Line 5 Wisconsin Segment Relocation Project

Wisconsin Department of Natural Resources
Environmental Impact Report

Revised August 2020

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List of Acronyms

Name	Description
24/7	24 hours per day, 7 days per week
°F	degree Fahrenheit
AEA	Agricultural Enterprise Area
API	American Petroleum Institute
APP	Agricultural Protection Plan
AQCR	Air Quality Control Region
ASNRI	Area of Special Natural Resource Interest
ATV	All-terrain vehicle
ATWS	additional temporary workspace
Bad River Band	Bad River Band of Lake Superior Chippewa Tribe
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best management practice
bpd	barrels per day
CAA	Clean Air Act
CCRG	Commonwealth Cultural Resources Group, Inc.
COA	Conservation Opportunity Area
Company	Enbridge Energy, Limited Partnership
CPM	Computational Pipeline Monitoring
DATCP	Wisconsin Department of Agriculture, Trade, and Consumer Projection
DNL	Day-Night Average Sound Level
ECD	Enhanced construction detail
EI	environmental inspector
Enbridge	Enbridge Energy, Limited Partnership
EPP	Environmental Protection Plan
ESA	Endangered Species Act
FPAs	Farmland Preservation Areas
GHGs	greenhouse gases
HUC	hydrologic unit code
ICP	Integrated Contingency Plans
IMP	Integrity Management Plan
IVP	Intelligent Valve Placement
Line 13	Southern Lights Pipeline
Line 67	Alberta Clipper Pipeline
MBTA	Migratory Bird Treaty Act
MFL	Managed Forest Law
MLRA	Major Land Resource Area
MP	milepost
NAAQS	National Ambient Air Quality Standards
NCFEL	North Central Forest Ecological Landscape
NHI	Natural Heritage Inventory

NHPA	National Historic Preservation Act
NO2	Nitrogen Dioxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NST	National Scenic Trail
OHWM	Ordinary high water mark
Pb	lead
PEM	Palustrine Emergent
PHMSA	Pipeline Hazardous Materials Safety Administration
PM10	particulate matter less than 10 microns
PM2.5	particulate matter less than 2.5 microns
PRF	Public Rights Features
Project	Line 5 Wisconsin Segment Relocation Project
Reservation	Bad River Reservation
SCADA	Supervisory Control and Data Acquisition
SCPEL	Superior Coastal Plain Ecological Landscape
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Officer
SNA	State Natural Area
SO2	sulfur dioxide
SSURGO	Soil Survey Geographic Database
TCR	Traditional Cultural Resource
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDNR	Wisconsin Department of Natural Resources
WHS	Wisconsin Historical Society
WOUS	Waters of the United States
WRP	Wetland Reserve Program
WWAP	Wisconsin’s Wildlife Action Plan
WWI	Wisconsin Wetland Inventory

EXECUTIVE SUMMARY

Enbridge Energy, Limited Partnership ("Enbridge" or "Company"), requests authorization from the Wisconsin Department of Natural Resources ("WDNR") and the U.S. Army Corps of Engineers ("USACE") for permits to construct its Line 5 Wisconsin Segment Relocation Project ("Project") in Ashland and Iron Counties, Wisconsin.

On February 11, 2020, Enbridge Energy, Limited Partnership ("Enbridge") submitted a Water Resources Application for Project Permits for the Line 5 Wisconsin Segment Relocation Project ("Project") to the Wisconsin Department of Natural Resources and U.S. Army Corps of Engineers. A subsequent data request response was filed on April 1, 2020. Enbridge has prepared this revised Environmental Impact Report to capture updates due to further refinement of the Project route based on landowner input, completion of wetland/waterbody and archaeological surveys, and constructability reviews. New and/or additional materials have been included, where appropriate. New attachments have been added and ordered sequentially continuing from the February 11, 2020 nomenclature. Enbridge has prepared a similar document updating information in the application filed on February 11, 2020 and the additional information provided on April 1, 2020. The Supplemental Application Information updates are provided under separate cover.

Project Description

Enbridge owns the U.S. portion of the world's longest liquid petroleum pipeline system. Combined with the Canadian portion, the operationally integrated pipeline system spans approximately 3,200 miles across North America and has been in operation since 1950. Detailed information on Enbridge's ownership and structure is included on Enbridge's website at www.enbridge.com.

In 1953, Enbridge's existing Line 5 pipeline became operational. It is a 645-mile interstate pipeline that originates in Superior, Wisconsin, traverses northern Wisconsin and the Upper and Lower Peninsulas of Michigan, and terminates near Sarnia, Ontario, Canada. Enbridge's Line 5 is vital energy infrastructure, with an annual average capacity of 540,000 barrels per day ("bpd"), which transports light crude, including light synthetic, light sweet crude oil, and natural gas liquids[1]; approval of this project will not impact the annual average capacity of 540,000 bpd. Line 5 delivers NGLs to the Plains Midstream Depropanization Facility at Rapid River in Michigan. At the Rapid River facility, much of the NGLs deliveries are converted to propane which is then distributed to heat homes and power industry in the region. The non-propane NGLs are then re-injected back into Line 5 for further downstream processing. In the Lower Peninsula of Michigan, Line 5 accepts light crude oil production at Lewiston, where Line 5 interconnects with MarkWest Michigan Crude Pipeline System. In the Lower Peninsula, Line 5 also delivers crude to the Marysville Crude Terminal that interconnects with the Sunoco Eastern System pipeline, which then transports crude from the Marysville terminal to refineries in Detroit and Toledo. These refineries then produce petroleum products, including gasoline and aviation fuels used by consumers in the surrounding regions. Line 5 throughput is also delivered to the Sarnia terminal where the crude is then delivered to refineries in Ontario, New York State, and Quebec. Line 5 also delivers NGLs to the Plains Fractionation Facility in Sarnia, where it is converted to propane.

[1] Natural gas liquids are hydrocarbons, in the same family of molecules as natural gas and crude oil, composed exclusively of carbon and hydrogen (examples include ethane, propane, and butane).

The Wisconsin portion of the existing Line 5 pipeline crosses Douglas, Bayfield, Ashland, and Iron Counties. Within Ashland County, the existing Line 5 crosses through approximately 12 miles of the Bad River Reservation ("Reservation") of the Bad River Band of Lake Superior Chippewa Tribe ("Bad River Band").

Enbridge and the Bad River Band have been in discussions for several years regarding renewal of pipeline easements on 15 parcels of land through the Reservation. In January of 2017, the Bad River Tribal Council announced their decision to deny renewal of Enbridge's easements. Enbridge entered into mediation with the Bad River Band, and in July 2019, the Bad River Band terminated mediation discussions and filed suit against Enbridge seeking removal of the pipeline from the Reservation.

In response to the discussions with the Bad River Band and the litigation filed in July, Enbridge has developed the proposed Project, which will replace the existing Line 5 pipeline segment that traverses through the Reservation with a new, 30-inch outside diameter pipeline segment to be located entirely outside the Reservation. The Project will allow Enbridge to maintain reliable, economic, and secure committed transportation services for its shipping customers.

In addition to the new pipeline segment, the Project will require the construction of seven new mainline block valves, which will also function as Emergency Flow Restricting Devices, and cathodic protection facilities. No new pump stations will be required; however, minor modifications will occur at the existing Ino Pump Station located in Bayfield County, Wisconsin. A modification to an existing mechanical device that reduce pipe internal friction will be installed at the Ino Pump Station. The new, 30-inch outside diameter pipeline segment will be constructed of high yield carbon steel pipe and be coated for corrosion resistance.

Existing Environment

The Project pipeline route crosses approximately 30.6 miles of Ashland County and 10.5 miles of Iron County in Wisconsin. Two mainline block valves will be installed in Bayfield County, three in Ashland County and two in Iron County. Ashland County is approximately 32 percent wetlands. Bayfield County is approximately 12 percent wetlands, and Iron County is approximately 31 percent wetlands (based on WDNR Wisconsin Wetland Inventory ["WWI"] data). The Project is in the Lake Superior drainage basin. WDNR watersheds crossed by the pipeline route include Fish Creek, Lower Bad River, White River, Marengo River, Upper Bad River, Tyler Forks, Potato River, and Montreal River.

The Project crosses the Superior Coastal Plain and North Central Forest Ecological Landscapes (WDNR 2012). The Superior Coastal Plain Ecological Landscape ("SCPEL") includes deep layers of lacustrine clays and limited organic soils. Lake Superior largely influences the SCPEL, which has an abundance of freshwater resources, such as rivers and wetlands. Historic logging has affected the SCPEL such that forest fragmentation is common in the area. However, aspen-dominated forests are abundant in areas, and some small stands of old-growth hardwood forests remain on the Apostle Islands. The North Central Forest Ecological Landscape ("NCFEL") includes sandy loams, sands, and silts. Organic soils and peats are common in lowland areas. Moraines and kettle depressions with steep ridges characterize the NCFEL. Similar to the SCPEL, the NCFEL has an abundance of freshwater resources. A heavily forested landscape, the NCFEL consists of predominantly hardwood forests.

Alternatives

Enbridge has evaluated several alternatives to avoid and/or minimize impacts to environmental resources, while still meeting the Project purpose, taking into consideration factors such as natural resource impacts, technical constraints, and cost.

Environmental Effects

The Project will require installation of the pipeline segment across numerous waterbodies and wetlands. The majority of the Project impacts will be temporary and short-term in nature as a result of construction activities. There will be minimal long-term effects due to operation and maintenance of the pipeline. Long-term effects will include conversion of forested and shrub-scrub habitats to open habitat within the maintained pipeline easement and minor disturbance associated with routine operational maintenance of the pipeline and operational corridor, such as routine brush and tree removal from the maintained pipeline easement. Additional minor long-term effects will occur at the respective valve locations through conversion of the existing land use. Project construction activities will result in 103.1 acres of temporary wetland disturbance; 33.9 acres of forested and scrub-shrub wetland conversion to emergent wetland habitat associated with maintenance of the permanent right-of-way; and 0.02 acre of permanent wetland fill from aboveground facilities.

Enbridge has completed cultural resource surveys along the route. Enbridge will consult with the U.S. Army Corps of Engineers, who in turn will consult with Wisconsin Historical Society, and Native American Tribes, as applicable based on the identification of potentially eligible cultural resource sites. In addition, Traditional Cultural Resource surveys have been conducted to identify areas of historical and cultural significance to the Tribes.

Air quality impacts directly associated with construction of the Project include mobile source emissions from fossil-fueled construction equipment and fugitive dust. However, the Project will not increase emissions from any stationary sources operated by Enbridge in Wisconsin. The Project will not result in an increase in the terminal throughput capacity or result in increased withdrawal loss emissions from Superior Terminal storage tanks. Modifications to the Ino Pump Station will also not result in increased emissions. There will be no change in operational emissions from the Project, and the Project will not cause or contribute to a violation of any federal, state, or local air quality standards.

The project crosses hydric and prime farmland soils. Changes to soil characteristics would be minimized with the use of construction techniques including topsoil segregation and erosion control measures. The groundwater in the project area is typically shallow, less than 50 feet from the surface. Approximately 2.0 miles of terrain with slopes greater than 20 percent would be crossed by the Project. Trench and slope breakers would be used to manage surface and groundwater flow along the Project pipeline.

The Project is located in a rural part of Wisconsin and in general, the pipeline route avoids population centers and residential areas. Much of the route is in forest, grassland, and agricultural areas. During construction, there will be temporary increases in local population, demand for short-term housing, use of transportation systems, and expenditures in local economies for goods and services. There will be a state tax benefit in the form of property and/or ad valorem taxes from the Project pipeline.

Other than inspections from vehicles and routine removal of brush and trees, there will be little disturbance to the corridor and long-term effects due to operation and maintenance of the Project pipeline. Enbridge has state-of-the-art safety, inspection, and maintenance systems in place that exceed federal standards and minimize the likelihood of a release, Enbridge's leak detection systems also exceed federal standards and enhance the ability to identify the location of a release so that the pipeline can be shut down quickly and safely. Further, Enbridge has comprehensive emergency response procedures in place to rapidly respond to and clean up spills in accordance with strict environmental regulations.

1 PROJECT'S PURPOSE AND NEED

1.1 LINE 5 SYSTEM

Enbridge Energy, Limited Partnership ("Enbridge" or "Company") owns and operates the United States portion of the world's longest liquid petroleum pipeline system. Combined with the Canadian portion of the pipeline system, owned by Enbridge Pipelines, Inc., the operationally integrated pipeline system spans approximately 3,200 miles across North America and has been in operation since 1950. Detailed information on Company ownership and structure is included on the Company's website at www.enbridgepartners.com or www.enbridge.com. Enbridge's pipeline system transports crude petroleum to serve refineries in the Midwestern states. Enbridge also transports smaller volumes of crude oil from the western U.S. through an interconnection with Enbridge Pipelines (North Dakota) LLC and from the Gulf of Mexico coast via interconnections with other pipeline systems.

Enbridge owns and operates the 645-mile-long, 30-inch outside diameter Line 5 pipeline, originally installed in 1953, as part of its U.S. mainline system. The pipeline originates at Enbridge's Superior Terminal, located in Superior, Wisconsin, traverses northern Wisconsin and the Upper and Lower Peninsulas of Michigan, and terminates in Sarnia, Canada. Line 5 has an annual average capacity of 540,000 barrels per day ("bpd") of light crude, including light synthetic, light sweet crude oil, and natural gas liquids ("NGLs") volumes. Line 5 is a critical conduit for refineries in the region, delivering essential feedstock that is refined into propane, gas, diesel, jet fuel, and other products.

In Wisconsin, the existing pipeline crosses Douglas, Bayfield, Ashland, and Iron Counties. Within Ashland County, the existing Line 5 pipeline crosses through approximately 12 miles of the Bad River Reservation ("Reservation"). Enbridge and the Bad River Band of Lake Superior Chippewa Tribe ("Bad River Band") have been in discussions for several years regarding renewal of pipeline easement on 15 parcels of land through the Reservation. In January of 2017, the Bad River Tribal Council announced their decision to deny renewal of Enbridge's easements on Allottee Lands (lands held in trust by the U.S. Government for the benefit of Individual Indian Allottee Landowners established through the General Allotment Act of 1887; also known as the Dawes Act) crossed by the existing Line 5. Enbridge subsequently entered into confidential mediation with the Bad River Band.

In July 2019, the Bad River Band terminated mediation discussions with Enbridge and filed a lawsuit in federal court seeking an order requiring Enbridge to remove its Line 5 pipeline from the Reservation among other claims. In response to this litigation and discussions with the Bad River Band regarding its preferences for Line 5 to be removed from the Reservation, Enbridge developed the Line 5 Wisconsin Segment Relocation Project ("Project") to reroute the existing Line 5 pipeline around the exterior boundaries of the Reservation while still maintaining current deliveries. The proposed Project will replace approximately 20 miles of the existing Line 5 pipeline, including the approximate 12 miles of pipeline within the Reservation, with approximately 41.1 miles of a new, 30-inch outside diameter pipeline segment that will be located entirely outside the exterior boundaries of the Reservation. The new pipeline segment would begin near the intersection of State Highway 137 and State Highway 112 in Ashland County and extend to approximately the intersection of US Highway 2 and State Highway 169 in Iron County. Enbridge will construct an interconnection between the existing Line 5 pipeline and the new replacement segment pipeline at the Project start and end points (see Figure 1.1-1). After the Project is in service, the pipeline would no longer operate within the Reservation, but would continue to serve customers through Enbridge's transportation and delivery of NGL and light crude oil on Line 5.

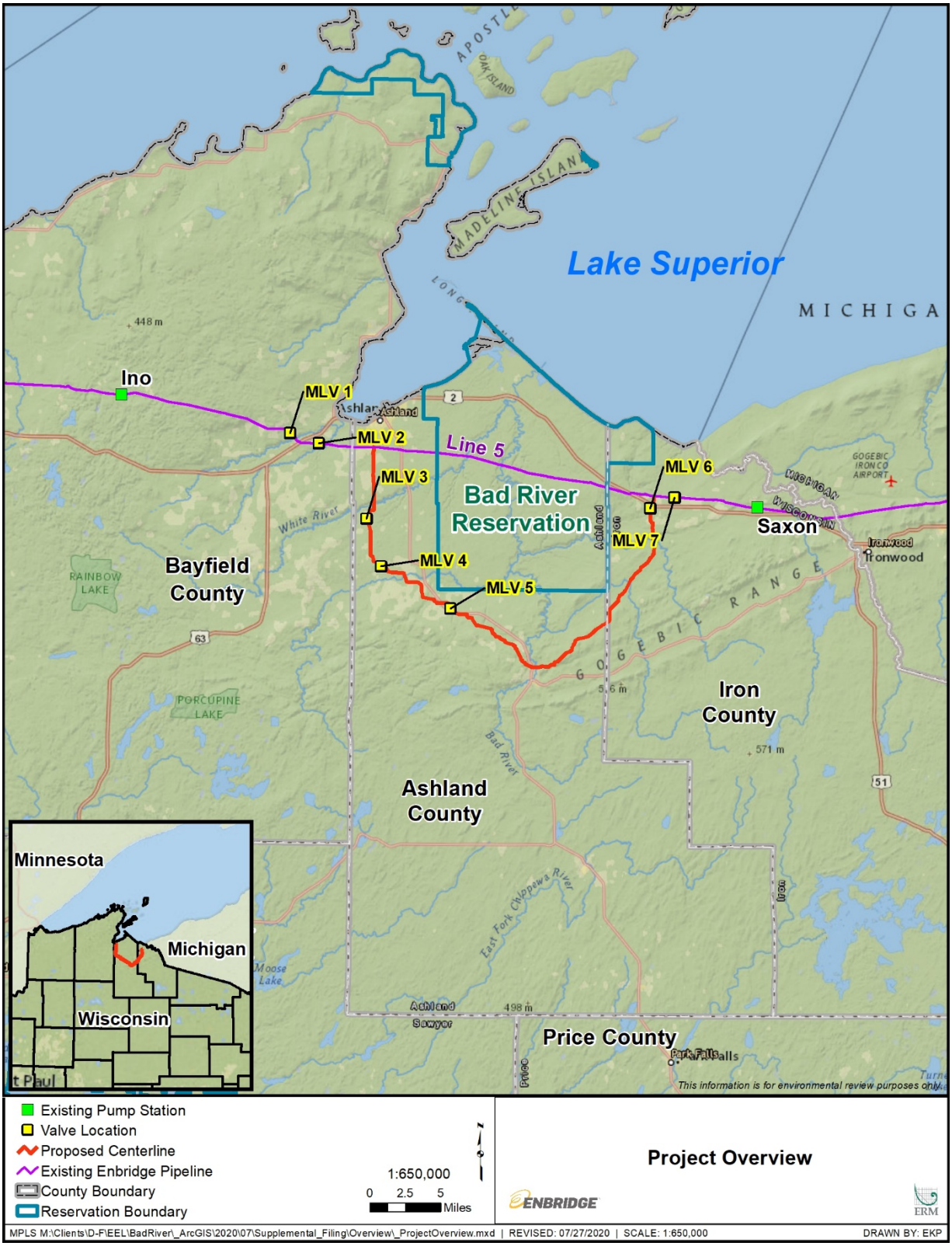

Figure 1.1-1: Project Overview Map

Line 5 delivers NGL to the Plains Midstream Depropanization Facility in Rapid River, Michigan. Propane is extracted from the NGL stream and the depropanized NGL stream is returned to Line 5 for transport to the Sarnia area. The propane extracted at Rapid River provides propane to both Wisconsin and Michigan residents. Additionally, Line 5 provides receipt of light oil production at Lewiston, Michigan where it interconnects with the MarkWest Michigan Crude Pipeline System. Line 5 also delivers crude to the Marysville Crude Terminal that interconnects to the Sunoco Eastern System pipeline, which transports crude from the Marysville terminal to refineries in Detroit and Toledo. Line 5 throughput is delivered to the Sarnia terminal where it is then transported to refineries in Ontario, New York State, and Quebec. NGLs are also delivered to the Plains Fractionation Facility in Sarnia. The Project will allow Enbridge to continue to facilitate the uninterrupted deliveries of propane to Wisconsin and Michigan, as well as to maintain reliable, economic, and secure committed transportation services for Enbridge's shipping customers.

1.1.1 Permanent Decommissioning of Replaced Segments of Line 5 from Service

Enbridge will permanently decommission the portion of the exiting Line 5 between the interconnect points from active service once the proposed Project is completed.

Federal regulations[2] consider a pipeline "abandoned"[3] once permanently removed from service. The regulatory requirements for abandoned pipelines minimize safety hazards and environmental hazards. In addition to these federal regulations, Enbridge will follow industry guidelines and standards for permanently decommissioning the existing Line 5 pipeline segment from service. Enbridge will purge and clean the oil from the decommissioned pipeline segment.

1.1.1.1 Governing Requirements and Scope

In compliance with Code of Federal Regulations ("CFR") 49, Part 195 paragraphs 195.59 and 195.402, Enbridge's procedure sets out the methods by which Enbridge will:

- Safely disconnect Line 5 from all operating facilities, such as pump stations and terminals;
- Purge Line 5 of all combustibles;
- Seal the ends of any pipeline segments left in place; and
- File a report with the Pipeline and Hazardous Materials Safety Administration ("PHMSA") that identifies locations of abandoned pipeline segments that cross over, under, or through a commercially navigable waterway.

Enbridge's procedures will also incorporate the American Society of Mechanical Engineers B31.4-2012, paragraph 457 guidelines on abandoning a piping system through:

- Purging the line of the transported liquid and vapor with an inert material and sealing the ends; and
- Disconnecting the line from all sources of transported liquid, such as other pipelines, meter stations, control lines, and other appurtenances.

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2 49 CFR 195.402.

3 Operations & Maintenance Enforcement Guidance, 49 CFR Part 195, Subpart F.

2 PROPOSED PROJECT DESCRIPTION

2.1 LINE 5

The Project would reroute the existing Line 5 pipeline around the Reservation and replace approximately 20 miles of the existing Line 5 pipeline, including the segment of the existing Line 5 pipeline that traverses through the Reservation, with a new, 30-inch outside diameter pipeline segment that would be located entirely outside the Reservation.

The Project is located in Ashland, Bayfield, Douglas, and Iron Counties, Wisconsin. Project activities in Douglas County will be restricted to the use of a material storage yard at an existing commercial facility. Enbridge has made minor modification to the route proposed in Enbridge's February 11, 2020 application materials where practicable to incorporate landowner requests, improve constructability, and/or reduce resource impacts.

The Project involves the construction and operation of various types of equipment or facilities, including:

- Approximately 41.1 miles of new, 30-inch outside diameter pipeline;
- Cathodic protection and AC mitigation facilities;
- Seven mainline block valves;
- Four pipe yards and contractor yards; and
- Minor modifications to the existing Ino Pump Station.

Figure 1.1-1 provides a general location map depicting the Project route. The route is located within the U.S. Army Corps of Engineers ("USACE") – St. Paul District and the Wisconsin Department of Natural Resources ("WDNR") Northern Region. The Project occurs within the following Township, Range, and Sections:

- (T45N R1W) Sections: 5, 6, 7, 8, 18
- (T45N R2W) Sections: 1, 2, 13, 14, 22, 23, 27, 28, 29, 30, 31, 32, 33
- (T45N R3W) Sections: 6, 7, 8, 9, 14, 15, 16, 22, 23, 24, 25, 36
- (T45N R4W) Sections: 1, 2
- (T46N R1W) Sections: 3, 4, 10, 15, 16, 17, 20, 21, 22, 27, 28, 29, 32, 33
- (T46N R4W) Sections: 5, 6, 7, 8, 17, 18, 20, 27, 28, 29, 34, 35
- (T47N R1W) Sections: 33, 34, 35
- (T47N R4W) Sections: 3, 8, 17, 20, 29, 32
- (T47N R5W) Section: 8, 10
- (T48N R13W) Section: 16
- (T48N R4W) Section: 34
- (T48N R7W) Section: 29

2.1.1 Route

The Project route begins where Line 5 is located near the intersection of County Highway 112 and Summit Road in Ashland County, Wisconsin approximately 4.5 miles west of the western boundary of the Reservation. The route proceeds south, paralleling an overhead electrical transmission line for approximately 3.6 miles. The route then turns southwest to cross the White River, just downstream of the Northern States Power Company hydroelectric dam located on Highway 112. The route continues south for approximately 4 miles where it crosses State Highway 112. The route then continues east/southeast for

approximately 13 miles, crossing the Marengo River near Marengo River Road/Highway 112; the Brunsweiler River near the intersection of County Highway C and Van de Bruggen Road; Trout Brook near the intersection of North York Road and Highway 13; and Silver Creek near the intersection of Ryefield Road and County Road C.

The route turns east, crossing State Highway 13 approximately 0.25 mile north of the intersection of State Highway 12 and State Highway 169. The route crosses the Bad River south of Copper Falls State Park and north of the town of Mellen. The route then turns northeast for approximately 15 miles. It crosses Feldcher Creek just east of the Ashland/Iron County line and south of Casey Sag Road; Tyler Forks River south of Vogues Road; the Potato River just south of the intersection of North Curry Road and Curry Road; and U.S. Highway 2 near the intersection of Highway 2 and Le Duc Road. Finally, the route rejoins Enbridge's existing Line 5 east of Le Duc Road and east of Cedar, Wisconsin, approximately 3.3 miles east of the eastern border of the Reservation.

2.1.2 Landowners

2.1.2.1 Public Outreach

Enbridge initiated outreach with landowners and local, county, state, and federal elected officials within the Project area in August 2019. Enbridge sent all elected officials and landowners of record within an identified study corridor a mailing introducing the Project in their area. Included in the distribution were mayors, city managers, city council members, county commissioners, treasurers, assessors, engineers, economic development directors, governors, attorney's general, state agency commissioners, state legislators and legislative leadership, and members of the U.S. Congressional delegation. Since the initial notification, Enbridge hosted three tours of the existing Saxon Pump Station, located in Iron County, Wisconsin to provide elected officials and project stakeholders with information on operations of the pipeline system. Participants included public officials from Ashland County, Iron County, the city of Hurley, the city of Montreal, private landowners, and media reporters. Enbridge has also presented Project information at Ashland County and Iron County Board meetings as well as at a City of Mellen Council Meeting.

