the Plum Creek Wildlife Management Area, which is located approximately 2.5 miles west of the anticipated alignment of the Preferred Route Segment.

The Pell Creek National Wildlife Refuge is located approximately 0.5 mile west of the anticipated alignment of the Preferred Route Segment. However, the National Wildlife Refuge is not located within the Preferred Route right-of-way, nor is it crossed by the Preferred Route Alignment.

The Preferred Route Segment right-of-way does not cross railroad right-of-way prairie, Wildlife Management Areas, Scientific and Natural Areas, or state parks. Additionally, the Preferred Route Segment does not cross National Wildlife Refuges, wilderness areas, national wild and scenic rivers, national forests, Waterfowl Production Areas, grassland and wetland easements, or any other natural resource sites.

Impacts and Mitigation Measures

Plum Creek developed the Preferred Route Segment to primarily cross cultivated crop land and developed land and avoid natural resource sites. The Preferred Route Segment right-of-way intersects small portions of one SOBS and one Native Plant Community; the MDNR recommended in the Natural Heritage Review received on October 10, 2024 that SOBS rated moderate be considered avoidance areas within the permitted boundary; and that impacts to native prairie and prairie remnants be avoided or minimized.

Plum Creek met with MDNR staff on October 21, 2024, to review the updates to the HVTL Project and discuss sensitive resources within the Preferred Route Segment. Plum Creek reviewed the SOBS and Native Plant Community areas with MDNR during the meeting and discussed potential alignment changes, including structure placement outside of these areas.

Plum Creek provided a Keyhole Markup Language file of the Preferred Route Segment, including preliminary structure locations, to MDNR for review on December 11, 2024. On January 14, 2025, MDNR responded via email and noted that vegetation management within the right-of-way is the greatest concern for these areas; more so than structure placement (refer to Appendix F). As such, for all SOBS and Native Plant Communities along transmission lines, MNDR strongly recommends the following actions be taken to reduce impacts:

- Surveying all mapped native plant communities for state-listed species.
- Limit vegetation clearing.
- Restricting herbicide use to spot treatments.
- MDNR review of seed mixes used on or adjacent to the site.
- Habitats with state-protected species may require a large buffer distance from herbicide use.

- The cut and scatter method of cutting understory trees, branches, and brush and scattering them across the site should not be used in sensitive habitats like native prairie where the cleared vegetation consists of invasive species. Brush in these communities should be piled, burned, or removed from the site.

Final alignment of structures, their impacts, and maintenance impacts will avoid the SOBS and Native Plant Community to the extent practicable; however, some clearing immediately adjacent to the Native Plant Community and within the SOBS will be required for Project construction. Plum Creek will continue to engage with the MDNR to develop mitigation measures to minimize impacts in these areas.

Plum Creek remains committed to the mitigation measures identified in the November 2019 Application and to complying with the conditions of the 2021 Route Permit, including:

- Continued coordination with the MDNR to minimize impacts on sensitive resources; and
- 2021 Route Permit Condition 5.3.10: Implementing a Vegetation Management Plan for the Plum Creek Project that includes minimizing chemical use in sensitive areas by avoiding broadcast applications of herbicide and employing spot treatments for control of invasive species.

5.0 FEDERAL AND STATE AGENCY, LOCAL GOVERNMENT, AND PUBLIC INVOLVEMENT

In support of this RPAR, on October 18, 2024, Plum Creek conducted additional outreach to federal, state, and local agencies and tribal governments to introduce the changes requested herein. Copies of agency responses received to date are provided in Appendix F.

Table 5.0-1 identifies agencies and tribal governments that were contacted through meetings or a notification letter and the date that the consultation was conducted.