Enbridge conducted an open house in the City of Mellen on September 30, 2019. Approximately 20 people attended. Enbridge promoted the open house through an ad in the local newspaper, individual invitations, flyers distributed locally and on the Line 5 Wisconsin Segment Relocation Project website (www.enbridge.com/L5Wis) to engage potentially impacted and adjacent landowners.

Furthermore, while issuance of permits under Chapter 30 and Wis. Stat. § 281.36 (which include the water quality certification issued under NR 299, Wis. Admin. Code) are "integrated analysis actions" under NR 150.20(a) and do not require separate review under the Wisconsin Environmental Policy Act ("WEPA"), Enbridge understands that the WDNR plans to issue a notice of intent to prepare an Environmental Impact Statement and hold public scoping meetings in the Project area. This process will provide stakeholders with opportunities to provide public comments to the WDNR, and potentially, the Wisconsin Public Service Commission ("WPSC"), if a Public Interest Determination proceeding is undertaken. Enbridge hosted three more open houses in the affected area the week of February 17th and will continue to conduct public outreach efforts throughout the process.

2.1.2.2 Land Ownership

The Project route predominantly crosses private lands located outside of municipal areas. The Project will not cross federal, state, or Native American Reservation owned/managed land. The Project will cross approximately 7 miles of land owned by Iron County managed for forest products. Enbridge will work with the municipalities to obtain all applicable permits. Construction activities through county forestland could temporarily disrupt recreational uses on and adjacent to the right-of-way. Enbridge will work with local, state, and federal agencies to minimize potential impacts associated with construction across county forestland.

Enbridge conducted a 40-year title history review of properties potentially affected by the Project to identify land restrictions associated with conservation easements, such as Conservation Reserve Program, Conservation Reserve Enhancement Program, or Wetland Reserve Program. Enbridge is working with the individual landowners regarding these conservation easements and the potential Project effect to those easements.

As discussed above, Enbridge is committed to working with and providing information to landowners about the Project and keeping them informed throughout all phases of the Project. Enbridge notified affected landowners of the Project by mail. In addition, Enbridge's Land Agents are contacting affected landowners to discuss the Project, acquire survey permission, establish easement options, and document specific concerns they may have. Enbridge will maintain close contact with the landowners along the route before, during, and after construction. Enbridge has reached option and/or easement agreements with 100 percent of landowners along the proposed route.

2.1.3 Project Schedule

Subject to receipt of required regulatory approvals and permit authorizations, Enbridge proposes to begin construction of the Project in early 2021. Enbridge anticipates the pipeline replacement segment to be connected to the existing Line 5 and to be placed in-service in the third quarter of 2021. Enbridge will continue restoration efforts until Project areas have been restored in accordance with permit conditions and landowner agreements. A detailed Project schedule is included as Table 2.1.3-1.

2.1.4 Connected Actions

Power to Mainline Block Valve

Enbridge has revised the number and location of proposed mainline block valves (see Section 3.1.5 of the Supplemental Application Information, submitted under separate cover). Enbridge is continuing to work with local electrical service providers to establish permanent electrical service to the revised mainline block valve locations.

Table 2.1.3-1: Proposed Project Schedule

Enbridge L5WSRP Construction Schedule for Permitting

Schedule dates and durations are approximate and subject to change pending receipt of permits.
Seasonal considerations such as species and waterbody timing restrictions may result in modifications to dates illustrated below.

ID	Task Name	Start	Finish	Duration
1	Permits Received	2/8/2021	2/8/2021	0w
2	Construction ROW Staking	2/9/2021	5/24/2021	15w
3	Start ROW Clearing	2/10/2021	4/20/2021	10w
4	Utility Sweeps	2/10/2021	4/20/2021	10w
5	Access Grading & Site Prep	2/10/2021	5/11/2021	13w
6	Rock Blasting	3/1/2021	5/14/2021	11w
7	Begin HDD Crossings	3/1/2021	6/25/2021	17w
8	Mainline ROW Grading	5/17/2021	7/2/2021	7w
9	Hauling & Stringing Pipe	5/27/2021	7/14/2021	7w
10	Facilities Field Work	6/1/2021	8/9/2021	10w
11	Pipe Bending	6/1/2021	7/19/2021	7w
12	Welding of Pipe	6/7/2021	7/23/2021	7w
13	Pipe Coating	6/8/2021	7/26/2021	7w
14	Ditching	6/14/2021	7/30/2021	7w
15	Lowering In of Pipe	6/15/2020	7/31/2020	7w
16	Backfill Ditch	6/16/2021	8/3/2021	7w
17	ROW Restoration	6/21/2021	11/5/2021	20w
18	Hydrotesting of Pipe	7/26/2021	8/6/2021	2w
19	Commissioning & Tie-In	8/4/2021	8/31/2021	4w
20	In-Service Date	9/1/2021	9/1/2021	0w

2.2 AUTHORITIES AND APPROVALS

2.2.1 Federal Agencies

The following federal permits and consultations are required for the Project:

- Section 404 Clean Water Act / National Environmental Policy Act review
- Section 106 National Historic Preservation Act ("NHPA") Consultation
- Section 7 Endangered Species Act ("ESA") Consultation
- Migratory Bird Treaty Act ("MBTA") Consultation

2.2.2 Wisconsin Department of Natural Resources

2.2.2.1 Chapter 30 Permit

Enbridge is requesting the following permits and approvals:

- Temporary Bridges (Wis. Stat.§30.123, Section 404 Clean Water Act)
- Grading (Wis. Stat. §30.19, Section 404 Clean Water Act)
- Utility Crossing (Wis. Stat. §30.20 and 30.12, Section 404 Clean Water Act)

2.2.2.2 Wetland Water Quality Certification

Enbridge is requesting a Wetland Water Quality Certification (Wis. Stat. § 281.36 and Wis. Adm. Code Chapter NR 299, Section 401 Clean Water Act) for the above activities as well as the following activities:

- Temporary matting in wetlands for construction and access (Section 404 Clean Water Act)
- Trench and bore pit backfill in wetlands (Section 404 Clean Water Act)

2.2.2.3 Stormwater Permit and Hydrostatic Test Water Appropriation/Discharge

Enbridge will request authorization to discharge construction stormwater under NR 151 and NR 216 by submitting a Notice of Intent for stormwater coverage for the Project to WDNR for review. Enbridge intends to request authorization to discharge hydrostatic test waters under the Wisconsin Pollutant Discharge Elimination System permit program (Wis. Stat. Ch. 283). Enbridge anticipates submitting the Hydrostatic Test Discharge Permit application after the new General permit is issued in early 2021, per a recommendation from the WDNR.

2.2.2.4 Air Permit

The Project will not require a Prevention of Significant Deterioration Construction Permit or modification of Enbridge's existing Title V Operating permit for Enbridge's Superior Terminal, located in Superior, Wisconsin as the Project will not change the Superior Terminal's throughput, or capacity on the existing Line 5 system. Additionally, no air permits will be required for any work required to be completed on the Ino Pump Station.

2.2.2.5 Incidental Take

Enbridge is coordinating with the WDNR Bureau of Natural Heritage Conservation to fulfill its National Heritage Inventory ("NHI") endangered resources review requirements, which may include requesting an incidental take permit for impacts on state listed resources. Enbridge will continue to consult with WDNR regarding impacts on state protected species.

2.2.2.6 Wisconsin Environmental Policy Act

In addition to the above listed permits, Enbridge understands that the WDNR intends to prepare an Environmental Impact Statement under NR 150 (Wis. Adm. Code) to ensure that the WDNR and the interested public have the information to consider the short- and long-term effects of the Project's actions on the quality of the human environment. Furthermore, the WDNR is responsible for consultation with the Voigt Intertribal Task Force regarding tribal issues. The Voigt Intertribal Task Force, a part of the Great Lakes Indian Fish and Wildlife Commission, recommends policy regarding inland harvest seasons and resource management issues.

2.2.3 Public Service Commission of Wisconsin

Enbridge has reached option and/or easement agreements with 100 percent of landowners along the proposed route; therefore, Enbridge has withdrawn its Public Interest Determination request from the Public Service Commission.

2.2.4 Wisconsin Department of Agriculture, Trade, and Consumer Protection

Enbridge developed an Agricultural Protection Plan ("APP") (Attachment A) to minimize impacts to farmland in Wisconsin. Enbridge's APP identifies measures that Enbridge will implement to avoid, mitigate, or provide compensation for agricultural impacts that may result from pipeline construction.. The APP will be implemented to minimize impacts on agricultural lands, and Enbridge will work with each individual landowner regarding construction across and restoration of agricultural land.

2.2.5 Wisconsin Department of Transportation

Enbridge will apply for all necessary crossing, conditional use, and zoning permits for roads and county roads the Project crosses (Wis. Stat. §86.07[2]).

2.2.6 Wisconsin Historical Society

Enbridge has completed surveys of the Project area to identify sites and structures listed on, or eligible for listing on, the National Register of Historic Places ("NRHP"). The USACE will consult with the Wisconsin Historical Society ("WHS") regarding these sites to satisfy the requirements of Section 106 of the NHPA.

Enbridge has also conducted a Traditional Cultural Resources (TCR) survey and interviews with citizens of tribal nations to identify Traditional Cultural Properties that may be considered eligible under NRHP and other areas that may have historical and cultural significance. Enbridge has also developed an Unanticipated Discoveries Plan (refer to Attachment B filed on February 11, 2020) for use during all Project construction activities. The Unanticipated Discoveries Plan prescribes actions to take in the event that previously unrecorded archaeological or historic site or human remains are discovered during construction activities.

2.2.7 County and Local Government Interests

Enbridge will submit County/Local permit applications for construction activities, as applicable.

Construction across any paved roads, highways, or roadways will be subject to the requirements of the necessary state and local permits. Enbridge will obtain these permits prior to the start of construction.

2.2.8 Status of Wisconsin Required Permits and Approvals

Table 2.2.8-1 provides the status of the required local, state, and federal permits for the Project.

Table 2.2.8-1: Preliminary List of Government Authorities and Titles of Permits/Approvals

Name of Agency	Title of Permit/Approval	Date of Application / Consultation	Anticipated Date of Decision	Status
United States Army Corps of Engineers—St. Paul District	Clean Water Act Section 404	February 2020		In progress
United States Fish and Wildlife Service	Endangered Species Act Consultation	Summer 2020		In progress
Wisconsin Department of Natural Resources	Chapter 30 Permit / NR 103 Water Quality Certification	February 2020		In progress
	NR 150 Wisconsin Environmental Policy Act Compliance (joint review with the Line 5 Pipeline Project)	February 2020		In progress
	State Endangered Resources Review / Incidental Take Permit (joint review with the Line 5 Pipeline Project)	January 2020		In progress
	Temporary Water Use Permit	Summer 2020		
	Hydrostatic Test Discharge Permit	First quarter 2021 [a]		
	WPDES General Construction Stormwater Permit—Pipeline Construction	Summer 2020		
Wisconsin Historical Society—State Historic Preservation Officer (Section 106)	Cultural Resources Consultation, NHPA Section 106 Clearance	Fall 2019		In progress
Wisconsin Department of Administration	Coastal Zone Management Federal Consistency Review	February 2020		In progress
Wisconsin Department of Transportation	Road Crossing Permits	Summer 2020		

Notes:

[a] Enbridge anticipates submitting the Hydrostatic Test Discharge Permit application after the new General permit is issued in early 2021, per a recommendation from the WDNR.

NHPA = National Historic Preservation Act; WPDES = Wisconsin Pollutant Discharge Elimination System

3 ALTERNATIVES

While NR 150.03(2) defines "alternatives" as "other actions or activities which may be reasonably available to achieve the same or altered purpose of the proposed action or project, including the alternative of no action," a "practicable alternative" is defined in Wisconsin Administrative Code § NR 103.07(2) and § NR 350.03(23) as one "available and capable of being implemented after taking into consideration cost, available technology and logistics in light of overall project purpose." Accordingly, Enbridge evaluated practicable alternatives to determine whether the Project would avoid or minimize impacts on natural resources, reduce or eliminate engineering and constructability concerns, and avoid or minimize conflicts with existing or proposed residential and agricultural land uses.

Enbridge identified and evaluated alternatives to the Project to determine whether the alternatives would be available, reasonable, environmentally preferable, and still fulfill the purpose of the Project. These alternatives include the No-Action Alternative, system alternatives, and route alternatives. Enbridge used the following criteria for considering alternatives:

- Ability to meet the Project purpose and need;
- Significant environmental advantages over the Project; and
- Technical and economic feasibility.

Not all conceivable alternatives have the ability to meet the Project purpose and need. Enbridge will not pursue an alternative that does not meet the Project purpose and need. In addition, not all conceivable alternatives are technically or economically feasible. Some alternatives may be impractical because they are unavailable and/or cannot be implemented after taking into consideration costs and logistics in light of the overall Project purpose. Enbridge focused its analysis on those alternatives that may reduce impacts and/or offer substantial environmental advantages without merely transferring impacts from one area or group of landowners to another. The following subsections describe Enbridge's process for selecting the Project route and provide an analysis of alternatives.

3.1 COMPARISON OF ALTERNATIVES

3.1.1 No-Action Alternative

Under the No-Action Alternative, Enbridge would not construct the proposed Project. In order for Enbridge to maintain service to its customers via the existing Line 5 pipeline, Enbridge would have to reach an agreement with the Bad River Band regarding the easements on the Allottee parcels and the associated lawsuit. If an agreement cannot be reached or the litigation results in a court order for removal of Line 5 from the Reservation, Enbridge would be unable to continue transportation services on the existing Line 5 pipeline. This would affect crude oil, NGLs, and propane markets in Wisconsin, Michigan, Ohio, Ontario, Pennsylvania, and Montreal. Customers that currently ship products through Enbridge's Line 5 pipeline system would have to seek other transportation means that are potentially less safe and more costly than the proposed pipeline. As propane is primarily used for heating, this alternative could result in a regional disruption of propane availability for heating and industrial use in Michigan and the Great Lakes states. That disruption would potentially require replacement of this capacity by some means, such as the alternatives discussed in sections 3.1.2 and 3.1.3, below.

This Project is the most efficient and cost-effective means to continue delivering the necessary products to existing customers. Although the No-Action Alternative would avoid direct environmental impacts because Enbridge would not implement the Project, the No-Action Alternative does not meet the purpose and need of the Project, and would trigger potentially significant impacts for replacement of propane for industrial and heating applications.

3.1.2 System Alternatives

The purpose of identifying and evaluating system alternatives is to determine whether using another system would avoid or reduce potential environmental impacts while still meeting the purpose and need of the proposed Project. System alternatives are those that would make use of other existing, modified, or proposed pipeline systems (or non-pipeline systems) to meet the purpose and need of the proposed Project. A system alternative would make it unnecessary to construct all or part of the proposed Project, although it may require some modifications or additions to other existing pipeline systems to increase their capacity.

These modifications or additions may result in environmental impacts that are less than, similar to, or greater than those associated with construction of the proposed Project.

The following analysis examines existing and proposed crude oil pipeline systems that currently serve the markets the proposed Project already serves. The analysis considers whether those systems would meet the proposed Project purpose and needs while offering an environmental advantage.

3.1.2.1 Pipeline System Alternatives

There is currently no pipeline system that services the same product delivery and receipt points that Enbridge's Line 5 system services and/or existing pipeline systems designed to accommodate both crude oil and NGL products. To fulfill the same purpose as Enbridge's existing Line 5 system, including deliveries to Rapid River, MI and receipts at Lewiston, MI, a new pipeline and/or multiple pipelines would be required.

Any new pipeline system would require an entirely new right-of-way as well as new pump stations, power supplies, valve sites, and potential access roads that would likely be equal to or greater in impact than replacing a segment of the existing Line 5 pipeline. These pipelines would either need to interconnect to Enbridge's system at Enbridge's Superior Terminal located in Superior, Wisconsin to receive and transport products being delivered into Superior on other Enbridge pipelines, or would need to transport crude oil and NGL from other markets within the United States. A new pipeline would result in its own set of specific environmental impacts that would likely be greater than those described for this Project. Additionally, a new pipeline system would likely impact more landowners than the proposed Project and be significantly more expensive to construct.

Enbridge has determined that rerouting a segment of the pipeline around the Reservation in place of building an entirely new pipeline is the most effective means to continue delivering the products to its customers. It would also produce the least impact to the environment and surrounding communities. Therefore, the option of using existing infrastructure was removed from further analysis.

3.1.3 Alternative Transport Modes

As an alternative to the proposed Project, Enbridge assessed the feasibility of utilizing rail and truck for the movement of crude oil and NGLs in the quantities that are currently transported on Line 5. Line 5 capacity is 540,000 bpd, with approximately 90,000 bpd of that volume consisting of NGLs, and the other 450,000 bpd consisting of light crude oil. Line 5 receives products at Superior and Lewiston MI, and delivers products to Rapid River, MI, Marysville, MI, and Sarnia. A feasible transportation option must provide the ability to transport and receive products in Superior, WI, the Upper and Lower Peninsulas of Michigan, and across the U.S.–Canada international boundary to Sarnia. To be feasible, such transportation alternatives must: (i) transport 540,000 bpd of product daily on a reliable basis; (ii) for a cost that is comparable to existing transportation costs on Line 5; (iii) require less capital investment than the proposed Project; and (iv) not result in a significant increase in adverse environmental impacts. As discussed below, neither rail nor trucking would provide a feasible alternative.

3.1.3.1 Railroad

As an alternative to rerouting the portion of the Project around the Reservation, Enbridge assessed the potential to transport products and quantities currently shipped through Line 5 by rail.

North American railroads transport crude oil and NGLs in specialized tank cars that hold 658 barrels of crude oil or 802 barrels of NGLs. Approximately 669 rail tank cars would be required on a daily basis to

transport the Line 5 daily crude volume of 450,000 bpd, and approximately 112 rail tank cars would be required on a daily basis to transport the Line 5 daily NGL volume of 90,000 bpd. In order to allow for the continuous daily transport of Line 5 volumes, a total of 3,092 rail tank cars would be necessary.

Currently, there are no existing railroad systems that directly connect Enbridge's Superior Terminal to delivery points, such as the Plains Midstream Depropanization Facility in Rapid River, Michigan or receipt points, such as the facility in Lewiston, Michigan. Additional rail lines and siding facilities would be required at each location. Construction of new lateral rail service lines would be required and would pose additional risk and impact to landowners and the public. This alternative would also require the construction (by Enbridge or its shippers) of rail car loading and off-loading facilities near Enbridge's Superior Terminal and at other receipt/delivery locations along the Line 5 pipeline system.

Rail service would result in the burning of fossil fuels and would increase emissions associated with the transfer of product into and from the rail cars. This alternative also would be subject to delays caused by scheduling conflicting rail traffic, and would have a significant mechanical/maintenance requirement. This option would also require routing rail through or around the City of Chicago, with its highly scheduled rail lines and high population density, an area prone to rail shipping delays.

While rail tanker cars are a vital part of the short-haul distribution network for crude oil, pipelines are a safer and more economic transportation alternative for long-haul distribution networks (Strata 2017). The estimated cost of shipping the volume of crude oil transported by rail cars in lieu of pipeline (incorporating operation and maintenance costs along with fuel costs) would be in the range of hundreds of millions of dollars per year, which is significantly greater than the cost of transporting the oil by pipeline.

While technically feasible, Enbridge eliminated the rail option as a viable Project alternative due to the environmental impacts, safety and environmental risks, logistical requirements, and high cost of transport by rail.

3.1.3.2 Trucking

As an alternative to relocating the segment of pipeline that traverses through the Reservation, Enbridge could potentially transport crude oil by tanker truck.

North American tank trucks designed to transport hazardous liquids have the capacity to transport 172 barrels of crude oil or 218 barrels of NGLs. To achieve the continuous daily (24-hour) transport of Line 5 volumes, a total of 3,000 loaded tanker trucks and an additional 3,000 empty tanker trucks would be required to travel on highways and roads in Wisconsin, Michigan, Illinois, Indiana, and Canada. A private or dedicated fleet would need to be acquired to provide the necessary quantity of tanker trucks, assuming that the number of trucks and the needed drivers were available at all, which is problematic. In Wisconsin, the trucks would primarily use U.S. Highway 2, which traverses the Bad River Reservation, or would travel down the Highway 53 to U.S. Highway 94, which already carry a substantial volume of commercial traffic. The additional truck traffic and associated loads on Wisconsin roads would result in an increased need for road repair and/or expansion. The traffic would also require routing shipments over the Straits of Mackinac or, as with rail, through or around the City of Chicago. Furthermore, additional truck traffic would result in the burning of fossil fuels through the trucks' combustion engines. In addition, periodic restrictions on truck traffic due to winter storms, spring road restrictions, and other weather conditions would compromise the reliability of this alternative in a northern climate. The safety risk magnifies from the impact created by increased truck traffic on Wisconsin highway routes. A trucking alternative may also overburden current public road capacity. Data from other states impacted by development in the Bakken Formation suggest

that the use of trucking negatively impacts communities and roadways, and that additional pipeline infrastructure would alleviate transportation concerns (North Dakota Office of the Governor 2012).

Similar to the rail transport option, Enbridge or its shippers would need to construct truck loading/unloading facilities at suitable locations near the Superior Terminal and other receipt/delivery points along Line 5. The estimated cost of trucking the volume of crude oil transported by truck in lieu of pipeline (incorporating operation and maintenance costs along with fuel costs) would be in the range of hundreds of millions of dollars per year, which is significantly greater than the cost of transporting the oil by pipeline.

While technically feasible, Enbridge eliminated the trucking alternative as a viable Project alternative due to the safety and environmental risks, logistical demands, and high cost.

3.1.4 Route Alternatives

This information is intended to inform the WDNR and general public about the routing constraints and the human and environmental features that Enbridge considers when planning its route, and it reflects Enbridge's experience routing and operating pipelines in North America and Wisconsin over the past 65 years. Environmental resources, landowner discussions, and constructability constraints are all features considered in Enbridge's routing process for the Project, and Enbridge believes the Preferred Route provides the best balance between numerous criteria and minimizes the overall impacts associated with the Project.

Enbridge's route alternatives analysis focused on minimizing the length of the pipeline to the extent practicable, while also minimizing the environmental impacts to specific resources. For context, each mile of the Project will generally affect approximately 15 acres during construction (exact acreage is dependent on construction methods, workspaces, access roads, etc.). It is not practicable to avoid all resources due to the linear nature of a pipeline project and the extent, shape, and prevalence of many resources.

The location of the Bad River Reservation influenced consideration of potential alternative corridors. Enbridge reviewed potential routes that would avoid the Reservation, taking into account potential tie-in locations for the replacement segment, and lessen the length of the pipeline segment while minimizing impacts on environmental resources. Three Route Alternatives were identified (see Figure 3.1.4-1).

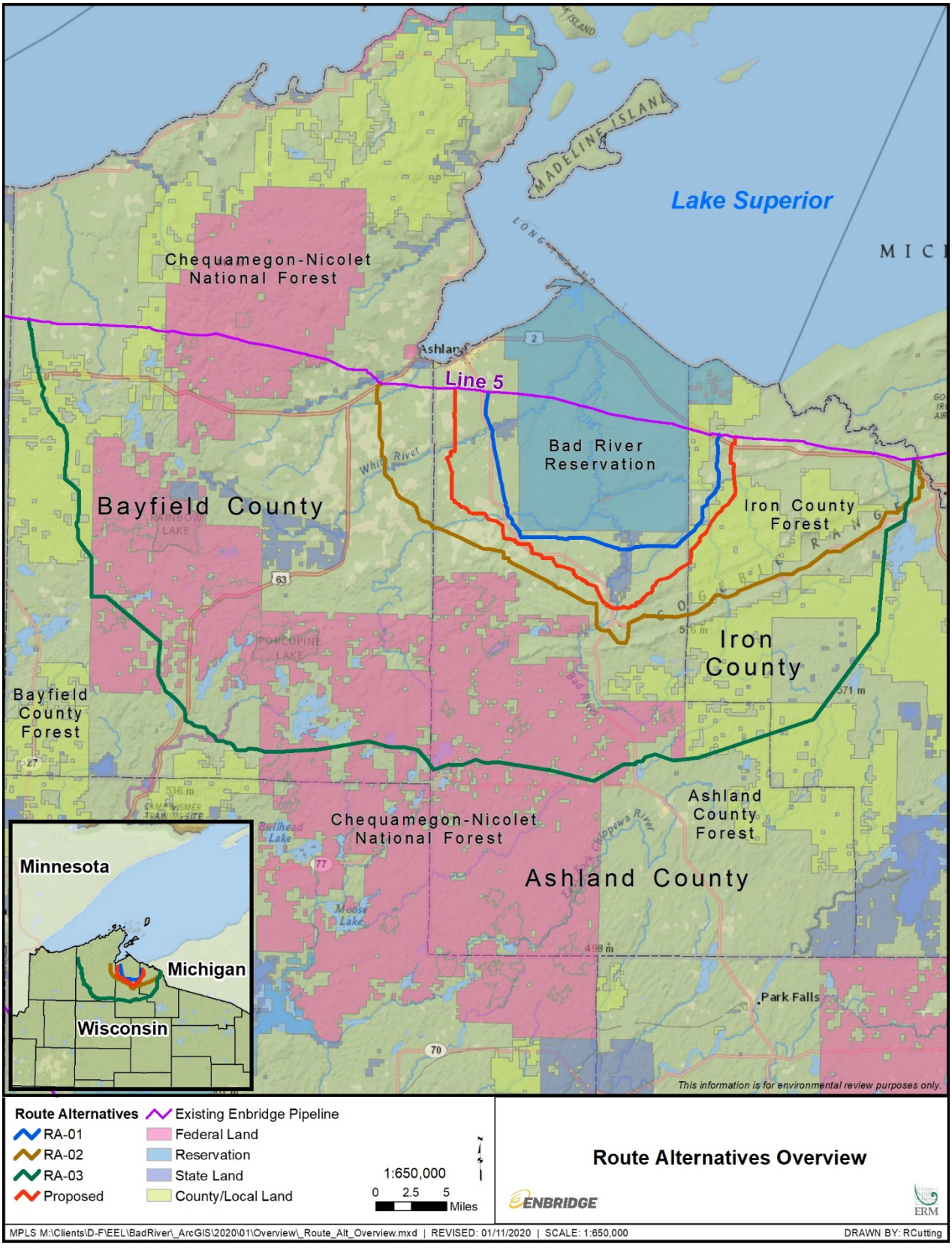

Figure 3.1.4-1: Overview of Route Alternatives

Enbridge conducted a detailed quantitative analysis of environmental impacts for each of the route alternatives in accordance with Wisconsin Administrative Code §NR 103.07(2). The remaining factors have been considered as part of the overall environmental review required for the Project per Wisconsin Administrative Code §NR 150. Results of the analysis are presented in Table 3.1.4-1. The analysis uses sources of publicly available environmental data to compare a variety of factors, including:

- Wetlands;
- Forested areas;
- Highly wind erodible soils;
- Agricultural land;
- Perennial waterbodies;
- State, County, or Municipal Forest;
- Sensitive species;
- Area of Special Natural Resource Interest; and
- Roads and railroads crossed.