Table 5.0-1
Plum Creek Agency Correspondence

Agency	Status of Response
Federal	
U.S. Army Corps of Engineers, St. Paul District – Regulatory Branch	No response to date.
U.S. Army Corps of Engineers, La Crescent District – Regulatory Branch	No response to date.
U.S. Fish and Wildlife Service – Midwest Region	No response to date.
U.S. Fish and Wildlife Service – Minnesota Ecological Services Regional Office	No response to date.
U.S. Fish and Wildlife Service – Minnesota-Wisconsin Ecological Services Field Office	No response to date.
Lower Sioux Indian Community – Tribal Historic Preservation Officer	No response to date.
State	
Minnesota Department of Agriculture – Agricultural Development and Financial Assistance Division	No response to date.
Minnesota Department of Commerce - Energy Facility Permitting	Preliminary completeness review received December 13, 2024
Minnesota Department of Employment and Economic Development	No response to date.
Minnesota Department of Health – Environmental Health	No response to date.
Minnesota Department of Natural Resources –Energy Projects Review – State Office and Region 4 (South Region)	Early Coordination Meeting on October 21, 2024. Email December 11, 2024 MDNR Response January 14, 2025
Minnesota Department of Public Safety	No response to date.
Minnesota Department of Transportation (MNDOT) – Office of Aeronautics	No response to date.
MNDOT – Office of Aeronautics - Aero Business and Planning	No response to date.
MNDOT – Office of Land Management	No response to date.
Minnesota Historical Society	No response to date.
Minnesota Office of the State Archaeologist	No response to date.

Table 5.0-1 Plum Creek Agency Correspondence	
Agency	**Status of Response**
Minnesota Pollution Control Agency – Environmental Review Unit	No response to date.
Minnesota State Historic Preservation Office	No response to date.
County	
Cottonwood County – Environmental Office	No response to date.
Redwood County – Environmental Office	No response to date.
Redwood County – Highway Department	No response to date.
Southwest Regional Development Commission	No response to date.
Local Government Units	
Ann Township	No response to date.

5.1.1 State Agencies

5.1.1.1 Minnesota Department of Natural Resources

Plum Creek met with MDNR staff on October 21, 2024, to review the updates to the HVTL Project and discuss sensitive resources within the Preferred Route Segment. As discussed in Section 4.5.8.2, the 150-foot right-of-way of the Preferred Route Segment overlaps the Ann 6 SOBS and an associated Native Plant Community. The Preferred Route Segment alignment, as presented in this RPAR, has been sited based on landowner preferences. Plum Creek reviewed this area with MDNR during the meeting and discussed potential alignment changes that would strike a balance between landowner preferences and protection of state-designated resources.

Plum Creek provided a Keyhole Markup Language file of the Preferred Route Segment, including preliminary structure locations, to MDNR for review on December 11, 2024. On January 14, 2025, MDNR responded via email and noted that vegetation management within the right-of-way is the greatest concern for these areas, more so than structure placement. A list of mitigation measures proposed by MDNR is provided in Section 4.5.8.2.

6.0 REQUIRED PERMITS, APPROVALS, AND CONSULTATIONS

The permits or approvals that may be required for the construction and operation of the HVTL Project are provided in Table 6.0-1; the list in Table 6.0-1 is the same as what was described in the November 2019 Application. Plum Creek will obtain all permits and licenses that are required for the HVTL Project, following approval of the RPAR. Copies of agency correspondence to date are provided in Appendix F.

Table 6.0-1
Status of Potential Permits, Approvals, and Consultations

Administering Agency	Permit, Approval, or Consultation	Status and Applicability to the HVTL Project
Federal		
Federal Aviation Administration	Form 7460-1, Notice of Proposed Construction in compliance with 14 CFR Part 77.9	After the Route Permit Amendment is Ordered by the Commission, Plum Creek will submit Form 7460-1 for the structure locations.
U.S. Army Corps of Engineers (USACE), St. Paul District	Section 404, Clean Water Act – Dredge and Fill	Plum Creek has coordinated with the USACE and conducted a desktop review of wetlands and potential impacts with the MDNR update to National Wetlands Inventory data. Based on this desktop data, the HVTL Project will fall under the Regional General Permit threshold for impacts. Once a route amendment is ordered, Plum Creek will conduct wetland delineations to confirm wetland boundaries and impacts based on final design.
U.S. Fish and Wildlife Service (USFWS)	Endangered Species Act of 1973, Section 9 Incidental or Non-Purposeful Take Permit, if deemed necessary	Based on coordination with USFWS, a Take Permit is not anticipated for the HVTL Project.
State of Minnesota		
Minnesota Public Utilities Commission	Certificate of Need	Issued September 2021
	Route Permit for electric transmission line	Issued September 2021 Route Permit amendment requests submitted February 3, 2025
	Site Permit Amendment for Large Wind Energy Conversion System	Site Permit issued September 2021. Amendments issued January 2022 and July 2023. SPAR submitted February 3, 2025.
Minnesota Pollution Control Agency (MPCA)	Section 401 Clean Water Act Water Quality Certification	Concurrent with Section 404, Clean Water Act – Plum Creek will meet the Minnesota conditions.