Sections 3.1.4.1 through 3.1.4.3 provide an overview of each alternative and Attachment C (filed on February 11, 2020) provides maps of each route alternative.

3.1.4.1 Route Alternative RA-01

Enbridge identified route alternative ("RA-01") to minimize the overall pipeline length. Route Alternative RA-01 would be located outside of, but near to the exterior boundary of the Reservation and is the shortest identified route that would avoid the Reservation. A comparison of environmental resources potentially impacted by RA-01 and the proposed route is presented in Table 3.1.4-1.

As shown in Table 3.1.4-1, RA-01 is approximately 29.3 miles in length, or approximately 11.8 miles shorter than the proposed route. Due to its shorter length, RA-01 would cost approximately $95.8 million less to construct than the proposed route. Based on a standard construction right-of-way width of 120 feet, RA-01 has the potential to impact approximately 141 fewer acres during construction, cross 16 fewer waterbodies (based on WDNR 24k Hydrography Dataset information), and cross approximately 73 fewer acres of Federal, State, or County owned land than the proposed route. However, RA-01 has the potential to have increased wetland impacts, cross more emergent/wet meadow classified wetlands, deciduous forest, prime and statewide importance farmland soils, and cross additional roadways.

Additionally, RA-01 would cross approximately 0.5 mile of the Copper Falls State Park. Portions of the park, including Copper Falls (a section of the Bad River) have been designated as an Area of Special Natural Resource Interest ("ASNRI") and a State Natural Area ("SNA"). ASNRI include designated state natural areas, designated trout streams, waters or portions of waters inhabited by any endangered, threatened, special concern species or unique ecological communities identified in the Natural Heritage Inventory, wild rice waters, federal or state waters designated as wild or scenic rivers, waters in ecologically significant coastal wetlands along Lakes Michigan and Superior as identified in the Coastal Wetlands of Wisconsin, waters in areas identified in a special area management plan or special wetland inventory study. SNAs protect outstanding examples of Wisconsin's native landscape of natural communities, significant geological formations, and archeological sites (WDNR 2019). Additionally, RA-01 would potentially cross through a portion of the Copper Falls State Park that is listed on the National Register of Historic Places and Wisconsin State Register (NRHP # 05001425).

Although RA-01 would be technically feasible and less expensive to construct, and meet the Project objective, Enbridge determined that RA-01 would not convey a significant environmental advantage over

the proposed route and would introduce additional environmental impacts to state owned lands that the proposed route would avoid. Based on this environmental analysis, including the introduction of resource impacts on state owned lands that the proposed route would avoid, Enbridge rejected this alternative for the Project.

3.1.4.2 Route Alternative RA-02

Enbridge identified a second route alternative ("RA-02") located farther from the Reservation boundary and that avoids Copper Falls State Park. A comparison of environmental resources potentially impacted by RA-02 and the proposed route is presented in Table 3.1.4-1.

As shown in Table 3.1.4-1, RA-02 is approximately 58 miles in length, or approximately 16.5 miles longer than the proposed route. RA-02 would cost approximately $134 million more to construct due to its longer length. Based on a standard construction right-of-way width of 120 feet, RA-02 has the potential to impact approximately 246 additional acres for construction, require clearing approximately 202 additional acres of forest, cross 16 additional waterbodies, including trout streams and WDNR priority navigable waterway crossings (based on WDNR 24k Hydrography Dataset information), and disturb approximately 8.7 additional Wisconsin Wetland Inventory ("WWI") mapped wetlands.

RA-02 would potentially affect more than three times the state listed species occurrences as the proposed route, despite being only approximately 30 percent longer, likely due to the proximity to the Chequamegon Nicolet National Forest. In addition, RA-02 would have more impacts on forested habitats (including forested wetlands) which take a longer time to recover after construction.

RA-02 has the potential to cross approximately 86 fewer acres of Federal, State, or County owned land than the proposed route, fewer Migratory Bird Concentration Areas, and fewer acres of highly wind erodible soils and agricultural land.

Although RA-02 would be technically feasible to construct and meet the project objective, Enbridge determined that RA-02 did not convey a significant environmental advantage over the proposed route. Based on this environmental analysis, as well as additional costs to construct Enbridge rejected this alternative for the Project.

3.1.4.3 Route Alternative RA-03

In response to the Bad River Band's lawsuit that requests Enbridge remove the existing Line 5 from not only the Reservation, but the watershed identified by the Bad River Band, Enbridge also evaluated a route alternative ("RA-03") that would be located outside the WDNR-designated sub-watersheds having surface flow connectivity into the Reservation. A comparison of environmental resources potentially impacted by RA-03 and the proposed route is presented in Table 3.1.4-1.

As shown in Table 3.1.4-1, potential environmental impacts associated with RA-03 are generally much greater than the proposed route. RA-03 is approximately 100 miles in length, or approximately 59 miles longer than the proposed route. RA-03 would cost approximately $479.1 million more to construct due to its longer length. Based on a standard construction right-of-way width of 120 feet, RA-03 has the potential to impact approximately 879 additional acres for construction, including approximately 330 acres of additional coniferous forest clearing and approximately 359 acres of additional deciduous forest clearing. RA-03 would disturb approximately 230 additional acres of WWI-mapped wetlands, of which approximately 207 acres are forested wetland. The route would also disturb approximately 768 additional acres of Federal, State, or County-owned public land, including crossing potentially 28 miles of new, greenfield crossing of the Chequamegon-Nicolet National Forest. RA-03 has the potential to cross the

Island Lake Hemlocks Area of Special Natural Resource Interest and the Namekagon River, which is a Wild and Scenic River.

While RA-03 has the potential to cross 11 fewer waterbodies (based on WDNR 24k Hydrography Dataset information), there would likely be a significant increase in impacts on wetlands, forested habitats, sensitive species, perennial waterbody crossings, designated trout streams, and road crossings as compared to the proposed route, causing an overall greater environmental impact from the Project.

Due to the additional pipe length, RA-03 would also require the construction of an additional pump station and associated appurtenances, and decommissioning of the Ino pump station. While pump stations themselves are not significant sources of air emissions, the electricity required to run the pump station contributes to an increase in indirect air emissions that would not be realized with the proposed route.

Although RA-03 would be technically feasible to construct and meet the project objective, Enbridge determined that RA-03 did not convey a significant environmental advantage over the proposed route. Based on this environmental analysis, as well as the potential for RA-03 to significantly increase natural resources impacts, including greater forested habitats (both upland and wetland), and constructability and operational costs, Enbridge rejected RA-03 for the Project.

Table 3.1.4-1: Environmental Features Comparison—Route Alternatives

Environmental Features	Unit	Proposed Route Length [a]: 41.1 miles Route Corridor [b]: 597.8 acres	Route Alternative RA-01	Route Alternative RA-02	Route Alternative RA-03
			Route Length [a]: 29.3 miles Route Corridor [b]: 456.5 acres	Route Length [a]: 57.6 miles Route Corridor [b]: 843.6 acres	Route Length [a]: 100.5 miles Route Corridor [b]: 1,476.9 acres
Wetland Crossing Length—WWI	miles	4.2	5.3	6.5	26.2
Wetland Crossed—NWI					
PEM	acres	2.0	1.7	1.1	7.7
PSS	acres	2.0	2.1	9.9	50.6
PFO	acres	26.1	22.3	40.2	304.5
Wetland Crossed—WWI					
emergent/wet meadow	acres	2.7	7.8	8.7	7.0
scrub/shrub	acres	2.7	2.0	2.0	21.7
forested	acres	54.0	46.4	57.4	260.8
State-Listed Species Occurrences [c]	number	27	14	87	85
Migratory Bird Concentration Areas	number	1	1	0	0
Agricultural Land [d]	acres	83.8	29.8	55.1	2.4
Coniferous Forest [d]	acres	57.5	56.5	69.0	387.4
Broad-leaved Deciduous Forest [d]	acres	297.2	222.8	488.2	655.7
Prime and Statewide Importance Farmland Soils	miles	11.5	13.9	15.1	16.6
Hydric Soils	miles	2.2	1.6	5.0	25.4
Highly Wind Erodible Soils	miles	7.4	4.3	2.7	28.5
Intermittent / Fluctuating Waterbody Crossings—WDH	number	40	29	38	9
Perennial Waterbody Crossings—WDH	number	18	13	36	38
Designated Trout Stream Crossings	number	15	12	20	25

Environmental Features	Unit	Proposed Route Length [a]: 41.1 miles Route Corridor [b]: 597.8 acres	Route Alternative RA-01 Route Length [a]: 29.3 miles Route Corridor [b]: 456.5 acres	Route Alternative RA-02 Route Length [a]: 57.6 miles Route Corridor [b]: 843.6 acres	Route Alternative RA-03 Route Length [a]: 100.5 miles Route Corridor [b]: 1,476.9 acres
WDNR Priority Navigable Waterways Crossings	number	15	15	21	17
Wild and Scenic Rivers	number	0	0	0	1
Wild Rice Production Areas	number	0	0	0	0
Areas of Special Natural Resource Interest Crossings (WDNR owned)	number	0	1	0	1
Federal, County, and State-Owned Lands	acres	107.5	34.7	21.3	875.7
WDNR-Owned Lands	miles	0	0.7	0	0.1
County Forest Land	miles	7.4	<0.1	0	4.1
Railroad Crossings	number	4	2	1	1
Road Crossings [e]	number	39	37	50	98

Notes:

[a] Centerline length.

[b] A standard 120 foot corridor was used for each route comparison.

[c] Based on NHI data review, includes state threatened and endangered species.

[d] Wiscland 2 Land Cover Data (WDNR 2019s).

[e] Includes county and local roads, and state and U.S. highways.

NLCD2011 = National Land Cover Database 2011; WDH – Wisconsin 24k Hydrography Dataset; NHI = Natural Heritage Inventory; NWI = National Wetlands Inventory; PEM = Palustrine Emergent; PFO = Palustrine Forested; PSS = Palustrine Scrub-Shrub; WDNR = Wisconsin Department of Natural Resources; WWI = Wisconsin Wetland Inventory

4 ENGINEERING AND CONSTRUCTION PRACTICES

4.1 PHYSICAL PIPELINE CHARACTERISTICS

Enbridge would construct the Project using modern pipeline design, manufacturing, coating, and installation techniques. As a crude oil and NGL pipeline, the Project's design, construction, maintenance, and operation functions are regulated by PHMSA under 49 CFR Part 195, which governs transportation of hazardous liquids by pipeline. The design of the pipeline system would also comply with the industry standards (e.g., American Society of Mechanical Engineers/American National Standards Institute Code B31.4, American Petroleum Institute ("API") 570, API RP 1102, among others). Additionally, major oil pipelines must comply with other pertinent industry standards. Table 4.1-1 provides pipeline design information pertinent to the Project.

Table 4.1-1: Project Pipe Specifications

Use Type	General Use	Road/Railroad Bores/Valve Assembly	HDD and Direct Bore	HDD/Railroad Crossings
Wall Thickness	0.500 inch;	0.500 inch	0.625 inch	0.750 inch
Length	30.3 miles	4.9 mile	2.8 miles	3.3 miles
Coating	Fusion Bond Epoxy [a]			
Pipe Industry Specification	API 5L PSL2			
Pipe Grade	X70			
Pipe Design Factor	0.72			
Longitudinal Seam Factor	1.0			
Class Location & Requirements	N/A (applies to natural gas pipelines)			
Specified Minimum Yield Strength	70,000 psi			
Tensile Strength	82,000 psi			

Notes:
[a] Fusion Bond Epoxy will be used everywhere. Pipe installed by HDD or any type of bore will also have an Abrasion Resistant Overlay.
"API" = American Petroleum Institute; "HDD" = horizontal directional drilling; "N/A" = not applicable; "psi" = pounds per square inch

4.2 LAND REQUIREMENTS

4.2.1 Construction Right-of-Way

Enbridge generally proposes to use a 120-foot-wide construction right-of-way for the new 30-inch outside diameter pipeline segment, which will allow for temporary storage of topsoil and spoil as well as accommodate safe operation of construction equipment. To minimize wetland disturbance, Enbridge proposes to reduce the construction right-of-way to 95-feet-wide in wetlands, where practicable based on site-specific conditions. The construction corridor includes permanently maintained rights-of-way and temporary workspaces. The construction right-of-way consists of the spoil side (area used to store topsoil and excavated materials) and the working side (equipment work area and travel lane) (see Figures 4.2.2-1 and 4.2.2-2).

As described in the Environmental Protection Plan filed on February 11, 2020, Enbridge will maintain a 50-foot-wide operational right-of-way that is cleared of vegetation to facilitate access and aerial inspections. Enbridge proposes to reduce the maintained portion of the operational right-of-way from 50 feet to 30 feet between the proposed horizontal directional drill ("HDD") crossings and the direct bore crossings. The operational right-of-way will be cleared as part of construction and maintained for operations as herbaceous vegetation. In addition, where waterbodies and wetlands occur between the HDD entry and exit points, they will be bridged or matted, respectively, to allow clearing equipment to travel along the right-of-way. However, mainline construction equipment will be rerouted around the HDD locations, with the exception of Tyler Forks which will be bridged.

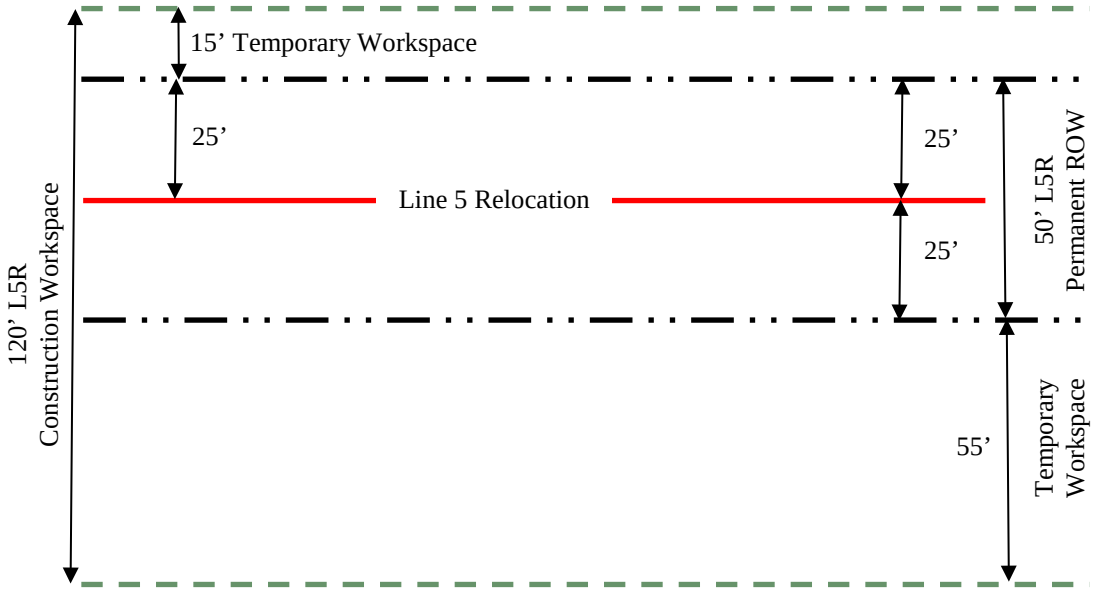

Figure 4.2.2-1: Typical Construction Workspace—Uplands

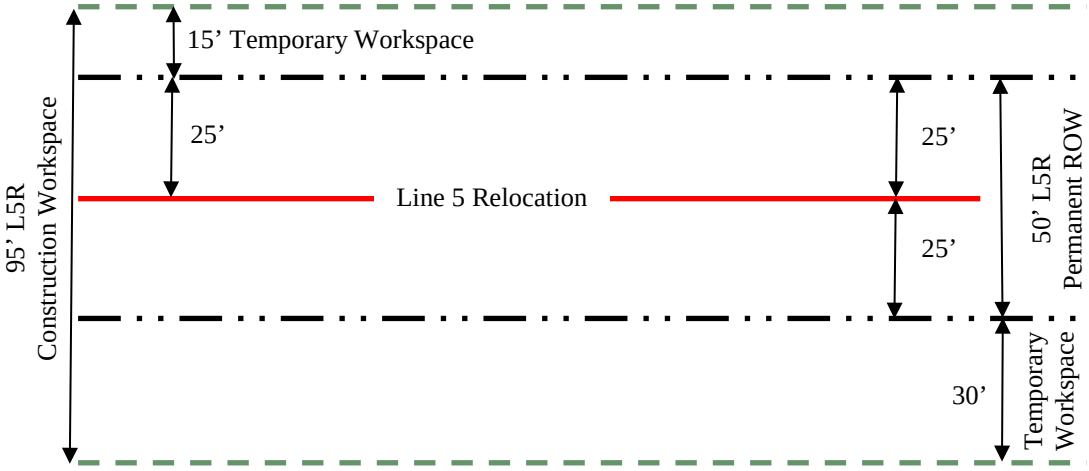

Figure 4.2.2-2: Typical Construction Workspace—Wetlands

4.2.2 Additional Temporary Workspace Areas

Additional temporary workspace ("ATWS") areas are generally necessary where the proposed route crosses features such as waterbodies, wetlands, roads, railroads, and existing pipelines and utilities. These ATWS areas are construction areas that are temporarily necessary outside the typical construction right-of-way to stage equipment, stockpile spoil material, and conduct material fabrication and assembly. In some cases, due to site-specific conditions, ATWS may be within wetland boundaries (refer to Enbridge's Environmental Protection Plan ["EPP"], Attachment D filed on February 11, 2020). Table 4.2.2-1 below provides the typical dimensions used for ATWS.

Table 4.2.2-1: Typical Dimensions of Additional Temporary Workspaces

Feature	Dimensions on Each Side of Feature [a]
Open-Cut Road Crossings	150 feet by 50 feet
Bored Road and Railroad Crossings	150 feet by 50 feet
Foreign Pipeline and Utility Crossings	150 feet by 50 feet
Horizontal Directional Drill	200 feet by 100 feet
Waterbody Crossings	150 feet by 50 feet
Wetland Crossings	150 feet by 50 feet

Notes:
[a] Areas are in addition to the typical 120-foot-wide construction right-of-way.

4.2.3 Access Roads

Enbridge typically uses existing public and private roads to access the right-of-way and facilities to the extent practicable to limit impacts attributed to construction of new temporary roads. However, Enbridge identified areas where new temporary access roads will be necessary for equipment, material deliveries, and personnel access. In these areas, Enbridge will obtain applicable landowner and regulatory approvals prior to using the new access road. Table 4.2.3-1 includes a list of currently proposed access roads. Access roads will total approximately 32 miles, with approximately 15 miles in Ashland County, 16 miles in Iron County, and less than 1 mile each in Douglas and Bayfield Counties.

Table 4.2.3-1: Proposed Access Roads

Access Road ID	County (ies)	Approximate Milepost (Intersects with Pipelines)	Length (miles)	Temporary/ Permanent	Public/ Private Road	Improvements
001	Ashland	0.0	0.15	Temporary	Private	Existing, Improvements needed
003.01	Ashland	2.7	0.32	Temporary	Private	Existing, Improvements needed
13	Ashland	6.0	0.08	Temporary	Private	Existing, Improvements needed
014	Ashland	6.9	0.41	Temporary	Private	Existing, Improvements needed
015	Ashland	7.7	0.15	Temporary	Private	Existing, Improvements needed
016	Ashland	8.1	0.09	Temporary	Private	Existing, Improvements needed
017	Ashland	8.6	0.07	Temporary	Private	Existing, Improvements needed
018	Ashland	8.8	0.12	Temporary	Private	Existing Approach, Improvements needed
019	Ashland	9.3	0.06	Temporary	Private	Existing Approach, Improvements needed
020	Ashland	10.3	0.15	Temporary	Private	Existing Improvements needed
021	Ashland	11.1	0.48	Temporary	Private	Existing, Improvements needed

Access Road ID	County (ies)	Approximate Milepost (Intersects with Pipelines)	Length (miles)	Temporary/ Permanent	Public/ Private Road	Improvements
022	Ashland	11.4	0.16	Temporary	Private	Existing Approach, Improvements needed
024	Ashland	12.9	0.22	Temporary	Private	Existing Approach, Improvements needed
025	Ashland	13.5	0.14	Temporary	Private	Existing, Improvements needed
026	Ashland	14.0	0.11	Temporary	Private	Existing, Improvements needed
026.01	Ashland	14.1	0.14	Temporary	Private	Existing, Improvements needed
027	Ashland	14.5	0.03	Temporary	Private	Existing, No Improvements needed
028	Ashland	14.7	0.07	Temporary	Private	Existing Approach, Improvements needed
028.1	Ashland	15.0	0.12	Temporary	Private	Existing Approach, Improvements needed
029	Ashland	16.0	0.10	Temporary	Private	Existing, No Improvements needed
030	Ashland	16.7	0.08	Temporary	Private	Existing, Improvements needed
031	Ashland	17.1	0.02	Temporary	Private	Existing, Improvements needed
031.01	Ashland	17.1	0.03	Temporary	Private	Existing, Improvements needed
034	Ashland	18.7	0.16	Temporary	Private	Existing, Improvements needed
039	Ashland	20.5	1.21	Temporary	Private	Existing, Improvements needed
040.01	Ashland	19.6	0.22	Temporary	Private	Existing, Improvements needed
040.02	Ashland	19.5	0.20	Temporary	Private	Existing, Improvements needed
042	Ashland	20.0	0.76	Temporary	Private	Existing, Improvements needed
043	Ashland	20.5	0.18	Temporary	Private	Existing, Improvements needed
044	Ashland	20.7	0.02	Temporary	Private	Existing, Improvements needed
045	Ashland	20.7	0.52	Temporary	Private	Existing, Improvements needed
046	Ashland	21.4	0.16	Temporary	Private	Existing, Improvements needed
047	Ashland	21.8	0.20	Temporary	Private	Existing, Improvements needed
048	Ashland	22.1	0.18	Temporary	Private	Existing, Improvements needed
049	Ashland	22.6	0.24	Temporary	Private	Existing, Improvements needed
050	Ashland	22.9	0.11	Temporary	Private	Existing, Improvements needed
050.01	Ashland	23.2	0.11	Temporary	Private	Existing, Improvements needed
050.02	Ashland	23.6	0.21	Temporary	Both	Existing, Improvements needed
050.03	Ashland	23.8	0.10	Temporary	Private	Existing, Improvements needed
051.01	Ashland	23.9	0.08	Temporary	Both	Existing, Improvements needed
052	Ashland	24.1	0.06	Temporary	Private	Existing, Improvements needed
053	Ashland	24.1	0.12	Temporary	Private	Existing, Improvements needed
054	Ashland	24.2	0.11	Temporary	Private	Existing, Improvements needed
055	Ashland	24.4	0.07	Temporary	Private	Existing, Improvements needed
058	Ashland	25.0	0.08	Temporary	Private	Existing, Improvements needed
060	Ashland	25.7	0.32	Temporary	Private	Existing, Improvements needed
061	Ashland	26.0	0.20	Temporary	Private	Existing, Improvements needed
062	Ashland	26.0	0.13	Temporary	Private	Existing, Improvements needed
063	Ashland	27.2	0.31	Temporary	Private	Existing, Improvements needed
064	Ashland	27.7	0.01	Temporary	Private	Existing, Improvements needed
065	Ashland	28.00	0.06	Temporary	Private	Existing Approach, Improvements needed
066	Ashland	28.1	0.03	Temporary	Private	Existing, Improvements needed
067	Ashland	28.3	0.10	Temporary	Private	Existing, Improvements needed
068	Ashland	28.6	0.30	Temporary	Private	Existing, Improvements needed

Access Road ID	County (ies)	Approximate Milepost (Intersects with Pipelines)	Length (miles)	Temporary/ Permanent	Public/ Private Road	Improvements
069	Ashland	28.9	0.35	Temporary	Private	Existing, Improvements needed
070	Ashland	29.5	0.32	Temporary	Private	Existing, Improvements needed
071	Ashland	30.0	0.49	Temporary	Private	Existing, Improvements needed
072	Ashland	30.1	0.47	Temporary	Private	Existing, Improvements needed
073	Iron	30.9	0.12	Temporary	Public	Existing, Improvements needed
074	Iron	30.9	1.89	Temporary	Public	Existing, Improvements needed
075	Iron	32.1	0.28	Temporary	Public	Existing, Improvements needed
076	Ashland, Iron	32.4	1.58	Temporary	Both	Existing, Improvements needed
077	Iron	32.7	0.41	Temporary	Public	Existing, Improvements needed
078	Iron	32.5	0.32	Temporary	Public	Existing, Improvements needed
079	Ashland, Iron	32.7	1.17	Temporary	Both	Existing, Improvements needed
080	Iron	33.0	1.00	Temporary	Public	Existing, Improvements needed
081	Iron	33.0	0.14	Temporary	Public	Existing, Improvements needed
082	Ashland, Iron	33.2	2.39	Temporary	Both	Existing, Improvements needed
083	Iron	33.9	0.95	Temporary	Public	Existing, Improvements needed
084	Iron	34.3	1.27	Temporary	Both	Existing, Improvements needed
085	Iron	33.4	0.21	Temporary	Both	Existing, Improvements needed
087	Iron	36.3	1.12	Temporary	Public	Existing, Improvements needed
088	Iron	36.6	0.23	Temporary	Public	Existing, Improvements needed
089	Iron	36.9	1.60	Temporary	Both	Existing, Improvements needed
090	Iron	37.2	0.60	Temporary	Public	Existing, Improvements needed
091	Iron	37.1	0.09	Temporary	Public	Existing, Improvements needed
092	Iron	37.6	1.47	Temporary	Both	Existing, Improvements needed
094	Iron	38.0	0.01	Temporary	Both	Existing, Improvements needed
095	Iron	38.8	0.24	Temporary	Private	Existing, Improvements needed
098	Iron	39.3	0.43	Temporary	Private	Existing, Improvements needed
099	Iron	39.8	0.26	Temporary	Private	Existing, Improvements needed
101	Iron	40.3	0.10	Temporary	Private	Existing, Improvements needed
102	Iron	40.8	0.02	Temporary	Private	Existing, Improvements needed
103	Iron	40.8	0.14	Temporary	Private	Existing, Improvements needed
104	Iron	41.0	0.25	Temporary	Private	Existing, Improvements needed
202	Ashland	5.0	0.38	Temporary	Private	Existing, Improvements needed
203.01	Ashland	4.8	0.33	Temporary	Private	New, Improvements needed
204	Ashland	4.9	0.09	Temporary	Private	Existing, Improvements needed
Bayside 1	Ashland	N/A	0.17	Temporary	Private	Existing, No Improvements
Bayside 2	Ashland	N/A	0.02	Temporary	Private	Existing, No Improvements
MLV 1	Bayfield	0.0	0.28	Permanent	Both	Existing and new, Improvements needed
MLV 2	Bayfield	0.0	0.13	Permanent	Both	Existing and new, Improvements needed
MLV 3	Ashland	5.6	0.11	Permanent	Both	Existing and new, Improvements needed
MLV 4	Ashland	9.3	0.03	Permanent	Both	New, Improvements needed

Access Road ID	County (ies)	Approximate Milepost (Intersects with Pipelines)	Length (miles)	Temporary/ Permanent	Public/ Private Road	Improvements
MLV 5	Ashland	16.1	0.10	Permanent	Both	New, Improvements needed
MLV 6	Iron	40.0	0.39	Permanent	Private	Existing, Improvements needed
MLV 7	Iron	41.1	0.03	Permanent	Private	New, Improvements needed
South Range 1 Yard	Douglas	N/A	0.02	Temporary	Private	Existing, No Improvements
South Range 2 Yard	Douglas	N/A	0.32	Temporary	Private	Existing, No Improvements
South Range 3 Yard	Douglas	N/A	0.18	Temporary	Private	Existing, No Improvements

MLV = mainline block valve; N/A = not applicable

Enbridge may leave newly constructed temporary roads and existing private roads upgraded for use by the Project intact through mutual agreement with the landowner unless otherwise restricted by federal, state, or local regulations. Where temporary access roads are removed, the area will be restored as near as practicable to the original conditions and seeded and stabilized pursuant to the Project's EPP (refer to Attachment D filed on February 11, 2020). Enbridge's EPP outlines construction-related environmental policies, procedures, and protection measures Enbridge developed as a baseline for construction. Enbridge developed this EPP based on its experience implementing Best Management Practices ("BMPs") during construction, as well as the Federal Energy Regulatory Commission's Upland Erosion Control, Revegetation, and Maintenance Plan (May 2013 Version) and Wetland and Waterbody Construction and Mitigation Procedures (May 2013 Version). It is intended to meet or exceeds federal, state, and local environmental protection and erosion control requirements, specifications, and practices. The EPP addresses typical circumstances that may occur along the Project. Project-specific permit conditions and/or landowner agreements may supersede the general practices described in the EPP.

Enbridge will coordinate the use of private roads with the landowners and the use of public roads with the appropriate county or state road authority. Refer to section 2.2 for a discussion on permits required for land disturbance and stormwater runoff.

4.2.4 Pipe Storage and Contractor Yards

During construction, Enbridge will temporarily use off-right-of-way areas for pipe and materials storage. In addition, construction contractors will require off-right-of-way contractor yards to park equipment and stage construction activities.

Enbridge has continued to assess the Project needs for offline pipe and material storage yards. Enbridge has revised the locations of the proposed offline yards based on landowner interest in leasing the land, potential resource impacts, and Project-specific needs. The revised locations are presented in updated Attachments A and B of the Supplemental Application Information. The four proposed sites have been previously used for commercial/industrial purposes including sand/gravel extraction and timber storage. One yard is in Douglas County, two yards are in Ashland County, and one yard is in Iron County. Enbridge has assessed sensitive environmental features when planning the placement and use of these pipe yards to minimize potential sensitive resource impacts. The proposed workspace at each yard has been designed to avoid resource impacts to the extent practicable. Enbridge and/or the Contractor will lease the sites and

will restore them upon the completion of the Project unless the landowner and applicable agencies otherwise permit or authorize.

4.2.5 Aboveground Facilities

Enbridge has completed additional Project design analysis, which has modified the number of proposed valves from five to seven. This modification includes the installation of two additional mainline block valves on the existing Enbridge Line 5 pipeline. Enbridge proposes to install two mainline block valves west of the Project and one mainline block valve east of the Project tie-in point to the existing Line 5 pipeline. Proposed mainline block valve locations are shown on the Project route maps (see Attachments A and B of the Supplemental Application Information).

Enbridge has modified the location of several of the mainline block valves included in the February 11, 2020 application to address land availability and landowner preferences for the mainline valve locations. Enbridge has worked with each private landowner at the proposed mainline block valve sites to approve the proposed valve location and to minimize environmental resource impacts. Proposed mainline block valve locations and their proximity to wetlands and waterbodies are shown on the Project route maps (see Attachments A and B of the Supplemental Application Information).

Enbridge proposes to use existing access roads and/or existing public road entrances where practicable to minimize overall land disturbance and permanent resource impacts. Each proposed mainline block valve permanent aboveground facility will be approximately 0.13 acre in size and will include the valve, instrumentation and controls, an electrical service building and grounding, fencing, a permanent access road, and a small graveled parking/turn-around area (see section 4.8.2 for additional information on mainline block valves). Additionally, Enbridge will make minor modifications to the Ino Pump Station at the existing facility. These modifications will include the replacement of the existing drag reducing agent injection system with a new 40-foot by 8-foot drag reducing agent injection system containing a drag reducing agent storage tank, tank mixers, transfer pumps, and associated appurtenances. No other aboveground facilities are required for the Project.

4.2.6 Cathodic Protection and AC Mitigation

Enbridge proposes to install a cathodic protection and AC mitigation system on the new pipeline segment. This cathodic protection system would apply a small electric current to the pipeline, which would induce corrosion of a remote, sacrificial anode and inhibit corrosion of the steel comprising the pipeline. AC mitigation protects the pipeline from potential stray voltage associated with overhead power lines.

4.3 CONSTRUCTION PROCEDURES

Construction of the proposed pipeline will follow industry standard practices and procedures as described below. Construction involves a series of discrete activities typically conducted in a linear sequence. These include survey and staking; clearing and grading; pipe stringing, bending, and welding; trenching; lowering-in and backfilling; hydrostatic testing; final tie-in; commissioning; and right-of-way cleanup and restoration.

Enbridge will employ conventional overland construction techniques where the Project is located in upland areas. In the typical pipeline construction scenario, each construction crew will proceed along the pipeline right-of-way in one continuous operation from staking to backfilling and final grading. The process will be coordinated to minimize the total time an individual tract of land is disturbed to the extent practicable. Figure 4.3-1 provides a schematic depicting the typical pipeline construction sequence. The subsequent sections of this document include descriptions of the typical and specialized construction techniques (e.g.,

waterbody crossings). Also, refer to Enbridge's EPP (Attachment D filed on February 11, 2020) for more detailed construction and restoration information.

Total impacts can be minimized by performing construction in as linear a fashion as possible (each crew moving in sequence/phase as described per comments above) only deviating where necessary (such as to complete HDD segments or difficult terrain such as higher rock concentrations), minimizing the total time to construct and total duration of disturbance. As discussed in detail below, construction involves a series of discrete activities typically conducted in a linear sequence, similar to an assembly line process. Each construction crew proceeds along the pipeline right-of-way in one continuous operation from staking to backfilling and final grading. Specialty crews will be used to install select areas including horizontal directional drills, road crossings, and railroad crossings. Each construction process is coordinated to minimize the total time an individual tract of land is disturbed to the extent practicable. As discussed in Section 15.0 of Enbridge's Environmental Protection Plan (EPP) clean-up will begin within 72 hours after backfilling the trench. Final grading, topsoil replacement, seeding, and installation of permanent erosion controls structures will be completed within 20 days after backfilling the trench. If these timeframes cannot be met based on site conditions (e.g., frozen ground conditions), temporary erosion and sediment controls will be installed and maintained until conditions allow completion of cleanup. Enbridge will install and maintain temporary erosion controls to protect sensitive resource areas until areas have been revegetated. Enbridge will remove temporary bridges and wetland matting as soon as practicable after access for construction in no longer required. This is typically completed as part of the final cleanup phase.

4.3.1 Preparation of the Right-of-Way

Before the start of construction, civil survey crews will stake the pipeline centerline, approved construction workspace limits, and the location of approved access roads. Avoidance areas such as wetland and waterbody boundaries, cultural resource sites, and other environmentally sensitive areas will be marked with appropriate fencing or flagging. The centerline for the pipeline will be marked at designated intervals, at known foreign line crossings, and at points of intersection. Affected landowners will be notified before preconstruction staking is conducted.

4.3.2 Clearing and Grading

The Contractor will clear the right-of-way in accordance with permits and landowner agreements. Clearing will be limited to approved construction work areas including the construction right-of-way, access roads, yards, and staging areas. The Contractor will protect trees to the extent possible and will remove stumps when necessary during grading and pipeline installation. The Contractor will haul stumps and debris created from preparation of the construction area to an approved disposal site, mulch, or otherwise handle in accordance with Project permit requirements. Disposal of non-merchantable timber and slash will occur by mowing, chipping, grinding, and/or hauling off site to a disposal facility or could be used to stabilize erodible slopes or construction entrances. In non-agricultural, non-wetland areas, chips, mulch, or mechanically cut woody debris may be uniformly broadcast across the right-of-way where the material would ultimately be incorporated into the topsoil layer during grading activities, with landowner approval.

Enbridge will not allow the Contractor to burn non-merchantable wood unless they acquire all applicable permits and approvals (e.g., agency and landowner) and do so in accordance with all state and local regulations.

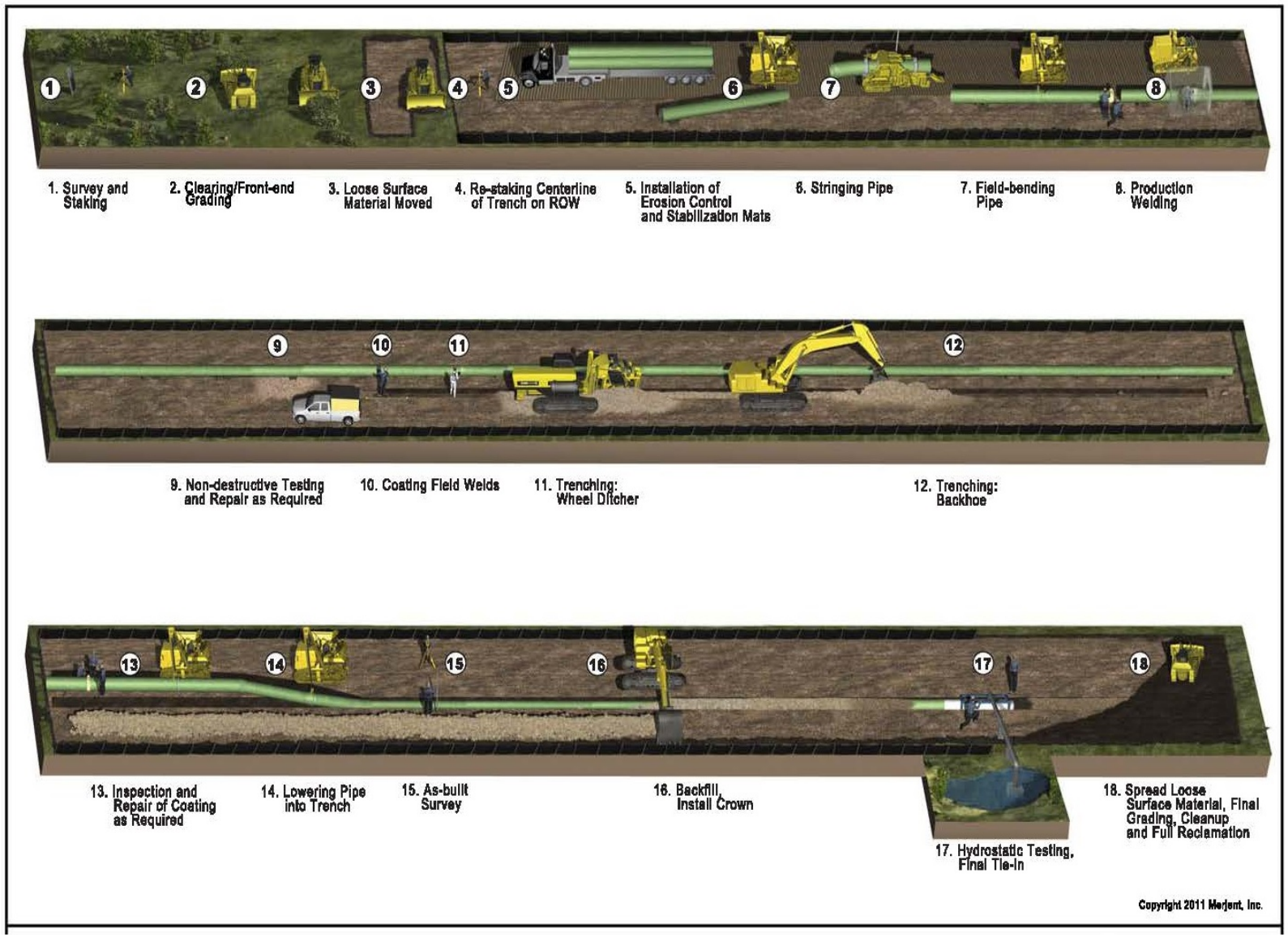

Figure 4.3-1: Typical Pipeline Construction Sequence

The clearing crew and related equipment, as well as equipment necessary for installation of equipment crossings, may require a single pass through streams prior to installation of temporary equipment crossing (bridges) to clear bank vegetation, prepare the site of bridge placement, and install the bridge, unless restricted by federal, state, or local agency requirements. A fence crew, typically operating in conjunction with the clearing crews, will cut and brace fences and install temporary gates along the route in accordance with landowner agreements to control livestock and limit public access. Avoidance areas will be fenced to prevent disturbance from construction activities. An environmental crew will also work in conjunction with the clearing crew to install erosion and sediment control devices following vegetation removal and prior to grubbing and grading activities. These erosion and sediment controls will be inspected and maintained throughout the construction and restoration phases of the project, as appropriate, and as required by the EPP. As discussed in Section 3.0 of the EPP, Enbridge will post signs identifying the boundaries of sensitive resource areas, waterbodies, wetlands, or areas with special requirements. Enbridge will employ a team of Environmental Inspectors during construction who will be working with the construction crews to evaluate site conditions and the installation of resource protection measures, including during clearing activities. The Environmental Inspectors will have the authority to require the installation of erosion control measures prior to clearing where there is a higher risk of potential resource impact due to erosion and sediment discharge as a result of clearing activities.

Following clearing or topsoil removal, the construction work area will be graded where necessary to provide a level work surface to create a safe working area, accommodate pipe-bending equipment, and allow the operation and travel of construction equipment. More extensive grading will be required in steep side slope or vertical areas and where necessary to prevent excessive bending of the pipelines. The Contractor will grade the construction area only to the extent necessary to provide a safe work area and will do so in a manner that minimizes effects on natural drainage and slope stability

Topsoil generally has physical and chemical properties that are conducive to good plant growth. To prevent the mixing of topsoil with less productive subsoil during construction, the Contractor will segregate topsoil in selected areas where soil productivity is an important consideration. The Contractor will maintain a visible separation between the topsoil and subsoil piles to prevent mixing. The Contractor will segregate topsoil in croplands, hay fields, pastures, residential areas, unsaturated wetlands, and other areas per the landowner request or as specified in the Project plans, commitments, or permits. The Contractor will not use topsoil to construct trench breakers or to pad the pipe. Topsoil segregation methods are shown in Figures 1, 2, and 3 of the EPP (Attachment D filed on February 11, 2020).

The Contractor will leave gaps in stockpiled topsoil and spoil piles at water conveyances (i.e., ditches, swales, and waterways) to maintain natural drainage and will install erosion control devices to protect the resources. In deep soils (more than 12 inches of topsoil), topsoil will be stripped to a minimum depth of 12 inches, unless otherwise specified/requested by other plans, permit conditions, or the landowner. Additional space may be necessary for spoil storage for stripping of more than 12 inches of topsoil. If less than 12 inches of topsoil are present, the Contractor will attempt to segregate to the depth that is present.

The Contractor will not typically segregate topsoil in forested areas, standing water wetlands, and nonagricultural open upland areas. However, the Contractor will segregate topsoil to the extent practicable and at the direction of Enbridge in areas of steep side slopes adjacent to wetlands and waterbodies, including forested areas, where excavating subsoil to create a level workspace.

Additionally, an environmental inspector ("EI") will perform audits of the topsoil/subsoil removal and segregation. Refer to the EPP provided as Attachment D, filed on February 11, 2020 for a more detailed discussion of topsoil segregation.

4.3.3 Hauling and Stringing Pipe

The Contractor will transport coated pipe, valves, and fittings by truck from material storage yards to various points along the Project route and will off-load the materials along the construction route using side boom tractors, mobile cranes, or vacuum lifting equipment.

4.3.4 Trenching

Prior to excavation activity, the Wisconsin Excavator's One-Call system (Digger's Hotline) will be notified as required for promoting proper marking of foreign utilities. Other safety precautions will be adhered to as required by Enbridge's safety practices and worker safety regulations.

Enbridge and the Contractor shall make best efforts and use industry standard practices to minimize the amount of open trench. This requirement is exclusive of any site-specific (e.g., horizontal directional drilling, guided bores, etc.) "tie-in" crews installing pipe at select crossings (roads, railroads, waterbodies, etc.) or valves, or areas having a significant amount of rock needing to be removed from the trench.

Enbridge will confine all construction equipment and vehicles to the approved right-of-way and extra workspace. The Contractor will take precautions to protect, repair, and/or replace damaged drainage systems (e.g., ditches, drainage tiles).

Trenching in uplands typically occurs using a backhoe excavator or a rotary wheel ditching machine. A backhoe is typically used to excavate the trench in wetlands. The equipment operator will sidecast (stockpile) excavated material within the approved construction right-of-way separate from topsoil (refer to the EPP, Attachment D filed on February 11, 2020). Enbridge will coordinate with landowners to minimize disruption of access caused by the trench during construction.

Enbridge anticipates encountering shallow bedrock during construction, therefore blasting may be required if shallow bedrock or boulders are encountered that cannot be removed by conventional methods. In these cases, the blasting measures identified in the Blasting Plan (Attachment E filed on February 11, 2020) will be implemented to remove rock from the trench line. If required, blasting will be conducted according to guidelines designed to control energy propagation and protect persons and property in the area. These activities will adhere to federal, state, and local regulations pertaining to blasting and blast vibration limits with regard to structures and underground utilities. Care will be taken when blasting in the vicinity of water wells.

In accordance with federal requirements (49 CFR § 195.248), the depth of cover between the top of the pipe and the ground level, road bed, or river bottom can range between 18 to 48 inches, depending on the location of the pipe and the presence of rock. Unless specifically exempted, current regulation requires operators to bury pipelines so that it is below the level of cultivation. Except as provided in paragraph (b) of 49 CFR § 195.248, the pipe must be installed so that the cover between the top of the pipe and the ground level, road bed, river bottom, or underwater natural bottom (as determined by recognized and generally accepted practices), as applicable, complies with the Table 4.3.4-1.

Table 4.3.4-1: Depth of Cover Requirements

Location	Cover in inches	
	Normal Excavation	Rock Excavation [a]
Industrial, commercial, and residential areas	36	30
Crossing of inland bodies of water with a width of at least 100 feet from high water mark to high water mark	48	18
Drainage ditches at public roads and railroads	36	36
Any other area	30	18

Notes:
[a] Rock excavation is any excavation that requires blasting or removal by equivalent means.

Pursuant to federal regulations, the majority of the pipeline will be buried with a depth of cover of 30 to 36 inches (from top of pipe to construction subgrade). Enbridge will ensure that it complies with the federal minimum depth of cover requirements.

4.3.5 Trench Dewatering

Groundwater or stormwater runoff may accumulate in the trench during construction activities. If trench dewatering is necessary to complete the installation of the pipe, the Contractor will pump the discharge through a sediment filter bag or a straw bale dewatering structure in such a manner that no heavily silt-laden water flows into streams or wetlands (refer to the EPP, Attachment D filed on February 11, 2020). Enbridge will obtain coverage under any applicable permits for these discharge activities, such as WPDES Permit WI-0049344-05-0, if required.

The Contractor will use a floating suction hose and elevated intake, or other similar measures, to keep the intake off the bottom of the trench and reduce the potential for capturing additional sediment in the trench water. The pump intake will be equipped with a screen, or equivalent device, to prevent fish uptake. The Contractor will select a dewatering method in conformance with Enbridge's EPP (Attachment D filed on February 11, 2020). The Contractor will direct water to well-vegetated upland areas and discharge at a rate to promote filtering and soaking into the ground surface. Enbridge's EIs will work with the Contractor to select dewatering operation discharge sites that drain away from waterbodies or wetlands. The Contractor may use multiple filtering mechanisms (e.g., geotextile bag within a straw bale dewatering structure), where necessary to achieve appropriate discharge water treatment.

4.3.6 Bending

Pipe will be delivered to the construction area in straight sections and bent to conform to changes required for pipeline alignment and to conform to natural ground/trench contours. Bending of the sections will be performed by track-mounted hydraulic pipe-bending machines. Prefabricated pipe bends will be required in certain locations where the required bends exceed the ability to be fabricated in the field.

4.3.7 Lineup, Welding, and Weld Inspection

Following bending, the Contractor will line up the sections of pipe and weld them together. Welding is one of the most important phases of pipeline construction. Enbridge's welding procedures have been developed and tested to strict industry standards and pipeline safety regulations. Welders are qualified and tested at the beginning of the project to ensure they meet Enbridge's welding procedures, which are qualified in accordance with U.S. Department of Transportation welding regulations.

49 CFR Part 195 generally requires nondestructive testing of 10 percent of field welds; however, Enbridge will exceed this requirement and require that every weld be inspected by nondestructive examination, to determine the quality of the weld. Weld defects will be repaired or removed as outlined in the API Standard 1104, "Welding of Pipelines and Related Facilities" and Enbridge related standards. Repaired welds will be tested to verify the final quality of the weld. Enbridge non-destructively inspects each individual weld prior to coating.

4.3.8 Field Coating

All pipe will be protected with an external coating designed to protect it from corrosion. Except for a small area at the end of the pipe joint, this coating is applied at the pipe mill before shipment to the site. After welding and inspection, girth welds will be coated with similar or compatible protective materials in accordance with required specifications. Before lowering-in, the pipe coating will be inspected for defects with special attention given to all field applied coatings. All defects will be repaired prior to lowering-in.

4.3.9 Lowering In

Prior to lowering-in, the trench will be inspected to ensure it is free of rocks and other debris that could damage the pipe or its protective coating. The trench will also be checked for wildlife that may have entered the excavation. Dewatering may be necessary to inspect the bottom of the trench in areas where water has accumulated. If dewatering is required, it will be conducted in accordance with the EPP (Attachment D filed on February 11, 2020) and applicable permits in a manner that will not cause erosion or result in silt-laden water flowing into a wetland or waterbody (see section 4.3.5).

Side boom tractors (or equivalent) will be used to lift the pipe from the temporary supports and lower the pipe into the trench. If the bottom of the trench contains rock, the pipe may be lowered onto sand placed on the bottom of the trench and the sidewalls, or other suitable padding materials. Topsoil will not be used to pad the pipe. In areas where the excavated trench material may damage the pipe, the pipe will be protected with a protective rock shield wrap or by similar measures. The pipe will be placed in the ditch to conform to the alignment of the ditch and not damage the coating. As necessary, trench breakers (e.g., stacked sand bags) will be installed in the trench around the pipe in steeply sloped areas to prevent movement of subsurface water along the pipeline in accordance with the EPP and/or specifications from applicable regulating agencies.

4.3.10 Backfilling

After lowering the pipe into the trench, the trench will be backfilled with material originally excavated from the trench using bladed equipment or backhoes. If the material excavated from the trench is rocky, the pipeline will be protected with a rock shield or covered with other suitable fill (i.e., crushed limestone rock or screened sand). Excavated rock will then be used to backfill the trench to the top of the existing bedrock profile in the trench. Any excess excavated materials or materials unsuitable for backfill will be spread evenly over the construction work area in an upland area, or disposed of at a licensed disposal facility. Excess rock may be used for beneficial uses such as construction of off-road vehicle barriers (if requested by the landowner), spread across the right-of-way (with landowner approval), or will be hauled off site to a licensed disposal facility. In areas where topsoil has been segregated, the subsoil will be placed in the trench first and then the topsoil will be placed over the subsoil. Backfilling will occur to grade or higher to accommodate soil settling over the trench.