Table 6.0-1
Status of Potential Permits, Approvals, and Consultations

Administering Agency	Permit, Approval, or Consultation	Status and Applicability to the HVTL Project
MPCA	National Pollutant Discharge Elimination System Stormwater Permit	After the Route Permit amendment is Ordered by the Commission, Plum Creek will submit National Pollutant Discharge Elimination System Permit. The permit is required to be submitted within 30 days of the start of construction. The National Pollutant Discharge Elimination System permit will cover the HVTL Project and Wind Project.
Board of Water and Soil Resources (BWSR)	Wetland Conservation Act approvals	Plum Creek has coordinated with the USACE and conducted a desktop review of wetlands and potential impacts with the MDNR update to National Wetlands Inventory data. Based on this desktop data, the HVTL Project will fall under the Regional General Permit threshold for impacts. Once a route is ordered, Plum Creek will conduct wetland delineations to confirm wetland boundaries and impacts based on final design.
Minnesota Department of Natural Resources (MDNR)	License to Cross Public Waters	After the Route Permit amendment is issued by the Commission, Plum Creek will submit its License to Cross Public Waters.
MDNR	State Protected Species Consultations	NHIS request submitted 5/29/2024. Plum Creek will continue coordinating with MDNR.
Minnesota State Historic Preservation Office (SHPO)	Minnesota Statutes, Chapter 138 (Minnesota Field Archaeology Act and Minnesota Historic Sites Act)	Plum Creek has coordinated with SHPO, conducted a literature review of the route segments, and avoided and previously identified archaeological sites within the right-of-way. Once a Route Permit amendment is issued by the Commission, Plum Creek will conduct surveys for previously unidentified cultural resources in high-potential areas. Plum Creek will coordinate with SHPO on the protocol and any potential mitigation.
Minnesota Department of Transportation (MNDOT)	Utility Permit on Trunk Highway Right-of-Way (Long Form No. 2525)	Plum Creek is coordinating the MNDOT on crossings of US-14 and MN-68.
MNDOT	Driveway Access	To be obtained prior to construction.
MNDOT	Oversize/overweight permits	To be obtained prior to construction.

Table 6.0-1
Status of Potential Permits, Approvals, and Consultations

Administering Agency	Permit, Approval, or Consultation	Status and Applicability to the HVTL Project
Minnesota Department of Agriculture	Agricultural Impact Mitigation Plan	Plum Creek will prepare an Agricultural Impact Mitigation Plan, and have it reviewed and approved by the Minnesota Department of Agriculture.
Local		
County, Township, City, BWSR	Minnesota Wetland Conservation Act approvals	Plum Creek has coordinated with the USACE and conducted a desktop review of wetlands and potential impacts with the MDNR update to National Wetlands Inventory data. Based on this desktop data, the HVTL Project will fall under the Regional General Permit threshold for impacts. Once a route is ordered, Plum Creek will conduct wetland delineations to confirm wetland boundaries and impacts based on final design.
Redwood County	Floodplain Development Permit	Plum Creek will obtain a Floodplain Permit for structures placed with the floodplains depending on the route designated by the Commission.
County, Township, City	Right-of-way/utility permits	Plum Creek is coordinating with Cottonwood and Redwood Counties.
County, Township, City	Overwidth/overweight loads permits	To be obtained prior to construction.
County, Township, City	Road crossing permits	To be obtained prior to construction.
County, Township, City	Driveway/access permits	To be obtained prior to construction.

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