During backfilling, special care will be taken to minimize erosion, restore the natural ground contour, and restore surface drainage patterns as close to preconstruction conditions as practical. To minimize the

possibility of subsurface water flow on slopes, approved trench breakers will be placed within the trench prior to backfilling. When the trench crosses streams or wetlands, trench plugs may be used to minimize the flow of water from the intersected body into the trench.

4.3.11 Hydrostatic Testing

After backfilling is complete, the Contractor will hydrostatically test the new pipeline segment to verify its integrity. Hydrostatic testing involves filling the new pipe segments with water acquired in accordance with applicable permits, raising the internal pressure level, and holding that pressure in accordance with U.S. Department of Transportation specifications. The Contractor may hydrostatically test prebuilt sections prior to installation for crossings using the horizontal directional drilling method.

Prior to hydrostatic testing of the installed pipeline, the Contractor will prepare the pipe by removing accumulated construction debris, mill scale, dirt, and dust using a cleaning pig. The Contractor will collect the debris in a temporary receiver and dispose of off-site. Upon completion of the cleaning operation, the Contractor will seal the pipeline with the test headers.

The Contractor will arrange test headers and pigs to allow for the installation of rinse water ahead of the fill pigs. The Contractor will treat and dispose of any rinse water in accordance with applicable permit conditions.

Following testing, the Contractor will depressurize the test section and discharge the water to a well-vegetated, upland area with an appropriate dewatering structure, such as a geotextile filter bag and/or a straw bale structure lined with geotextile fabric. Direct discharges to surface waters, if allowed by permit, will be through an energy dissipation device, such as a splash pup.

At no time will the discharge rate exceed the applicable discharge rates specified in state-issued or other discharge permits. In the event the permits do not specify a maximum discharge rate, the Contractor will monitor discharges and adjust as necessary to avoid scouring, erosion, or sediment transport from the discharge location.

To minimize the potential for introduction and/or spread of invasive species due to hydrostatic testing activities, Enbridge will discharge water to the same source location from which it appropriated. If the Contractor uses water to test multiple test sections, they will relay it back to the source water through the pipeline for final discharge. Unless the applicable agencies approve, the Contractor will not discharge test water to a waterbody other than the appropriation source.

Enbridge has completed additional design analysis and has developed a draft hydrostatic testing plan. Enbridge proposes two options for water withdrawals for use during hydrostatic testing of the mainline. The preferred option includes conducting hydrostatic testing in two sections and using water from the Bad River. The alternate option includes conducting hydrostatic testing in three sections and using water from Tyler Forks and Silver Creek. Additional details are included in the Draft Hydrostatic Test Plan in Attachment K. Water used for HDD drilling activities will be acquired from municipal sources. As described in the Environmental Protection Plan, Enbridge will hydrostatically test pre-built sections of the HDDs. Water sources for each pre-built section are included in the Draft Hydrostatic Test Plan in Attachment K. Water appropriation and discharge will be conducted in accordance with applicable regulations and permits conditions.

4.3.12 Road and Railroad Crossings

The Project will cross federal/state road and county/city roads. Enbridge will obtain applicable federal, state, county, and township permits before conducting road crossings, and will obtain permission to cross any railroads. The contractor will post temporary signs at each crossing as appropriate to alert motorists of construction activity.

At this time, Enbridge anticipates that gravel/dirt roads will be open cut and paved roads and railways will be bored, however should the appropriate authority having jurisdiction allow open cut of paved roads, Enbridge may open-cut such roads. For open-cut roadways, Enbridge will temporarily close the road and establish detours. Although this may cause a short-term inconvenience to some drivers, most road crossings will occur in one day which should not significantly disrupt local traffic patterns. After the pipeline is installed and backfilled, Enbridge will restore road surfaces and shoulders. Boring will allow Enbridge to install the pipeline beneath paved roads and railroads without disrupting traffic. Boring operations will start with having an entry and exit point established on either side of the road or railway that is being crossed, where the boring will occur. During drilling, the road or railway crossed will be surveyed to ensure that the boring has not impacted the road or railway.

4.3.13 Final Tie-in and Commissioning

After hydrostatic testing, the final pipeline tie-in will be completed and commissioning will commence. Commissioning involves activities to verify that equipment is properly installed and working, controls and communications systems are functional, and the pipeline is ready for service. The pipeline will be cleaned, dried, and inspected using in-line inspection tools (pigs) to detect anomalies in the pipe that may have been introduced during construction, and prepared for service by purging the line of air and loading the line with crude oil.

4.3.14 Cleanup and Restoration

Cleanup involves removing construction debris (including litter generated by construction crews and excess rock). Initial cleanup and rough-grading activities may take place simultaneously. Rough and final grading includes restoring disturbed areas as near as practicable to preconstruction conditions, returning the topsoil, preparing a seedbed (where applicable) for permanent seeding, installing or repairing temporary erosion control measures, repairing/replacing fences, and installing permanent erosion controls (refer to Attachment D filed on February 11, 2020). Construction work area cleanup and stabilization will commence within 72 hours after backfilling the trench, as weather permits. Final grading, topsoil replacement, seeding, and installation of permanent erosion control structures will be completed within 20 days after backfilling the trench (10 days in residential areas). If construction or restoration unexpectedly continues into the winter season conditions prevent compliance with these timeframes, temporary erosion control devices ("ECDs") will be installed and maintained until conditions allow completion of cleanup.

Pipeline markers will be located along the right-of-way and installed in accordance with Title 49 CFR Part 195. The markers will identify Enbridge as the operator and list telephone numbers for emergencies and inquiries. These facilities will generally be located at regular intervals adjacent to road crossings but within the operational right-of-way. Periodic inspections of the right-of-way will be conducted and further restoration measures will be implemented as necessary.

4.3.15 Revegetation

Revegetation measures will be implemented in accordance with the EPP (refer to Attachment D filed on February 11, 2020), landowner agreements, and project-specific permit conditions. Non-cropland will be

revegetated in accordance with recommendations from state or local soil conservation authorities or as requested by the landowner. Wetland areas will be reseeded in conformance with the USACE and the WDNR specifications, and in accordance with the EPP (refer to Attachment D filed on February 11, 2020). Unless specifically requested by landowners or land managing agencies, Enbridge does not intend to establish temporary vegetation in actively cultivated land, standing water wetlands, and/or other standing water areas.

Temporary revegetation may be established in construction work areas where 14 days or more will elapse between the completion of final grading at a site and the establishment of permanent vegetation, and/or where there is a high risk of erosion due to site-specific soil conditions and topography. Enbridge may require the Contractor to conduct temporary seeding sooner than 14 days at site-specific locations near sensitive resource areas and/or areas prone to wind/water erosion. Temporary vegetation will be established at any time between April 1 and September 1.

Enbridge will establish permanent vegetation in areas disturbed within the construction workspace, except in actively cultivated areas and standing-water wetlands. Enbridge developed a standard upland seed mix for restoring disturbed areas affected by the Project (refer to the EPP, Attachment D filed on February 11, 2020). The mix includes species that will provide for effective erosion control and revegetation of the Project area. Enbridge will use this seed mix as the standard upland mix unless landowners or land managing entities specify an alternate seed mix. Enbridge also developed specialized seed mixes for residential areas, wildlife areas, and Conservation Reserve properties. These seed mixes will be available to landowners by request.

The Contractor will apply seed uniformly at specified rates across the prepared right-of-way by drilling, broadcasting, hydroseeding, or air seeding. Enbridge will suspend seeding activities if conditions are such that equipment would cause rutting of the surface in the designated seeding areas. Enbridge will continue to monitor right-of-way conditions to resume seeding activities as site conditions improve and according to the general seeding timing restrictions. Seeding equipment will be capable of uniformly distributing the seed and sowing it at the required depth. Enbridge will monitor the success of revegetation efforts in restored areas in accordance with conditions identified in the applicable Project permits and/or licenses.

4.4 EROSION AND SEDIMENT CONTROL PRACTICES

Temporary erosion control measures slow the flow velocity of water off-site to minimize erosion, stop the movement of sediments off the construction right-of-way, and prevent the deposition of sediments into sensitive resources that may be on or adjacent to the right-of-way. The Contractor will install temporary erosion control measures after initial clearing and before disturbance of the soil at the base of sloped approaches to streams, wetlands, and roads, and in other areas as necessary to prevent sediment transport into sensitive resource areas. Temporary erosion control measures will be replaced by permanent erosion controls during final cleanup restoration. Temporary erosion and sediment controls include, but are not limited to, slope breakers, sediment barriers, storm water diversions, trench breakers, mulch, and revegetation. Additional details on erosion and sediment control measures are in the EPP (Attachment D filed on February 11, 2020).

Enbridge will require the Contractor to maintain erosion and sediment control structures as required in the Project's construction documents and as required by all applicable permits. The Contractor will repair, replace, or supplement nonfunctional erosion and sediment control features with functional materials as soon as field conditions allow access, but no later than 24 hours after discovery.

4.4.1 Fugitive Dust

Fugitive dust emissions may occur because of blasting or vehicle traffic on paved and unpaved roads. The amount of dust generated depends on the moisture content and texture of the soils, wind velocity, frequency of precipitation, vehicle traffic, types of vehicles, and roadway characteristics. Enbridge anticipates dust emissions to be greater during dryer months and in fine-textured soils.

Enbridge will minimize dust generation from construction activities by utilizing control practices, such as wetting soils on the right-of-way, limiting working hours in residential areas, and/or taking additional measures as appropriate based on site-specific conditions. The use of dust suppression techniques will minimize fugitive dust emissions during construction of the Project, thereby minimizing potential air quality impacts on nearby residential and commercial areas.

4.4.2 Spill Prevention and Management

Enbridge requires its contractors to implement proper planning and preventative measures to minimize the likelihood of spills and to clean up a spill should one occur. Enbridge's EPP outlines minimum standards for handling and storing regulated substances and cleaning up spills (refer to Attachment D filed on February 11, 2020). Potential sources of construction-related spills include machinery and equipment failure, fuel handling, transfer accidents, and storage tank leaks. In the event of a spill, the Contractor will abide by all applicable federal, state, and local regulations with respect to reporting and cleaning up the spill.

4.5 SPECIALIZED CONSTRUCTION—WATERBODIES

The Project will cross ephemeral, intermittent, and perennial waterbodies. Enbridge proposes to use the open-cut (wet-trench), dry crossing (flume or dam-and-pump), and horizontal directional drill ("HDD") methods to construct the pipeline across waterbodies. In each case and for each method, Enbridge will adhere to the measures specified in the EPP (Attachment D filed on February 11, 2020) and additional requirements identified in applicable permits and approvals from the USACE and the WDNR.

The width of the trench in waterbodies is dependent on several factors including depth of the trench, soil type, and soil saturation. Enbridge estimates that the width at the bottom of the trench would be a minimum of 42 inches up to approximately 72 inches. The width at the top of the trench would be a function of depth versus soil stability at that specific location, but may be approximately 15 to 20 feet in width. Enbridge will minimize the width of the trench through waterbodies by minimizing the length of time the excavated ditch is open to reduce the potential for slumping and/or ditch cave-ins.

Enbridge has continued to assess constructability of the pipeline, including using a trenchless installation technique to cross select features. Enbridge is proposing to install the pipeline using the HDD method or the direct pipe method at 13 locations, which are listed in Table 4.5-1a.

Enbridge proposes to use typical open cut (wet trench) construction techniques to cross waterbodies if no flow is present at the time of the crossing. Equipment to complete dry-ditch crossings will be onsite as a contingency should stream flow begin during construction. Crossings of most flowing waterbodies will be accomplished using the flume, dam-and-pump, or open-cut (wet trench) methods. Spoil excavated from the trench will be placed on the bank above the high water mark for use as backfill. A prefabricated segment of pipeline will be placed into the trench using side-boom tractors or similar. Concrete coating, pipe sacks, or set-on weights will be used, as necessary, to provide negative buoyancy for the pipeline. Once the trench is backfilled, the banks will be restored as near as practicable to preconstruction contours and stabilized in accordance with Enbridge's EPP and applicable waterbody crossing permits. Stabilization measures will include seeding, installation of erosion control blankets, or installation of riprap materials, as appropriate.

Excavated material not required as backfill to reestablish the streambed profile or stream banks will be removed and disposed of at upland disposal sites. In each case and for each method, Enbridge will adhere to measures specified in Enbridge's EPP and additional requirements specified in waterbody crossing permits.

Table 4.5-1a: HDD and Direct Pipe Crossings

Primary Crossing Feature	Near Milepost	Crossing Method
White River	4.0	HDD
Deer Creek	6.4	HDD
Marengo River	11.4	Direct Pipe
Brunsweiler River	14.1	HDD
Highway 13	15.2	HDD
Trout Brook	16.6	HDD
Billy Creek	17.3	HDD
Silver Creek	19.1	HDD
Krause Creek	22.3	HDD
Bad River	24.2	HDD
Tyler Forks	34.0	HDD
Potato River	37.9	HDD
Vaughn Creek	39.6	HDD

As described in Section 23.3 of the EPP, Enbridge would construct temporary dams for dry crossings using sandbags, inflatable dams, aqua-dams, sheet piling, and/or steel plates both upstream and downstream of the proposed trenchline to isolate the work area from the stream flow. The dams will extend across the entire streambed and will be built to a height to withstand the highest water levels anticipated at the time of construction. Water will either be pumped around the isolated work zone or will be directed into flume pipes extending through the temporary dams and across the isolated area to maintain downstream flow throughout the construction process. Enbridge does not propose to cross any waterbodies using a cofferdam system as this method introduces higher safety risks with having personnel in an open excavation within the streambed to complete tie-in welds. Enbridge will attempt to cross larger waterbodies proposed as a dry crossing technique under either normal or low flow conditions. Enbridge will delay initiating a crossing under high flow conditions. Enbridge proposes to cross smaller intermittent waterbodies with flowing water at the time of construction using similar methods as those described above.

Enbridge will avoid and minimize impacts on waterbodies by implementing the measures described in its EPP (refer to Attachment D filed on February 11, 2020). Enbridge's EPP outlines construction-related environmental policies, procedures, and mitigation measures Enbridge developed for its pipeline construction projects based on their experience during construction. It meets or exceeds applicable federal, state, and local environmental protection and erosion control specifications, technical standards, and practices.

Temporary bridges will be installed across waterbodies to allow construction equipment and personnel to travel down the construction right-of-way (refer to Table 4.5-1). Enbridge is proposing to only use engineered bridges and would not use instream supports. Attachment L provides descriptions of and drawings for the engineered bridges that will be used for vehicle travel over waterbodies. There are 3 bridge options that will be used; Type A are timber mat bridges typically 20-feet long or less); Type B is an engineered bridge that is 20 to 60 feet long, and Type C is an engineered bridge that is greater than 60 feet long. Bridges over waterbodies would meet the requirements of the WDNR Administrative Code ("NR") 320.04. Enbridge will work with WDNR as outlined in NR 320.04(3) to maintain access if the requirements of NR 320.04 cannot be met at a specific location.

At all bridge locations, care will be taken to minimize disturbance of the stream bank and bottom. Temporary crossing structures will be installed to withstand the highest flow expected to occur while the structure is in place, will not restrict flow or pool water while the bridge is in place, and will be constructed with clean materials. The Contractor will install equipment bridges during clearing activities and will not remove them until construction access is no longer required, typically during the restoration phase on construction.

Typically, temporary construction access bridge installation can be completed from adjacent areas, and equipment is not required to pass once through a stream to cross to the other side for installation. However, for the bridge installation at Tyler Forks (waterbody sira004p) on Casey Sag Road (access road 085) and at the HDD crossing of Tyler Forks (waterbody sirc005e), equipment will need to pass once through Tyler Forks for bridge installation and removal at each location. In order to place and remove an appropriate bridge to meet the WDNR requirements of 5 feet of clearance for navigation, an excavator or crane will be required to help maneuver the proposed engineered bridge into place. Currently, the stream on Casey Sag Road is forded by the public and logging trucks via an existing rocked crossing; therefore, impacts on the streambed from a one-time pass of equipment in order to install and remove the bridge will be minimal. Enbridge is requesting approval to allow equipment to pass through Tyler Forks at Casey Sag Road and at the HDD crossing of Tyler Forks for both bridge installation and removal.

The Contractor will leave a 20-foot buffer (from the ordinary high water mark ["OHWM"]) of undisturbed herbaceous vegetation on all stream banks during initial clearing, except where grading is necessary for bridge installation, or where applicable regulations and/or permit conditions restrict. The Contractor may cut and remove woody vegetation within this buffer during clearing, leaving the stumps and root structure intact. The Contractor will leave non-woody vegetation and the soil profile\intact until they are ready to begin trenching the stream crossing. The Contractor will properly install and maintain sediment control measures at the 20-foot buffer line adjacent to streams immediately after clearing and prior to initial ground disturbance.

Where necessary, ATWS will be used to accommodate additional equipment and materials associated with waterbody crossings. Enbridge designed ATWS as follows:

- ATWS will be at least 50 feet away from the OHWM if topographic or other physical conditions, such as stream channel meanders, allow.
- If safe work practices or site conditions do not allow for a 50-foot setback, ATWS will be no closer than 20 feet from the OHWM, subject to site-specific approval.

Instream trenching and backfilling will typically be complete within 24 hours or less on minor waterbodies (less than 10 feet wide) and 48 hours or less on intermediate (between 10 and 100 feet wide) or as directed by applicable permits. Use of dry crossing techniques will require additional time associated construction and removal of temporary dams.

Table 4.5-2 describes the waterbody-crossing techniques Enbridge intends to utilize during construction. Refer to Section 23 of the EPP for details regarding construction procedures and mitigative measures for each crossing method. The EPP also details procedures for temporary and permanent stabilization.

Table 4.5-1: Types of Bridges

Type	Description	Applicability	Advantages	Disadvantages
Typical Span Type Bridge (timber mats, railroad flat cars, or similar)	Construction of temporary bridge utilizing timber mats or an imported portable bridge material (e.g., railroad flat cars).	Generally suitable for small to moderate size streams with stable banks. Multiple bridge spans and instream abutments. This bridge type can be used for large waterbodies. Regular bridge maintenance required. Preferred bridge type to provide safe crossing of heavy construction equipment. No instream supports will be used.	• Strong, removable, and portable bridge that can be optimally located • Limited instream disturbance • Limited sediment release • Maintains streamflow • Maintains fish passage	• Specialized equipment / crew required • Substantial amount of work to transport and/or construct may be necessary • Limited span for timber bridges and cap [a] may be required • Regular maintenance of erosion and sediment controls required • Possible sediment release from bank disturbance • May cause interference on navigable waterways • Bridges need to be keyed into the banks

[a] The term "cap" refers to bridge decking installed over the primary bridge span supports. This decking is intended to provide a safe surface for construction equipment and personnel, and cover any gaps that may exist between bridging materials that could allow soil that may fall off equipment traveling across the bridge to enter the waterbody. Decking may consist of heavy plywood or comparable materials. If the decking is inadvertently dislodged, sediment could fall into the waterbody. To prevent this, Enbridge often utilizes sideboards with a poly underlayment between mat decking layers that is then wrapped up and around the sideboards to capture sediment that may be fall onto the decking during construction. This technique is often referred to as a diaper or cap.

Table 4.5-2: Pipeline Waterbody Installation Methods

Method	Description	Applicability	Advantages	Disadvantages
Wet Trench	Open-cut crossing technique that involves trenching through the waterbody while water continues to flow across the instream work area.	Generally suitable for small, non-fishery streams, such as agricultural ditches and intermittent waterways, as well as larger waterbodies where other crossing methods are not practical. In Wisconsin, these are primarily waterbodies located within large, saturated wetlands, and waterbodies with beaver dams.	• Rapid construction / installation • No need for specialized equipment • Compatible with granular substrates and some rock • Minimizes period of instream activity • Generally maintains streamflow • Maintains fish passage • Relatively short duration of sediment release (<24 hours)	• Requires implementation of erosion and sediment control devises to mitigate potentially high sediment release during excavation and backfilling • Instream stockpiling of spoil on wide watercourses • May interrupt streamflow

Method	Description	Applicability	Advantages	Disadvantages
Dry Crossing—Dam and Pump	Create a dry work area by damming the flow up and downstream of the crossing and pumping water around. Dam materials may include, but are not limited to, sand bags, aqua dams, sheet piling, or street plates.	Generally suitable for streams with low flow and defined banks where fish passage is not of concern. Generally works best in non-permeable substrate and preferred for crossing meandering channels.	• Limited sediment release • Maintains streamflow • Minimal release and transport of sediment downstream that is not likely to result in negative effects to fish and fish habitat. • Relatively dry working conditions • May be adapted for non-ideal conditions • Hose can be routed around area of construction • May reduce trench sloughing and trench width	• Minor sediment release during dam construction, dam removal, and as water flushes over area of construction • Slow construction / installation resulting in extended period instream and prolonged sediment release • Fish salvage may be required from dried-up reach • Short-term barrier to fish movement • Specialized equipment and materials • Slow construction / installation • Hose(s) may impede construction traffic • Seepage may occur in coarse, permeable substrate • Susceptible to mechanical failure of pumps

Method	Description	Applicability	Advantages	Disadvantages
Dry Crossing—Flume	Create a dry work area by damming the flow up and downstream of the crossing and installing flume to convey water. Dam materials may include, but are not limited to, sand bags, aqua dams, sheet piling, or street plates.	Generally suitable for crossing relatively narrow streams that have straight channels and are relatively free of large rocks and bedrock at the point of crossing where fish passage is of concern. The waterbody should have defined banks and channel with solid, fine-textured substrate.	• Limited sediment release • Maintains streamflow • May allow fish passage • Minimal release and transport of sediment downstream that is not likely to result in negative effects to fish and fish habitat • Allows for flushing of substrates • Relatively dry or no flow working conditions • May be adapted for non-ideal conditions • May reduce trench sloughing and trench width	• Minor sediment release during dam construction, removal and as water flushes over area of construction • Slow construction / installation • Fish salvage may be required from dried-up reach • Short-term barrier fish passage if water velocity in culvert is too high • Difficult to trench and lay pipe, especially large diameter pipe, under flume pipe • Work area may not stay dry in coarse, permeable substrate • Seepage may occur in coarse, permeable substrate

Method	Description	Applicability	Advantages	Disadvantages
Horizontal Directional Drilling (or other similar trenchless method such as guided bore)	Place a rig on one side of the waterbody and drill a small-diameter pilot hole under the waterbody along a prescribed profile. Upon completion of the pilot hole, the Contractor uses a combination of cutting and reaming tools to accommodate the desired pipeline diameter. Drilling mud is necessary to remove cuttings and maintain the integrity of the hole. The Contractor then pulls the pipe section through and welds the adjoining sections of pipe on each side of the waterbody.	Generally suitable to cross sensitive or particularly deep, wide, or high-flow waterbodies and depends on site-specific topography and the local geologic substrate. Typically drilling is not feasible in areas of glacial till or outwash interspersed with boulder and cobbles, fractured bedrock, or non-cohesive coarse sands and gravels. This method requires a minimum crossing length of 1,280 feet for 30-inch outside diameter pipe with 56 feet of depth and 90 feet bottom tangent. The minimum length assumes similar elevations on each side of the crossing.	• No sediment release unless an inadvertent return occurs • Minimal bank and approach slope disturbance • No streambed disturbance unless an inadvertent return occurs • Maintains normal streamflow • Maintains fish passage • Significantly reduces cleanup and restoration in between entry and exit points • May be able to construct during sensitive fisheries restricted-activity windows	• Potential for inadvertent release of drilling fluids in unconsolidated gravel, coarse sand, and fractured bedrock and clays • Requires ATWS on both sides of the crossings to stage construction, fabricate the pipeline, and store materials • Tree and brush clearing is necessary to install guide wires for monitoring and steering the drill bit • Requires obtaining water to formulate the drilling fluid as well as hydrostatic testing • Success depends on substrate • Requires specialized equipment • Slow construction / installation • Limited drilling radius that is allowed for pilot hole • Pull string area along the alignment for the same length of the crossing to allow continuous pullback • Drill stem may get “stuck in the hole” and tools can get lost, especially on large diameter reams • No guarantees that drill will be successful • May damage coating / pipe during pullback

Notes: ATWS = additional temporary workspace
Source: Canadian Association of Petroleum Producers, Canadian Energy Pipeline Association, and Canadian Gas Association, 2005.

4.5.1 Geotechnical Soil Borings and HDD Feasibility Assessments

Enbridge is proposing to cross select waterbodies using the HDD crossing technique. Enbridge has completed geotechnical soil borings at each of the proposed HDD crossings to assess subsurface conditions and evaluate the feasibility of successfully completing each crossing by HDD. Soil borings were taken at each crossing to obtain the following information:

- standard penetration test values;
- classification of soils;
- gradation curves for samples where gravel is encountered;
- estimated values under undrained conditions for moist unit weight, modulus of elasticity, cohesion, and friction angle for changes in strata;
- rock quality designation and percent recovery;
- representative Mohs hardness values;
- unconfined compressive strength values; and
- rock types.

Enbridge is providing plan and profile drawings for proposed trenchless waterbody crossings (HDD and direct bore) in Attachment M, based on geotechnical information gathered during 2019 and 2020 survey activities.

4.5.2 Restoration at Waterbody Crossings

The Contractor will restore the instream trench such that the stream bottom is as near as practicable to its preconstruction condition, with no impediments to normal water flow. The streambanks will be restored as near as practicable to preconstruction conditions, unless the original slope is determined to be unstable. If there is a potential for significant bank erosion, the Contractor may stabilize disturbed stream banks with rock riprap or other bank protection, with WDNR and USACE approval.

Temporary slope breakers will be installed on all sloped approaches to streams in accordance with the spacing requirements outlined in the EPP (refer to Attachment D filed on February 11, 2020). Trench breakers will also be installed at the stream banks, as necessary, where slopes are adjacent to the waterbodies to prevent subsurface water flow and erosion along the trench line. Trench breakers typically consist of burlap sandbags filled with rock-free subsoil or sand and placed from the bottom of the trench to near the top surrounding the pipe. Permanent stabilization will be initiated within 24 hours unless site and weather conditions delay permanent installation.

Once the banks are reshaped, the banks will be seeded and stabilized with erosion control BMPs as specified in the EPP (refer to Attachment D filed on February 11, 2020). Stream bank vegetation will be reestablished using the seed mix in Appendix B of the EPP (Attachment D filed on February 11, 2020), unless applicable agencies specify otherwise. Where a waterbody is within a wetland, the banks will be reseeded with the applicable wetland seed mix.

The travel lane portion of the construction right-of-way and the temporary bridge will remain in place until pipeline construction activities (including final cleanup) are complete. Permanent slope breakers will be installed across the full width of the right-of-way during final cleanup. The Contractor will remove temporary bridges during the final cleanup and restoration phase of construction after installation of the new pipeline and right-of-way access is no longer required. Enbridge will remove temporary sediment control devices across the construction right-of-way only after achieving vegetative cover, in accordance with permit conditions.

4.6 SPECIALIZED CONSTRUCTION—WETLANDS

Enbridge proposes to use special construction methods in non-farmed wetlands. In wetlands actively farmed at the time of construction, Enbridge will construct the pipeline using standard upland methods. Similar to the construction process described for upland areas, construction in wetlands occurs in a sequential manner and consists of clearing, pipe stringing, trenching, dewatering, installation, backfilling, final cleanup, and revegetation activities. Due to the nature of linear construction, activities will occur within the proposed temporary construction workspace and will transition through the respective construction activities such as clearing, grading, trenching, and restoration. A wetland specific figure has been provided (Figure 4.6-1) that illustrates the breakdown of how the construction workspace is used.

Clearing the construction right-of-way in wetlands will proceed in a manner similar to clearing in uplands. Typically, the Contractor will use low-ground-pressure equipment, limiting disturbance to the wetland. Where low ground pressure equipment is not used, construction equipment will operate from timber construction mats or equivalent means. As part of the clearing process, Enbridge will cut vegetation and trees within wetlands at ground level leaving existing root systems intact. Large clearing debris will generally be removed from the wetland for disposal. Hydro-axe debris, or similar (material that is less than 1.5-inch diameter and/or 12 inches in length) can be left in the wetland if spread evenly in the construction workspace to a depth that will allow for normal revegetation (less than 2-inch thickness), as determined by the Environmental Inspector (EI). Enbridge will conduct clearing activities using low ground-pressure equipment or operating off temporary construction mats. Temporary construction matting in wetlands will typically be installed following vegetation removal. In forested wetlands, mats will be installed following tree felling. Mat travel lanes are typically a single layer; however, there may be cases in saturated areas where more than one layer of mats must be placed to provide a stable working surface. If there are multiple layers of mats, Enbridge will probe the soil after mats have been removed to verify that no additional mats remain. Temporary construction matting is typically installed during or immediately following clearing activities and remains in place until access through the wetland is no longer required for construction activities. Mats will typically be removed as part of the final restoration and clean-up phase of the Project. Temporary construction matting may remain in place in any specific wetland from weeks to months, depending on the location and the activities that are occurring in or near the specific wetland. Enbridge will restore these areas according to the EPP. When clearing in wetlands, the following restrictions apply:

- Grading activities will be confined to the area of the trench. Enbridge will only allow grading outside the trench where required to ensure safety and to restore the construction right-of-way after backfilling the trench.

- The clearing of extra workspaces will be minimized in forested wetlands as much as practicable and in accordance with applicable permits.

- Vegetation and trees within wetlands will be cut off at ground level, leaving existing root systems intact.

- Hydro-axe debris, or similar, can be left in the wetland if spread evenly in the construction right-of-way to a depth that will allow for normal revegetation, as determined by the EI.

- Staging areas, additional spoil storage areas, and other ATWS areas will be in upland areas at least 50 feet away from wetland boundaries, where safe work practices or site conditions permit. Where site conditions do not permit a 50-foot setback, these areas will be located as far away from the wetland as practicable.

Enbridge will minimize impacts in wetlands by implementing the mitigative measures specified in its EPP, including:

- Use of construction mats, as needed, to facilitate equipment access and pipeline installation;

- Installation of temporary erosion control devices after clearing activities (refer to the EPP (Attachment D filed on February 11, 2020);

- Segregating up to 1 foot of topsoil over the trench line in unsaturated wetlands;

- Restoration to preconstruction conditions; and

- Maintaining wetland hydrology using trench breakers when necessary.

Enbridge has attempted to minimize wetland disturbance within riparian areas of waterbodies proposed to be crossed using the HDD method by extending the HDD, where feasible based on site conditions, to include riparian wetlands.

Timing of construction will be dependent on receipt of all applicable permits and approvals. Enbridge anticipates construction starting during frozen conditions, but expects construction activities to continue into the summer. Matting in wetlands will typically be used in most circumstances due to duration of construction and changing ground conditions. If frozen ground is present at the time of construction, Enbridge will evaluate the need for temporary construction matting, in conjunction with frozen ground conditions based on site conditions at the time of construction.

Similar to the width of the trench in waterbodies, the width of the trench in wetlands is dependent on several factors including depth of the trench, soil type, and soil saturation. The bottom width of the trench will be sufficient to accommodate the pipeline. The width at the top of the trench will vary to allow the sides of the trench to be adapted to local conditions at the time of construction and to safely allow personnel into the trench where necessary. Enbridge will minimize the width of the trench through wetlands by minimizing the length of time the excavated ditch is open to reduce the potential for slumping and/or ditch cave-ins. Enbridge estimates that the width at the bottom of the trench would be a minimum of 42 inches up to approximately 72 inches. The width at the top of the trench would be a function of depth vs soil stability at that specific location, but may be approximately 15 feet in width. Trench boxes may be used in limited site-specific conditions, such as at road bores, to minimize the potential for trench wall collapse. The use of trench boxes will be determined on a site-specific basis based on field conditions at the time of construction. The use of trench boxes for mainline pipeline installation, outside of the site-specific areas mentioned above, is not practicable and would likely not reduce wetland disturbance due to the additional trench width necessary to install trench boxes and additional disturbance duration required to install the pipeline through the trench boxes.

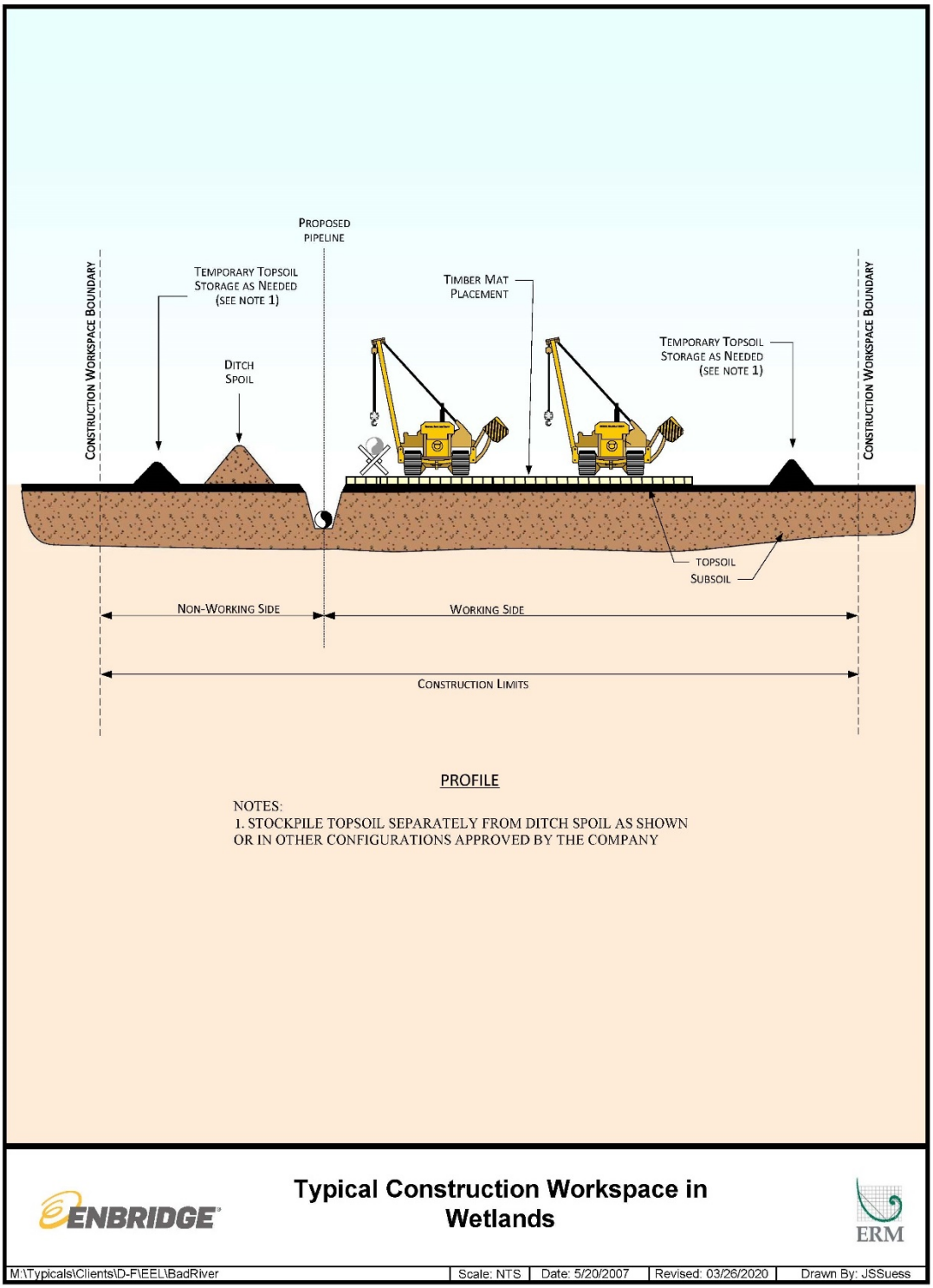

Figure 4.6-1 Wetland Construction Sequencing

4.6.1 Restoration in Wetlands

Wetlands will be restored as near as practicable to preconstruction conditions. During backfilling of wetland areas, the Contractor will replace subsoil material removed from the trench during construction so that it does not mound above the adjacent ground surface (undisturbed trench wall). The Contractor will remove subsoil that exceeds the elevation of the ground adjacent to the trench from the wetland and dispose in an upland area or at an approved disposal site. After backfilling the trench with subsoil, the Contractor will spread the previously segregated topsoil over the trench area and mound no more than 12 inches, or as specified in the applicable permits, to allow for minor soil settling within the backfilled ditch.

Cleanup and rough-grading activities may take place simultaneously. Cleanup typically involves removing construction debris and replacing fences removed during construction. Rough grading will include restoring original conditions within the disturbed areas (i.e., ditchline, spoil storage areas, and equipment travel lane) and installing or repairing temporary ECDs. Cleanup and rough grading (including installation of temporary ECDs) will begin as soon as practical after backfilling the trench, weather permitting. The Contractor will remove all timber mats, construction debris, and larger woody vegetative debris during cleanup of wetlands.

The Contractor will seed wetlands, unless standing water is present, with seed mixes provided in Appendix B of the EPP (Attachment D filed on February 11, 2020). The Contractor will not apply fertilizer or lime in wetlands.

4.6.2 Wetland Mitigation

In addition to the wetland restoration noted in Section 4.6.1, Enbridge continues to work with the WDNR and USACE on wetland mitigation requirements. Refer to Section 6.4.2.2 for a description of the proposed wetland mitigation.

4.6.3 Post-Construction Wetland Monitoring

Enbridge continues to consult with WDNR and USACE regarding post construction wetland monitoring that may be required by permit conditions.

4.7 INVASIVE SPECIES MANAGEMENT

After disturbances of the soil, vegetation communities may be susceptible to infestations of noxious species. These species are typically most prevalent in areas of prior surface disturbance, such as agricultural areas, roadsides, existing utility corridors, and wildlife concentration areas. Enbridge's EPP (Attachment D filed on February 11, 2020) addresses the control and spread of noxious and invasive species. Refer to Attachment F, filed on February 11, 2020 for a list of invasive species within the Project area.

Enbridge believes it is not practicable to eradicate undesirable species where undesirable species presently exist adjacent to its right-of-way. Enbridge will minimize the potential for the establishment of undesirable species by minimizing the time duration between final grading and permanent seeding. Enbridge will also require the Contractor clean construction equipment before arriving on-site to prevent the introduction of undesirable species to the Project area. The Contractor will be responsible for identifying and acquiring sources of weed-free mulch, and Enbridge will approve the sources prior to purchase.

Enbridge will conduct field surveys along the entire Project route in both wetlands and upland areas to identify existing locations of noxious weeds and invasive species.

4.8 OPERATION, INTEGRITY, AND EMERGENCY RESPONSE

Enbridge takes numerous proactive steps to prevent spills through the design, operation, and maintenance of the Project. As explained below, Enbridge implements a comprehensive integrity management program to identify, excavate, repair, and/or replace anomalies that may cause a release. In the event of a release, for example, Enbridge incorporates remotely operated valves to mitigate the extent of a release. Enbridge also has in place sophisticated leak detection methods and procedures, as well as a newly revised emergency response program to clean up a release.

Enbridge will construct the Project to the highest standards, including the application of coating to prevent corrosion. Lengths of pipe will be coated with an epoxy that is then fusion-bonded to the pipe at the factory. The last 3-6 inches on each end of each piece of pipe will be masked such that no coating is deposited in this area. After the pipes have been welded together a corrosion prevention coating will be applied to the weld areas. Prior to backfill the pipe will have a corrosion inspection take place and any defects found will be repaired. In areas where the pipe will be installed by sliding the pipe longitudinally, typically at locations installed by boring or drilling, the pipe will have a topcoat of coating applied to resist any abrasion that may occur in the installation process.

Enbridge will install cathodic protection to provide ongoing protection the pipeline from corrosion during its normal operation when in service. When a pipeline is placed near a high voltage power line, the power line can induce voltage on the pipeline. In order to combat this, where applicable, facilities will be installed to prevent this from occurring. These facilities are referred to as "AC Mitigation" facilities.

The following sections summarize the procedures that Enbridge will implement to mitigate the risk of spills from the Project.

4.8.1 Integrity Management Program

In accordance with the federal regulations established by the U.S. Department of Transportation in 2001 (revised in 2007), Enbridge has formalized its Integrity Management Plan ("IMP"). Although these regulations are not prescriptive, they are very comprehensive and require pipeline operators to develop and maintain an IMP consistent with 49 C.F.R. § 195.452. Enbridge's IMP meets or exceeds the requirements of the federal regulations.

Enbridge's pipeline integrity management focuses on the following goals:

- Prevent threats;
- Monitor condition; and
- Mitigate to maintain fitness.

These goals are more fully described in the sections below.

Preventing Integrity Threats

Enbridge collects data and assesses the pipeline system and its environment. Some examples of potential measures Enbridge employs include:

- Enbridge combats external corrosion through the use of effective coatings and by applying cathodic protection, which consists of running low electrical currents through the pipe to protect the steel.

- Enbridge requires its vendors to meet stringent standards for the quality of the pipe and equipment. A comprehensive inspection system helps Enbridge to achieve this quality, step-by-step and with precision. The inspectors examine the formed pipe for possible defects. They monitor ultrasonic and x-ray tests that examine the integrity of each weld and, using calipers and micrometers, they assess each section for exact tolerances on diameter, roundness, and straightness.

- Enbridge has been an active leader and advocate of the nation-wide one-call system. Enbridge also has a comprehensive public awareness program in place to engage landowners, community members, and first responders to ensure that they are aware of Enbridge's pipelines and related facilities. Each year Enbridge sends out approximately one million pipeline safety brochures to residents, businesses, school officials, emergency responders, public officials, farmers, and excavators near our pipelines. Finally, active monitoring of the right-of-way is also used to prevent third party damage. These programs reduce the threat of third-party damage to the pipeline.

- During construction, quality control is essential. Enbridge's quality control program for welds exceeds federal requirements. For example, Enbridge exceeds the federal weld testing requirements by x-raying 100 percent of its welds, even though federal regulations require testing of only 10 percent of the welds.

Monitoring of Integrity Threats

Enbridge invests heavily every year in advanced leak detection, damage prevention, and pipeline integrity management technologies. Enbridge verifies the integrity of its system using multiple comprehensive diagnostic capabilities, including:

- The most sensitive in-line inspection tools available for all mainlines and certain facility piping;

- Hydro-testing during pipe manufacture, pipeline commissioning, and in-line inspection verification studies;

- On-line sensors, which read pressures/cycling, pipe movement, external and internal corrosion, and vibration;

- Surveys to measure pipe depth, geotechnical conditions, corrosion control, and third-party activity near the rights-of-way;

- Non-destructive testing at targeted investigation sites; and

- Regularly scheduled equipment maintenance and monitoring.

Additionally Enbridge supports and funds research, development, and testing of new tools that advance pipeline monitoring capabilities.

These tools are commonly used throughout the industry with a great deal of success in identifying integrity anomalies. Together, these extremely sensitive tool sensors work to inspect the pipeline, using calipers (to measure geometry), gyroscopes (to gauge pipe movement), GPS (for precise pipe position), and ultrasonic or magnetic flux (to measure associated gouge, corrosion, and cracking). The in-line inspection tools Enbridge uses to inspect its pipelines are extremely sensitive and measure the size, frequency and location of minute changes on both the inside and the outside of pipe walls, providing a level of detail similar to that provided by an MRI, ultrasound, or x-ray screening in the medical industry.

Once gathered, the data from each in-line inspection run is analyzed by internal Enbridge and external engineering and integrity experts.

Data analysis requires the significant expertise of engineers and integrity specialists to review the millions of pieces of data collected through the tool runs. Once the data is collected and analyzed, Enbridge then reviews the analysis to develop an integrity management plan to address the anomalies that have been identified.

Integrity Threat Mitigation – Dig and Repair

Enbridge employs a broad range of mitigation measures or activities including, but not limited to, integrity monitoring activities, operating a state of the art control center with highly qualified and trained personnel to respond in the event of a trigger alerting them that there has been a change in volume or operations of a line; reducing operating pressure; undertaking a dig and repair; or replacing the line.

The Project pipeline and ancillary facilities will be constructed to accommodate internal inspection instruments, such as in-line inspection devices also referred to as "smart pigs" to identify "features" that may be areas of internal corrosion, dents, cracks, or other features that could compromise pipeline integrity. Such inspections are required periodically under PHMSA's regulations at 49 CFR Part 195.

Specifically, Part 195 requires that an operator must continually assess a pipeline's integrity at five-year intervals, not to exceed 68 months. Because there are multiple in-line inspection technologies used to detect various types of possible pipeline features, that often means that a variation of tools are run more frequently over a five-year period to assess varying feature types. In addition, Enbridge assesses certain features via a risk-based approach that may require multiple tool runs over a five-year period. Part 195 requires a baseline assessment prior to operation.

4.8.2 Valve Placement

The placement of valves on the Project will help mitigate the risk of discharge. Enbridge conducts Intelligent Valve Placement ("IVP") studies for proposed Projects. The IVP identifies optimal valve locations that will protect major water crossings and high consequence areas in the event of a pipeline release. PHMSA regulations require placement of valves in certain proximity to a water crossing. See 49 CFR § 195.260 (a valve must be installed on each side of a water crossing that is more than 100 feet wide from high-water mark to high-water mark). The IVP study also considers:

- Locations that will reduce the potential consequence of a release;
- Construction limitations;
- Pump station locations;
- Presence of potential High Consequence Area as defined by PHMSA;
- Proximity to densely populated areas;
- Accessibility;
- Operational considerations; and
- Future pipeline expansion potential.

In the event of a release from the pipeline, Enbridge can remotely close these valves from its control center, thereby mitigating the impact of any release. The number and final location of valves will be identified pending the results of the IVP analysis.

4.8.3 Leak Detection

In accordance with PHMSA regulations and industry standards, Enbridge has a number of leak detection capabilities. In compliance with PHMSA requirements set forth in 49 CFR Part 195.402, Enbridge has procedures for handling abnormal operating conditions and emergencies.

In accordance with 49 CFR Part 195.402, Enbridge monitors its liquid petroleum pipelines 24 hours a day using four primary methods, each having a different focus and featuring different technology, resources, and timing. Used together, those methods provide an overlapping and comprehensive leak detection capability. PHMSA inspects each of the methods for compliance with Integrity Management Rules for Pipelines in high consequence areas, as per regulatory requirements set forth at 49 CFR Part 195. Such methods include the following:

- Controller monitoring - Enbridge's pipeline controller monitors pipeline conditions (such as pipeline pressure) through its Supervisory Control and Data Acquisition ("SCADA") system. The SCADA system identifies unexpected operational changes, such as pressure drops outside normal variations that may indicate a release. The controller also utilizes additional sensors at pumping stations monitored through SCADA to identify potential leaks.

- Computational Pipeline Monitoring - Computer-based pipeline monitoring systems utilize measurements and pipeline data to detect abnormal operating conditions, such as pressures that are above or below pre-established limits that could indicate possible releases. The pipeline monitoring system that Enbridge uses provides a sophisticated computer model of its pipelines, and continuously monitors changes in their calculated volume of liquids. The pipeline will employ two computational pipeline-monitoring systems.

- The primary Computational Pipeline Monitoring system ("CPM") for the Project will be a Material Balance System and is a hydraulic-based, real-time transient model. The software calculates material balance and displays alarms when imbalances exceed pre-specified thresholds. The software performs material balance calculations on individual flow meter–to–flow meter sections, as well as overlapping flow meter–to–flow meter sections. The sensitivity of the CPM system depends on the quantity, repeatability, quality, and accuracy of various types of instrumentation on the pipeline.

- Enbridge will also utilize a secondary, statistical-based CPM system as part of the Project. The statistical CPM system works by applying a sequential probability ratio test to the corrected flow balance system after a comprehensive data validation process. The system continuously calculates the statistical probability of a release based on fluid flow and pressure measured at remote valve locations and the inlets and outlets of a pipeline. In addition, pattern recognition techniques are used to identify changes in the relationship between the pipeline pressure and flow when a release occurs. This CPM can detect the location of releases and improves release detection capability under transient conditions.

- Scheduled line balance calculations - These are calculations of oil inventory in operational pipelines that Enbridge conducts at fixed intervals, typically every 2 and 24 hours. Enbridge also maintains a rolling 24-hour calculation based on the calculations done at the prescribed set times. The calculations identify unexpected losses of pipeline inventory during pipeline flow conditions that may indicate a possible release.

- Visual surveillance and reports - These are reports of oil or oil odors from third parties and from Enbridge's aerial and ground line patrols. Enbridge handles third-party reports through an emergency telephone line. Enbridge typically conducts aerial line patrols every two weeks per PHMSA requirements. It also may conduct an additional focused aerial and ground patrol upon review of the status of a pipeline. Enbridge has an extensive public awareness program, which facilitates communication with those who live along the pipeline route, including public officials, excavators, and emergency responders. As part of that public awareness program, Enbridge provides information on how to recognize, react, and report abnormal conditions or observations that could be the result of an oil release.

Further, Enbridge's Control Center has a protocol for addressing abnormal operating conditions, which consists of notifying local emergency responders to respond to the site of a suspected release. Emergency response timing is typically 60 minutes or less, but dependent on final routing and location of a potential incident along the pipeline route. Enbridge can supplement the initial response with personnel from other Enbridge locations and contract resources as necessary.

4.8.4 Emergency Response

PHMSA regulations to which Enbridge is subject, set forth in 49 CFR Part 194, provide standards and guidelines for preparing emergency response plans, including the listing of resources and capabilities of responding to a potential incident. Enbridge must submit the plans to PHMSA for review and approval.

Enbridge has an Integrated Contingency Plans ("ICP") that serves as the emergency response plan for Enbridge's pipelines. PHMSA approved Enbridge's current ICP in January 2018. The ICP follows an industry-recognized format for response planning, which the National Response Team developed as a means by which to consolidate multiple facility response plans. The U.S. Environmental Protection Agency ("USEPA"), U.S. Coast Guard, and the Occupational Safety and Health Administration, among other agencies, all provided input into the ICP format. Those federal agencies agreed that the ICP, when prepared in accordance with that guidance, will be the preferred method of response planning and documentation (refer to National Response Team ICP Guidance, at 61 Fed. Reg. 28642 [5 June 1996]).

Enbridge's ICP has undergone an extensive, multiagency review process, which included participation by the USEPA. The ICP addresses the gaps identified in the National Transportation Safety Board report on the Line 6B incident, and strengthens Enbridge's emergency response capabilities to any incident that might occur on Enbridge's pipelines. The "Core Plan" serves as the primary response tool within the ICP and is supported by additional Annexes specific to geographical Response Zones and/or specific sites. Enbridge reviews the ICP annually to reflect operational or regulatory changes when required. Enbridge will request approval for the ICP from PHMSA, as necessary, in order for the ICP to apply to the Project.

In addition to the operational changes noted above, Enbridge has also implemented changes to its Pipeline Public Awareness and Emergency Response Programs by:

- Offering online and in-person training tools to provide Enbridge-specific information to emergency responders in its host communities;

- Adding Community Relations positions in key locations along Enbridge liquid pipeline routes;

- Improving programs, equipment and capabilities, developing better tools to deal with particular waterborne spills, and improved training programs;

- Implementing specialized training for a cross-business unit response team to respond to large-scale events anywhere in North America that will require more resources than a single Enbridge liquid pipeline operating region or business unit could provide;

- Conducting an emergency response preparedness assessment to identify additional strategic equipment purchases to enhance capabilities to more rapidly respond and contain a significant release anywhere in the Enbridge system;

- Adding personnel in each Enbridge liquid pipeline operating region to improve emergency preparedness planning and coordination; and

- Creating a website containing safety information for emergency response organizations, including emergency response action plans, emergency contact numbers, and other resources.

Enbridge contracts with a full-service environmental and emergency response company and a classified Oil Spill Response Organization to supplement Enbridge's own resources located at designated terminals, pumping stations and pipeline maintenance facilities along the existing pipeline system. Those companies are located in many areas throughout the United States and maintain Response Teams equipped to respond quickly to emergencies upon notification.

Enbridge also provides Safety Data Sheet information to local responders in accordance with PHMSA requirements.

5 EXISTING ENVIRONMENT

Section 5 describes the current conditions of the environment in the Project Area. For each resource, a description of the current environmental setting is provided based on publicly available data.

5.1 AIR QUALITY AND NOISE

5.1.1 Air Quality

Ashland, Bayfield, Douglas, and Iron Counties have a typically continental climate with some modification due to proximity to Lake Superior. In Ashland County, average temperatures range from a low of 1 degree Fahrenheit (°F) in January to a high of 80°F in July, with a long-term annual average of 41°F. Ashland County receives an average annual precipitation in rainfall of 30.8 inches (U.S. Climate Data 2019a). In Bayfield County, average temperatures range from a low of 3°F in January to a high of 77°F in July, with a long-term annual average of 41°F. Bayfield County receives an average annual precipitation in rainfall of 33.5 inches (U.S. Climate Data 2019b). In Douglas County, average temperatures range from a low of 5°F in January to a high of 75°F in July, with a long-term annual average of 41°F. Douglas County receives an average annual precipitation in rainfall of 30.7 inches (U.S. Climate Data 2019d). In Iron County, average temperatures range from a low of 3°F in January to a high of 77°F in July, with a long-term annual average of 41°F. Iron County receives an average annual precipitation in rainfall of 36.11 inches (U.S. Climate Data 2019c).

Federal and state regulations protect ambient air quality. Under the Clean Air Act ("CAA") and its amendments, the USEPA established National Ambient Air Quality Standards ("NAAQS") for carbon

monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone, particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and sulfur dioxide (SO_2), to protect human health (primary standards) and public welfare (secondary standards). Individual states may set air quality standards that are at least as stringent as the NAAQS. The state of Wisconsin adopted the NAAQS in Chapter NR 404 of the Wisconsin Administrative Code, effective 1 December 2011. Table 5.1.1-1 includes a summary of the NAAQS.

Table 5.1.1-1: National Ambient Air Quality Standards (NAAQS) 40 CFR 50 and WI Administrative Code NR 404.04

Pollutant	Averaging Period	Primary Standard [1]		Secondary Standard [2]		Averaging Period
		ppmv	µg/m³	ppmv	µg/m³	
CO	1-hour	35	--	--	--	Not-To-Exceed (NTE) more than once annually
	8-hour	9	--	--	--	
Lead	3-month	--	0.15	--	0.15	NTE
NO2	1-hour	0.1	188	--	--	98th % of 1-hour daily max; avg. over 3 years
	annual	0.053	100	0.053	100	Annual Mean
O3	8-hour	0.070	--	0.070	--	Annual 4th-highest daily max 8-hr; avg. over 3 years
PM10	24-hour	--	150	--	150	NTE more than once annually; avg. over 3 years
PM2.5	annual	--	12	--	15	Annual mean, avg. over 3 years
	24-hour		35		35	98%, avg. over 3 years
SO2	1-hour	0.075	--	--	--	99% of 1-hour daily max, avg. over 3 years
	3-hour	--	--	0.5	--	NTE more than once annually

Notes:

[1] Primary standards are set to protect human health.

[2] Secondary standards are set to protect public welfare, including animals, crops, visibility, and structures.

The USEPA, state, and local agencies established a network of ambient air quality monitoring stations to measure and track the background concentrations of criteria pollutants across the United States. The regulatory agencies then use this data to compare the air quality of an area to the NAAQS. To characterize the background air quality in the region surrounding the Project, Enbridge obtained data from representative air quality monitoring stations in northern Wisconsin and northeastern Minnesota close to and representative of the Project area. Table 5.1.1-2 provides a summary of the regional ambient air quality monitoring data for the Project area from the period of November 2016 to November 2019 based on the individual pollutant concentration measurement requirements described in Table 5.1.1-1 (WDNR 2019r; Minnesota Pollution Control Agency 2019).

Table 5.1.1-2: Ambient Air Quality Concentrations

Pollutant	Averaging Period	Monitor [a]	Reading	Value	Year	Approximate Distance
CO	1-hour	No data available				
	8-hour	No data available				
NO_2	annual	No data available				
	1-hour	No data available				
O_3	8-hour	C	Annual 4th-highest daily max 8-hr; avg. over 3 years	0.057 ppm*	2018-2019	12 miles east of project start point
$PM_{2.5}$	24-hour	C	98th percentile of 24-hour concentration, 3 year average	20.6 µg/m³ *	2018-2019	12 miles east of project start point
	annual	C	annual arithmetic mean	5.2 µg/m³ *	2018-2019	12 miles east of project start point
PM_{10}	24-hour	A	NTE more than once annually; avg. over 3 years	0 exceedance days	2016-2018	60 miles west of project start point
SO_2	1-hour	D	99th percentile of the daily maximum 1-hour average	0.038 ppm	2016-2019	76 miles southeast of project endpoint
	3-hour	No data available				
Pb	3 month	B	maximum arithmetic mean	0.01 µg/m³	2016-2019	60 miles west of project start point

[a] A: MN AQS Site ID: 27-137-0032. Located at 37th Ave W and Oneota St, Duluth, MN.
B: MN AQS Site ID: 27-137-7555. Located at Industrial Road, Duluth, MN
C: WI AIRS ID: 55-003-0010. Located at Bad River Tribal School, Odanah, WI.
D: WI AIRS ID: 55-085-0996. Located at 434 High St, Rhinelander, WI.
*Based upon a recent installation date, only two years of data is available for this monitor,

Air Quality Control Regions ("AQCRs") are intrastate and interstate regions, such as large metropolitan areas, where the improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. The USEPA designates each AQCR, or portion thereof, as attainment, unclassifiable, maintenance, or nonattainment for each pollutant. Designated attainment areas include those locations where an ambient air pollutant concentration is below the applicable ambient air quality standard. Areas where no data are available are unclassifiable and treated as attainment areas for permitting a stationary source. Nonattainment areas include locations where the ambient air concentration is greater than the applicable ambient air quality standard. Maintenance areas include locations previously designated nonattainment but since demonstrated compliance with the ambient air quality standard(s) for that pollutant.

According to EPA Green Book, the Project area, Ashland County, Bayfield County, Douglas County, and Iron County, are designated attainment or unclassifiable for all criteria pollutants (USEPA 2019).

Greenhouse Gases

In April 2007, the United States Supreme Court ruled that greenhouse gases ("GHGs"), gases that trap heat in the atmosphere and contribute to climate change, fall within the CAA's definition of "air pollutant," and required the EPA to conduct an endangerment finding for GHGs. On 7 December 2009, the USEPA expanded their definition of air pollution to include six GHGs, finding that the presence of the following GHGs in at the atmosphere endangers public health and public welfare currently and in the future: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. GHG emissions are estimated as carbon dioxide equivalents. Carbon dioxide equivalent emissions are calculated

by determining the GHG's global warming potential of the gases relative to carbon dioxide based on the properties of a GHG's ability to absorb solar radiation, as well as its residence time in the atmosphere.

5.1.2 Noise

The Noise Control Act (42 U.S. Code 4901-4918) initially was implemented through regulations issued by the USEPA in the early 1980s; however, the primary responsibility for regulating noise has been delegated to state and local governments. Noise is generally defined as unwanted sound. Sound is most commonly measured in decibels ("dB") on the A-weighted scale, which is the scale most similar to the range of sounds audible to the human ear. The Day-Night Average Sound Level ("DNL") is an average measure of sound. The DNL descriptor is accepted by federal agencies as a standard for estimating sound impacts and establishing guidelines for compatible land uses. USEPA guidelines, and those of many other federal agencies, state that outdoor sound levels in excess of 55 dB DNL are "normally unacceptable" for noise-sensitive land uses such as residences, schools, or hospitals.

The State of Wisconsin does not have noise ordinances applicable to the Project, with the exception of general vehicle muffler requirements outlined in Wisconsin Statutes Chapter 347.39. Per the Ashland County Noise Ordinance (O05-2017-94), the county prohibits construction activities between 10:00 pm and 6:00 am. In addition, the City of Ashland Noise Ordinance (Chapter 202) prohibits construction activities in any residential or commercial district between 9:00 pm and 6:00 am and may specify sound level restrictions for construction activities in industrial districts within an applicable building permit. No other county, township, or city noise ordinances were identified for the Project.

5.2 SOILS

5.2.1 Background and Methodology

Enbridge identified and assessed detailed soil characteristics along the route using the Soil Survey Geographic Database ("SSURGO") (Soil Survey Staff 2019) for Ashland and Iron Counties, Wisconsin. The SSURGO database is a digital version of the original county soil surveys developed by NRCS for use with GIS. It provides the most detailed level of soils information for natural resource planning and management.

SSURGO attribute data consists of physical properties, chemical properties, and interpretive groupings. Attribute data applies to the whole soil (e.g., listed hydric, prime farmland soils, or slope class), as well as to layer data for soil horizons (e.g., texture or permeability). The soil attribute data can be used in conjunction with spatial data to describe the soils in a particular area.

5.2.2 Identification of Soil Conditions

At the broadest scale, soil interpretations in the United States are based on Major Land Resource Areas ("MLRAs"). The Project will cross two MLRAs: the Superior Lake Plain MLRA and the Superior Stony and Rocky Loamy Plains and Hills, Eastern Part MLRA. The Superior Lake Plain MLRA consists of till plains mixed with lake plains, lake terraces, beaches, flood plains, swamps, and marshes. Some rocky knobs, hills, and low mountains are also present within this MLRA. The dominant soil types in this area are Alfisols, Spodosols, Inceptisols, and Entisols. Soils in this MLRA largely consist of clayey lacustrine soils and have a frigid soil temperature regime, an udic or aquic soil moisture regime, and mixed orisotic mineralogy. The Superior Stony and Rocky Loamy Plains and Hills, Eastern Part MLRA consist of many glacial landscape features and numerous streams and rivers. A mixture of high-relief bedrock-controlled moraines, end moraine, and ground moraines and nearly level areas of glaciofluvial deposits characterize

this MLRA. The dominate soil orders in this MLRA are Histosols and Spodosols. The soils in this MLRA dominantly have a frigid soil temperature regime, an aquic or udic soil moisture regime, and mixed or isotic mineralogy (NRCS 2006).

The Project workspace crosses approximately 60 soil series. The dominant soil series affected by the Project is the Gogeic series (approximately 25 percent of the Project area). Gogebic soils are very deep, moderately well drained soils formed in modified loamy eolian deposits and the underlying loamy and sandy glacial till on end moraines. Slopes range from 1 to 55 percent. These soils are shallow or moderately deep to a fragipan. Rock fragments in the series average more than 10 percent.

5.3 GEOLOGY AND GROUNDWATER

5.3.1 Geology

The U.S. Geological Survey ("USGS") defines geologic provinces within the United States. The Project lies in the Superior Upland Province. The basement rocks of this province are associated with the 2.5-billion-year-old Kenoran Orogeny, a mountain-building event, and are part of the Canadian Shield (USGS 2014a). The Project is also within Wisconsin's Lake Superior Lowlands geologic province, which is characterized by nearly level lacustrine plains. The elevation range in this area is between approximately 600 and 1400 feet above mean sea level (USGS 2018). The topography in the Project area consists of low plains gently sloping northward and subdued hills (Clayton 1984). The National Seismic Hazard Maps indicate the Project area as having the lowest seismic hazard (USGS 2014b).

Bedrock below the Project is mostly comprised of the pre-Cambrian Keweenawan feldspathic sandstone, siltstone, shale, and conglomerate overlying Keweenawan basalt flows (Mudrey et al. 1982). Unconsolidated deposits from the Pleistocene continental glaciation processes characterize the surficial geology along the proposed Project route. Clayey glacial and offshore sediments deposited largely within a pro-glacial lake formed during one or more episodes of glacial retreat typify unconsolidated deposits of the Lake Superior Lowlands (WDNR 2015). The depth to bedrock in the Project area is between 5 and greater than 100 feet from the land surface (WDNR 2019e).

5.3.2 Groundwater

According to the WDNR, the depth-to-water table for much of the Project region is between 0 and 50 feet from the surface, with a small section of the northeast portion of the route having a depth-to-water table of over 50 feet from the surface (WDNR 2019f). There is one USGS groundwater monitoring well within approximately 30 miles of the Project area (USGS 2019a). Based on field groundwater-level measurements between 2011 and 2019, the average depth to ground water is approximately 30 feet from the surface (USGS 2019b).

5.4 SURFACE WATERS AND WETLANDS

5.4.1 Surface Waters

The Project route crosses the Lake Superior Major Basin located in Ashland, Bayfield, and Iron Counties, Wisconsin. Within the Lake Superior Major Basin, wetland and waterbody crossings are further located within the Superior Coastal Plain Ecological Landscape of the WDNR watersheds including Fish Creek, Lower Bad River, White River, Marengo River, Upper Bad River, Tyler Forks, Potato River, and Montreal River (refer to Figure 5.4.1-1).

Lake Superior is the largest freshwater body in the world, covering an area of 31,700 square miles, and is third largest by volume. Lake Superior is the coldest (average temperature is 40°F) and deepest (maximum depth of 1,332 feet) of all the Great Lakes. Much of the land within the Lake Superior Major Basin is forested, with very little agriculture due to the cool climate and poor soils. Streams within the basin flow to Lake Superior, which discharges into Lake Huron, and ultimately flows into the St. Lawrence Seaway via Lakes Erie and Ontario (WDNR 2015).

Many streams in the eastern portion (Ashland and Iron counties) of the Superior Coastal Plain Ecological Landscape generally begin in or north of either the Superior escarpment or the Penokee-Gogebic Range. Stream flow in this area is predominantly influenced by surface water runoff, with groundwater only able to sustain the cold temperatures suitable for species such as brook trout in the upstream reaches. Several of these surface waters have cut through the red clay deposits and reached the underlying bedrock forming waterfalls, such as Copper Falls on the Bad River (WDNR 2015). The proposed Project route will cross the Bad River at milepost ("MP") 24.0, located adjacent and just south, however outside of the southern extent of Copper Falls State Park.

In the western lobe of the North Central Forest Ecological Landscape, high-gradient, cold headwater streams originate in the Penokee Range of Bayfield, Ashland, and Iron counties. These include Tyler Forks, Spring Brook, and the headwaters of the Bad and Potato rivers. These streams flow into major rivers such as the Bad, Marengo, and Montreal, which in turn flow into Lake Superior (WDNR 2015).

Unprotected components of the landscape are particularly susceptible to erosion in the poorly drained uplands and in more steeply sloping areas near the major rivers. Sediment movement into the rivers and streams is an issue on the red clay plain. There are few natural lakes found in the ecological landscape. Drainages are indistinct and integrated drainage is dependent to a large degree on rainstorm and/or snowmelt intensity. More intense runoff events will fill receiving depressions until they progressively overflow and ultimately drain to more integrated drainageways.

Three primary waterbody types occur in the Project area: perennial, intermittent, and ephemeral stream. A perennial stream has flowing water year round during a typical year. The water table is located above the streambed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow. The substrate consists of different mediums, or combinations thereof, such as clay, silt, gravel, or sand. These waterbodies are generally direct tributaries that lead to the primary watershed drainage outlets.

An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow. When the water is not flowing, it may remain in isolated pools or surface water may be absent. The substrate consists of different mediums, or combinations thereof, such as clay, silt, gravel, or sand (Cowardin et al. 1979). These waterbodies are generally second or third order streams.

An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral streambeds are located above the water table year round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

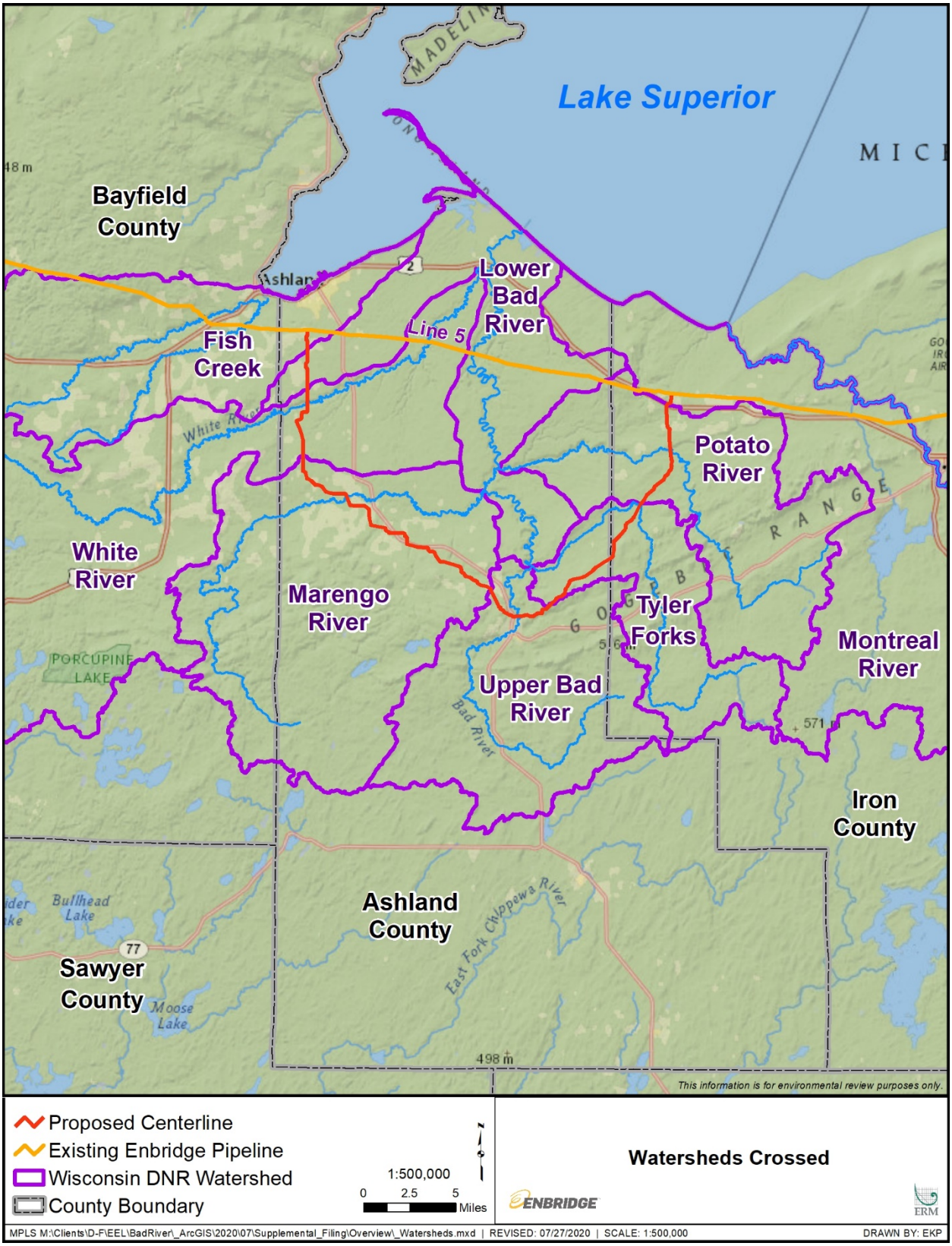

Figure 5.4.1-1: Overview of Watersheds within the Project Area

Many streams in the Lake Superior clay plain have "flashy" flow regimes; water levels rise rapidly after precipitation because of the impermeable soils in the watershed. Sand layers within the soils of the clay plain can create unstable bluffs along streambanks and roadsides. The power from high and rapidly changing flows carves at streambanks and leads to slumping of sand and clay into the stream. Streams in the Lake Superior clay plain are often turbid with suspended clay particles that remain in suspension and often form plumes in Lake Superior. Maintenance of forest cover and wetlands within the watershed help to ameliorate rapid runoff from the watershed and reduce stream flashiness that leads to streambank erosion and subsequent aquatic habitat degradation.

The Project crosses the drainage of watersheds with streams originating in the North Central Forest ecological landscape with geological and soil characteristics that are different from those of the Superior Coastal Plain. Therefore, the stream may start out relatively clear before picking up sediments and the reddish tints from the thick layer of red, lacustrine clays characteristic of the Superior Coastal Plain.

Sensitive or Protected Waterbodies

The WDNR developed special designations for sensitive or protected waterbodies as follows:

- Areas of Special Natural Resource Interest—Includes trout streams; outstanding or exceptional resource waters; waters inhabited by endangered, threatened, or species of special concern; wild and scenic rivers; and more.

- Public Rights Features ("PRF")—Waterbodies with sensitive areas, such as fish and wildlife habitat necessary for breeding, nesting, nursery, and feeding, as well as physical features that ensure protection of water quality; areas navigated by recreational watercraft used in such activities as boating, angling, hunting, or enjoying natural beauty.

- Priority Navigable Waters—A navigable waterway (or a portion of one) that is identified as either an outstanding or exceptional resource water, a trout stream, a lake that is less than 50 acres in size, or waters that the WDNR determined contain sensitive fish and aquatic habitat. This category can also include waterbodies classified as ASNRI and PRF.

Impaired Waters

Every two years, Section 303(d) of the Clean Water Act requires states to publish a list of all waters that do not meet water quality standards. The list, also known as the Impaired Waters List, is updated to reflect waters that are newly added or removed based on new information or changes in water quality status. The 2020 assessment of impaired waters has not been approved by the U.S. Environmental Protection Agency; therefore, Enbridge reviewed Wisconsin's 2018 Impaired Waters List approved by the U.S. Environmental Protection Agency on 2 August 2018. Three waterbodies crossed by the proposed Project are listed (WDNR 2019w; WDNR 2020):

- Bay City Creek - Total Phosphorus;
- Marengo River – Fecal Coliform; and
- Trout Brook – Fecal Coliform.

5.4.2 Wetlands

Wetlands are abundant within the Superior Coastal Plain, covering approximately 12 percent of the land surface area. Of the total wetland acreage, approximately 61 percent are forested, 33 percent are shrub, and

only 5 percent are herb dominated (WDNR 2015). Similarly within the North Central Forest, wetlands cover approximately 23 percent of the land area, with forested wetlands accounting for 59 percent, 30 percent shrub wetland, and less than 5 percent as emergent/wet meadow (a broad category that encompasses marsh, sedge meadow, bog, and fen communities), (WDNR 2015). The proposed Project route crosses approximately 30.46 miles of Ashland County and 10.64 miles of Iron County in Wisconsin.

The clay plain is rich in wetlands, in part due to the impermeable clay soils and relatively flat topography. Hydrological disruption, agriculture, and past logging have disturbed many local wetlands even though they are abundant. The Project area includes shrub swamps and wet meadows commonly interspersed with agricultural, residential, and industrial land uses. The clay plain includes deeply incised streams within steep ravines, formed through the erosive power of rapid water runoff from the surrounding landscape (WDNR 2015).

Wetlands in the Project area are numerous, with drainage to the north and south toward the flanks of the elevated lake plain. Unprotected components of the landscape are particularly susceptible to sheet and rill erosion in the poorly drained uplands and gully erosion in more steeply sloping areas near the major rivers.

Emergent wetlands within the Project area typically includes vegetation species such as sedges, Canada bluejoint grass (*Calamagrostis canadensis*), orange jewelweed (*Impatiens capensis*), asters (*Asteraceae* spp.), boneset (*Eupatorium perfoliatum*), rough bedstraw (*Galium asprellum*), marsh fern (*Thelypteris palustris*), arrow-leaved tearthumb (*Persicaria sagittata*), and sensitive fern (*Onoclea sensibilis*). Palustrine scrub-shrub wetlands in the Project area typically include speckled alder, red-osier dogwood, willows, and several minor shrub components. Widely scattered small, ephemeral pools support a variety of emergent hydrophytes. The forested wetlands in this segment are primarily (1) black ash (*Fraxinus nigra*) dominated depressions within the hardwood uplands along the route, (2) discrete aspen groves within shrub-carr, and (3) isolated hardwoods and conifers in better drained areas adjacent to incised drainageways. Black ash also occurs as a fringe or minor component to larger wetland complexes or as isolated stunted specimens within some wetlands.

Surface runoff feeds the majority of the wetland systems. Most depressions are ponded very early in the year and immediately after heavy precipitation events. A complex net of subtle, poorly integrated drainages characterize the area. These drainageways are typically ephemeral in nature and dependent upon precipitation intensity for flow. The elevated areas dominated by Cuttre and Amnicon soils between depressions are very rarely or never ponded.

Wetlands provide an important flood protection function. In the Lake Superior clay plain, many of the wetlands are topography-dependent and highly interspersed on the landscape. Wetlands hold water on the landscape, which slows the rate of water runoff to the streams. This wetland function is particularly important in the Lake Superior clay plain watersheds where water runs off the impermeable clay soils very quickly. Wetland loss causes increased runoff from the landscape, which in turn increases flooding and streambank erosion. For streams in the clay plain, the streambank erosion caused by excess water runoff leads to habitat degradation from sedimentation.

Table 5.4.2-1 provides wetland crossing length of the Project through the associated watersheds.

Table 5.4.2-1: Wetland Classification Crossed by the Project by Watershed

		WWI Watershed Name						
Wetland Classification	**Unit**	**Fish Creek**	**Lower Bad River**	**White River**	**Marengo River**	**Upper Bad River**	**Tyler Forks**	**Potato River**
NWI - PEM	Miles	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	0.1

Wetland Classification	Unit	WWI Watershed Name: Fish Creek	Lower Bad River	White River	Marengo River	Upper Bad River	Tyler Forks	Potato River
	Acres	0.1	0.2	0.3	0.3	0.3	0.5	0.6
NWI - PSS	Miles	0.0	N/A	N/A	0.1	N/A	N/A	0.0
	Acres	0.5	N/A	N/A	1.7	N/A	N/A	0.2
NWI - PFO	Miles	0.1	<0.1	N/A	0.3	0.1	0.6	0.5
	Acres	1.4	0.6	N/A	4.8	1.7	12.6	6.6
NWI Total by Watershed	**Miles**	**0.1**	**<0.1**	**<0.1**	**0.4**	**0.1**	**0.6**	**0.6**
	Acres	**2.0**	**0.8**	**0.3**	**6.8**	**2.0**	**13.1**	**7.4**
WWI - emergent/wet meadow	Miles	0.1	0.0	N/A	0.1	0.0	<0.1	<0.1
	Acres	0.9	0.2	N/A	0.6	<0.1	0.3	0.2
WWI - scrub/shrub	Miles	N/A	0.0	<0.1	0.1	N/A	<0.1	0.0
	Acres	N/A	0.1	0.3	1.6	N/A	1.0	<0.1
WWI - forested	Miles	N/A	0.0	0.3	1.0	0.3	0.6	1.3
	Acres	2.2	1.2	3.2	11.5	2.6	14.9	16.9
WWI Total by Watershed	**Miles**	**0.1**	**0.0**	**0.3**	**1.2**	**0.3**	**0.6**	**1.3**
	Acres	**3.1**	**1.5**	**3.5**	**13.7**	**2.6**	**16.2**	**17.1**

Notes:
WDNR 2019s
PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested; N/A = not applicable;
NWI = National Wetlands Inventory; WWI = Wisconsin Wetland Inventory

5.5 VEGETATION, WILDLIFE, AND FISHERIES

5.5.1 Existing Vegetation Resources

Based on Wisconsin's Ecological Landscapes (WDNR 2012), the majority of the Project is within the Superior Coastal Plain, with a portion of the Project crossing through the North Central Forest.

Superior Coastal Plain

The Superior Coastal Plain is a nearly level plain of lacustrine clay that slopes gently northward toward Lake Superior. The Superior Coastal Plain was originally dominated by white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), and white pine (*Pinus strobus*). Mesic to dry-mesic forests of northern hardwoods or hemlock hardwoods were more prevalent on the glacial tills of the Bayfield Peninsula and throughout the Apostle Islands. Large peatlands occurred along the Lake Superior shoreline, often associated with drowned river mouths and well-developed sand spits. The most extensive of these wetland complexes were on the Bad and St. Louis Rivers. A few large peatlands also occurred at inland sites, such as Bibon Swamp, in the upper White River drainage, and Sultz Swamp on the northern Bayfield Peninsula.

Forests of aspen (*Populus* spp.) and birch (*Betula* spp.) currently occupy approximately 40 percent of the Superior Coastal Plain, having increased in prominence over the boreal conifers. Approximately 30 percent of the Superior Coastal Plain is currently non-forested. Most of the open land is in grass cover, having been cleared and then pastured or plowed (WDNR 2005). Important land uses in the Superior Coastal Plain

today include forestry, tourism, and agriculture, including specialty crops, such as apples and cherries (WDNR 2012).

Within the Superior Coastal Plain, the Project passes through a Landtype Association known as the Douglas Lake-Modified Till Plain, characterized by undulating modified lacustrine moraines with deep v-shaped ravines and clay soils. Common habitat types in the Douglas Lake-Modified Till Plain include associations of balsam fir, red maple (*Acer rubrum*), and black snakeroot (*Sanicula marilandica*); associations of balsam fir, maple (*Acer* spp.), black snakeroot, and partridgeberry (*Mitchella repens*); and forested lowlands (WDNR 2012).

North Central Forest

The North Central Forest is characterized by end and ground moraines, with widespread kettle depressions and bedrock-controlled ridges in the northern portion of this landscape. Streams and rivers are widespread throughout this ecological landscape. Historically, the Northern Central Forest was dominated by mesic hemlock-hardwood forest, with eastern hemlock (*Tsuga canadensis*), sugar maple (*Acer saccharum*), and yellow birch (*Betula alleghaniensis*) being the most prevalent species. However, harvesting eastern hemlock for the tanning industry changed the forest composition drastically, and this species became a minor component of the forests due to overharvesting and lack of regeneration. Today, the North Central Forest is comprised of approximately 75 percent forest. Mesic northern hardwood forest remains the dominant forest type; however, the dominant tree species within this forest type has shifted to include sugar maple, American basswood (*Tilia americana*), and red maple (*Acer rubrum*). Other forest types found within this landscape include aspen-birch forests and spruce-fir forests. Forested and non-forested wetland communities are found throughout this landscape, including Northern Wet-mesic forest, characterized by white cedar or black ash; Northern Wet Forest, characterized by black spruce and/or tamarack; and non-forested acid peatlands, such as bogs, fens, and muskegs (WDNR 2015). Important land uses in the North Central Forest today include forestry, tourism, retail trade, and manufacturing (WDNR 2015).

Within the North Central Forest, the Project passes through a Landtype Association known as the Penokee/Gogebic Iron Range, which is characterized by hilly bedrock-controlled moraines and well-drained sandy loam soils. Common habitat types in the Penokee/Gogebic Iron Range include associations of sugar maple-eastern hemlock and wild lily-of-the-valley (*Maianthemum canadense*); associations of sugar maple-eastern hemlock and spinulose shield fern (*Dryopteris spinulosa*); and forested lowlands (WDNR 2015).

Natural Communities

Natural Communities are communities the WDNR deems significant for reasons such as undisturbed condition or community extent. Although endangered species laws do not protect these communities, their preservation helps protect valuable areas of genetic and biological diversity and important habitats for many of Wisconsin's rare species. Based on NHI review, there is one terrestrial Natural Community (Boreal Forest) within 1 mile of the Project, and two aquatic Natural Communities (Ephemeral Pond and Stream – slow, hard, cold) within 2 miles of the Project.

In Wisconsin, the boreal forest is a transitional community between the mixed deciduous-coniferous forests to the south and the spruce-fir dominated forests of Canada, so tree species richness is often greater in this community. White spruce and balsam fir dominate mature stands of this upland forest community. Most Wisconsin stands are associated with the Great Lakes, especially the clay plain of Lake Superior (Epstein et al. 2002).

Ephemeral ponds are depressions with impeded drainage (usually in forest landscapes), that hold water following snowmelt but typically dry out by midsummer. Common aquatic plants of these habitats include yellow water crowfoot (*Ranunculus flabellaris*), mermaid weed (*Proserpinaca palustris*), Canada bluejoint grass, floating manna grass (*Glyceria septentrionalis*), spotted cowbane (*Cicuta maculata*), smartweeds (*Polygonum* spp.), orange jewelweed, and sedges (Epstein et al. 2002). "Stream – slow, hard, cold" is a coldwater stream community, and is further discussed under section 5.5.3.

Copper Falls Area of Special Natural Resource Interest

The Project is within 140 feet of the southernmost boundary of the Copper Falls Area of Special Natural Resource Interest, which is located within the Copper Falls State Park. In 2003, the WDNR identified the Copper Falls complex as a State Natural Area ("SNA"). As an SNA, the Copper Falls SNA is also an ASNRI.

Copper Falls SNA is comprised of a northern dry and dry-mesic forest community located along the Bad River. The SNA is characterized by a sugar maple-hemlock forest, which has remained undisturbed since at least 1916. Common bird species include American redstart (*Setophaga ruticilla*), blackburnian (*Setophaga fusca*), black-and-white (*Mniotilta varia*), Nashville (*Leiothlypis ruficapilla*), northern parula (*Setophaga americana*), and Canada warblers (*Cardellina canadensis*); ovenbird (*Seiurus aurocapilla*); blue-headed vireo (*Vireo solitarius*); hermit thrush (*Catharus guttatus*); and common raven (*Corvus corax*) (WDNR 2019u).

5.5.2 Wildlife

Table 5.5.2-1 identifies the common wildlife resources potentially located within the region based on the habitat descriptions and geographic distributions from WDNR (1997).

Table 5.5.2-1: Common Wildlife Resources Potentially Located with the Project Area

Common Name	Scientific Name	Common Habitat Type
MAMMALS		
Coyotes	*Canis latrans*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Beavers	*Castor canadensis*	Emergent wetlands, open-water habitats
Mice and voles	Cricetidae	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Virginia opossum	*Didelphis virginiana*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Jumping mice	Dipodidae	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Porcupines	*Erethizon dorsatum*	Coniferous, deciduous, and mixed forests
Snowshoe hares	*Lepus americanus*	Coniferous forests
River otters	*Lontra canadensis*	Emergent wetlands, open-water habitats
Bobcats	*Lynx rufus*	Woody wetland habitat
Woodchucks	*Marmota monax*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Fishers	*Martes pennanti*	Deciduous and coniferous forests
Striped skunks	*Mephitis*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Weasels	*Mustela* spp.	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Least chipmunks	*Neotamias minimus*	Coniferous forests
Mink	*Neovison vison*	Woody wetland habitat
White-tailed deer	*Odocoileus virginianus*	Deciduous forests
Muskrats	*Ondatra zibethicus*	Emergent wetlands, open-water habitats
Raccoons	*Procyon lotor*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Eastern gray squirrels	*Sciurus carolinensis*	Deciduous forests
Shrews	Soricidae	Agricultural lands, scrub-shrub, grasslands, or mixed habitats

Common Name	Scientific Name	Common Habitat Type
Thirteen-lined ground squirrels	*Spermophilus tridecemlineatus*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Eastern cottontails	*Sylvilagus floridanus*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Moles	Talpidae	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Eastern chipmunks	*Tamias striatus*	Deciduous forests
Red squirrels	*Tamiasciurus hudsonicus*	Deciduous and coniferous forests
Badgers	*Taxidea taxus*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Black bears	*Ursus americanus*	Deciduous and coniferous forests
Bats	Vespertilionidae	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Red fox	*Vulpes*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
BIRDS		
Northern goshawks	*Accipiter gentilis*	Forested habitats
Sharp-shinned hawks	*Accipiter striatus*	Forested habitats
Red-winged blackbirds	*Agelaius phoeniceus*	Emergent wetlands, open-water habitats
Wood ducks	*Aix sponsa*	Woody wetland habitat
Dabbling ducks	Anatidae	Emergent wetlands, open-water habitats
Herons and egrets	Ardeidae	Emergent wetlands, open-water habitats
Great horned owls	*Bubo virginianus*	Woody wetland habitat
Red-tailed hawks	*Buteo jamaicensis*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Northern cardinals	*Cardinalis*	Forested habitats
Killdeer	*Charadrius vociferus*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Northern harriers	*Circus cyaneus*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
American kestrels	*Falco sparverius*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Swallows	Hirundinidae	Emergent wetlands, open-water habitats
Warblers	Parulidae	Forested habitats
Rose-breasted grosbeaks	*Pheucticus ludovicianus*	Woody wetland habitat
Woodpeckers	Picidae	Forested habitats
Eastern bluebirds	*Sialia sialis*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Nuthatches	*Sitta* spp.	Forested habitats
Barred owls	*Strix varia*	Woody wetland habitat
Thrushes	Turdidae	Forested habitats
Sharp-tailed grouse	*Tympanuchus phasianellus*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Vireos	Vireonidae	Forested habitats
REPTILES		
Snapping turtles	*Chelydra serpentine*	Emergent wetlands, open water habitats
Painted turtles	*Chrysemys picta*	Emergent wetlands, open water habitats
Northern brown snakes	*Storeria dekayi*	Agricultural lands, scrub-shrub, grasslands, or mixed habitats
Eastern garter snakes	*Thamnophis sirtalis*	Emergent wetlands, open water habitats
AMPHIBIANS		
Mudpuppies	*Necturus maculosus*	Emergent wetlands, open water habitats
Red-backed salamanders	*Plethodon cinereus*	Woody wetland habitat
Spring peepers	*Pseudacris crucifer*	Woody wetland habitat
Wood frogs	*Rana sylvatica*	Woody wetland habitat

Source: WDNR 1997

5.5.2.1 Sensitive Wildlife Species and Habitats

State Wildlife Areas are managed by the WDNR to sustain wildlife and natural communities, and provide public spaces for hunting, fishing, and recreation. According to WDNR online mapping, the Project avoids all WDNR Wildlife Areas in Ashland, Bayfield, and Iron counties (WDNR 2019k).

Migratory Birds and Bald Eagles

The Migratory Bird Treaty Act ("MBTA") protects migratory birds and most resident bird species within the United States. Under the MBTA, it is illegal to pursue; hunt; take; capture; kill; attempt to take, capture, or kill; possess; offer for sale; and export, import, or transport birds, their parts (e.g., feathers), and active nests (and the eggs or young within). Unlike the ESA, the MBTA does not include harassment or destruction of habitat in its list of prohibitions or within its definition of take.

Beyond the MBTA, the Bald and Golden Eagle Protection Act ("BGEPA") provides additional protection to bald and golden eagles. The BGEPA prohibits the take, possession, sale, purchase, barter, offer to sell, purchase, or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. "Take" under this act is defined as "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest or disturb." Disturb is defined as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." If a proposed project or action occurs in an area where nesting, feeding, or roosting eagles occur, the proponent often needs to implement special conservation measures to comply with the BGEPA. U.S. Fish and Wildlife Service ("USFWS") guidance on complying with the BGEPA is found in the National Bald Eagle Management Guidelines (USFWS 2007).

The Superior Coastal Plain and North Central Forest landscapes provide important habitats to migrating bird species. Migratory Bird Concentration Sites are located where large numbers of migrating birds stop for resting and feeding during migration between breeding and wintering grounds (WDNR 2019h). A multitude of rare and non-rare bird species utilize these sites.

5.5.3 Fisheries

Wisconsin ranks as the number 3 non-resident fishing destination in the county, and the fishing industry provides over 21,500 fishing-related jobs and generates nearly $2.3 billion in fishing-related economic activity (WDNR 2019c). While over 160 fish species can be found in Wisconsin, the most common recreational fish species include walleye (*Sander vitreus*), muskellunge (*Esox masquinongy*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), panfish (e.g., bluegill [*Lepomis macroshirus*] and crappies [*Pomoxis spp.*]), lake sturgeon (*Acipenser fulvescens*), and trout (WDNR 2019d).

Fisheries in the Project area generally are classified as coldwater or warm water. Coldwater streams are found statewide, and maximum summer water temperatures are typically below 71.6 °F. Coldwater streams typically contain relatively few fish species and are dominated by trout and sculpin (WDNR 2019b). Important coldwater species of fish include:

- White suckers (*Catostomus commersoni*);
- Mottled sculpin (*Cottus bairdii*);
- Brook trout (*Salvelinus fontinalis*);
- Brown trout (*Salmo trutta*); and
- Rainbow trout (*Oncorhynchus mykiss*) (WDNR 2013).

Warmwater streams are common throughout Wisconsin, and maximum water temperatures are typically greater than 77 °F. This stream type has a high diversity of fish species, and is dominated by warmwater

species in the families Cyprinidae, Catostomidae, Centrarchidae, and Percidae. Species of the greatest conservation need associated with warmwater streams include (WDNR 2019n):

- Gilt darter (*Percina evides*);
- Gravel chub (*Erimystax x-punctatus*);
- Least darter (Etheostoma microperca*);*
- Longear sunfish (*Lepomis megalotis*); and
- Slender madtom (*Noturus exilis*).

Sensitive Fish Species and Habitats

Trout streams are considered Areas of Special Natural Resource Interest, and are designated with three classifications, as follows:

- Class I includes high quality trout waters with sufficient natural reproduction to sustain populations of wild trout at or near the carrying capacity (e.g., do not require stocking of hatchery trout).

- Class II includes streams with some natural trout reproduction, but not at a level sufficient to utilize available food and space; therefore, some stocking is required to maintain a sport fishery.

- Class III includes waters with marginal trout habitat in which natural reproduction does not occur. These waters require annual stocking of trout to provide trout fishing, and there is generally no carryover of trout from one year to the next (WDNR 2019m).

The White River Fishery Area is located in portions of Bayfield and Ashland Counties. Sections of the White River are considered high-quality trout water for fishing (WDNR 2019o). The White River Fishery Area is a multiple use area for the public dedicated to trout fishing, hunting, canoeing, and outdoor recreation. Brook trout (*Salvelinus fontinalis*) and brown trout (*Salmo trutta*) are fished throughout the area, and northern pike (*Esox lucius*) and suckers (*Catostomidae spp.*) are fished in limited areas.

5.5.4 Threatened and Endangered Species

5.5.4.1 Federal Threatened and Endangered Resources

Enbridge identified federally listed and candidate species under the ESA potentially located within the Project area by using the USFWS Information for Planning and Consultation website, and by evaluating via desktop analysis, if potential habitats exists within the Project area. Six federally listed species have the potential to occur within the Project area in Ashland, Bayfield, and Iron counties (refer to Table 5.5.4-1).

Enbridge initiated coordination on the Project with the Green Bay Ecological Services Field Office (Region 3) of the USFWS in September 2019. The USACE will complete Section 7 consultation for the Project. Informal consultations with USACE, USFWS, and Enbridge will continue throughout 2020.

Table 5.5.4-1: Federally Listed Species and Designated Critical Habitat That May Occur in the Project Area

Species	Status	Habitat
MAMMALS		
Gray wolf (*Canis lupus*)	Endangered	Northern forests.
Canada lynx (*Lynx canadensis*)	Threatened	Northern forests, although no resident populations are known from Wisconsin.
Northern long-eared bat (*Myotis septentrionalis*)	Threatened	Hibernates in caves and mines—swarming in surrounding wooded areas in autumn. During summer, roosts and forages in cavities or crevices of both live and dead trees of upland forests.
BIRDS		
Rufa red knot (*Calidris canutus rufa*)	Threatened	Along Lake Superior.
Piping Plover - Great Lakes population (*Charadrius melodus*)	Endangered	Sandy beaches, bare alluvial and dredge spoil islands.
PLANTS		
Fassett's locoweed (*Oxytropis campestris var. chartacea*)	Threatened	Open sandy lakeshore.

Notes:
[a] http://ecos.fws.gov

Gray Wolf

The gray wolf is the largest of the wild dog species found in a variety of habitats throughout North America (Mech 1974). Gray wolves prey primarily on large ungulates, including white-tailed deer (*Odocoileus virginianus*), elk (*Cervus elaphus*), moose (*Alces alces*), bison (*Bison bison*), and caribou (*Rangifer tarandus)*, depending on location. They will occasionally take smaller prey, including beaver (*Castor canadensis*), insects, various small mammals, and domestic animals (USFWS 2013a). Additionally, wolves will usurp carcasses and scavenge carrion opportunistically from kills made by other carnivores (Ruth and Murphy 2010). A habitat generalist, the gray wolf originally occupied most habitat types in North America. They show no preference for one cover type over another and successfully utilize alpine, forest, grassland, shrubland, and woodland habitats across their range (Mech 1974).

Canada Lynx

The Canada lynx is a medium-size cat, which generally inhabits moist boreal forests that have cold, snowy winters and a high-density snowshoe hare prey base. The predominant vegetation of boreal forests is conifer trees, primarily species of spruce (*Picea* spp.) and fir (*Abies* spp.). In the contiguous United States, the boreal forest type transitions to deciduous temperate forest in the Northeast and Great Lakes, and to subalpine forest in the west. Individual lynx maintain large home ranges generally between 12 to 83 square miles.

Northern Long-Eared Bat

The northern long-eared bat ranges across much of the eastern United States, and as far west as eastern Wyoming and Montana. During the summer, adult females form breeding or maternity colonies that range in size from a few individuals to 30 to 60 adults (Caceres and Barclay 2000; WDNR 2019j). Males typically roost alone (Lacki and Schwierjohann 2001). Overall, the species appears to be opportunistic in selecting summer roosts (USFWS 2013b). Roost sites may include both live and dead trees and can occur under bark and in crevices or cavities, suggesting that northern long-eared bats are habitat generalists. The species' plasticity in roost selection may allow it to adapt to changes in forestry practices in its home range (Timpone

et al. 2010). Northern long-eared bats typically hibernate in caves and mines in mixed-species groups, beginning hibernation in September or October and emerging in May (WDNR 2013xy). The species does not migrate great distances between its summer roosting habitat and winter hibernacula (USFWS 2011a).

Rufa Red Knot

The red knot is a shorebird known for its long-distance migration between breeding grounds in the Arctic and wintering areas in high latitudes of the Southern Hemisphere. Three of the six red knot subspecies occur in the Western Hemisphere. One of these three subspecies—the rufa red knot—may travel as far south as Tierra del Fuego after breeding in the central Canadian Arctic (USFWS 2011b). Observations made by private individuals and reported to eBird (2019) also suggest that rufa red knots are stopping over in the Great Lakes states. When migrating through interior North America, red knots largely rely on exposed substrate at wetland edges for stopover habitat. In addition, red knots forage in cultivated fields when migrating through the interior (Gratto-Trevor et al. 2001).

Piping Plover

The Great Lakes population of piping plovers use the open, sandy beaches, barrier islands, and sand spits formed along the perimeter of the Great Lakes. They do not inhabit lakeshore areas where high bluffs formed by severe erosion have replaced beach habitat. They prefer sparsely vegetated open sand, gravel, or cobble for their nesting sites. Many of the coastal beaches traditionally used by piping plovers for nesting have been lost to commercial, residential, and recreational developments (USFWS 2019a).

Fassett's Locoweed

Fassett's locoweed is a perennial plant in the pea family that grows on gentle slopes in sand-gravel shorelines around shallow lakes that are subject to water level fluctuations. The plant depends on a large seed bank and the open habitat (above the water line) provided when lake levels are low for long-term population maintenance (USFWS 2019b).

5.5.4.2 State Threatened and Endangered Resources

In October 2019, Enbridge conducted an initial review of the WDNR NHI data set for terrestrial and wetland element occurrences within 1 mile and aquatic element occurrences within 2 miles of the Project route.

Enbridge conducted preliminary habitat assessments in 2019 and provided the report to the WDNR in January 2020; the report is included in Attachment O. Enbridge completed surveys for state-listed species based on WDNR coordination. Results of those surveys are summarized in section 6.5.4. On behalf of Enbridge, Environmental Resources Management, Inc. submitted an Environmental Review Request to WDNR on January 15, 2020; and an updated draft endangered resources review was provided to the WDNR on August 3, 2020. The review will require WDNR Endangered Species Review Program approval. A draft of the updated Endangered Resources Review Request and Response (ERR) is provided in Attachment I. Enbridge will continue to consult with the USFWS and the WDNR on the status of mitigation strategies for protected species.

There are three state endangered and two state threatened terrestrial species documented within 1 mile, and one state threatened aquatic species documented within 2 miles of the Project area. The element occurrences are shown in an updated Table 5.5.4-2 below.

Table 5.5.4-2: NHI Occurrences of Sensitive Species within the Project Area

Common name	Scientific name	State Listing status
Terrestrial and Wetland Element Occurrences within 1 Mile of the Project		
Birds		
Northern Goshawk	*Accipiter gentilis*	Special Concern
Long-eared Owl	*Asio otus*	Special Concern
American Bittern	*Botaurus lentiginosus*	Special Concern
Evening Grosbeak	*Coccothraustes vespertinus*	Special Concern
Least Bittern	*Ixobrychus exilis*	Special Concern
Peregrine Falcon	*Falco peregrinus*	Endangered
Loggerhead Shrike	*Lanius ludovicianus*	Endangered
Black-backed Woodpecker	*Picoides arcticus*	Special Concern
Western Meadowlark	*Sturnella neglecta*	Special Concern
Insects		
West Virginia White	*Pieris virginiensis*	Special Concern
Plants/lichens		
Neat Spike-Rush	*Eleocharis nitida*	Endangered
Marsh Horsetail	*Equisetum palustre*	Special Concern
Vasey's Rush	*Juncus vaseyi*	Special Concern
Fringed Rosette Lichen	*Physcia tenella*	Special Concern
Braun's Holly-fern	*Polystichum braunii*	Threatened
Yellow Specklebelly	*Pseudocyphellaria crocata*	Special Concern
Clustered Bur-Reed	*Sparganium glomeratum*	Threatened
Aquatic Element Occurrences within 2 Miles of the Project		
Insects		
A Predaceous Diving Beetle	*Agabetes acuductus*	Special Concern
A Humpless Casemaker Caddisfly	*Brachycentrus lateralis*	Special Concern
Swamp Darner	*Epiaeschna heros*	Special Concern
A Flat-headed Mayfly	*Maccaffertium pulchellum*	Special Concern
A Caddisfly	*Psilotreta indecisa*	Special Concern
Plants		
Torrey's Bulrush	*Schoenoplectus torreyi*	Special Concern
Pale Bulrush	*Scirpus pallidus*	Special Concern
Reptiles		
Wood turtle	*Glyptemys insculpta*	Threatened

Six species were identified by NHI review that are listed as threatened or endangered: peregrine falcon, loggerhead shrike, neat spike-rush, Braun's holly-fern, clustered bur-reed, and wood turtle, which are described below.

Peregrine Falcon

The state endangered peregrine falcon is a crow-sized raptor found throughout North America (WDNR 2020b). In Wisconsin, the species is typically seen during migration to Canada and southern wintering grounds; however, captive-bred and released falcons have established breeding territories in or near Milwaukee, Sheboygan, Madison, and La Crosse, Wisconsin (WDNR 2020b). Peregrine falcons primarily feed on other birds, which they hunt by diving at great speed to strike and kill their prey mid-air (USFWS 2006). The species nests on high cliffs or bluffs, but are known to utilize anthropogenic habitats for nesting, such as the ledges of skyscrapers or smoke stacks in large cities (WDNR 2020b).

Loggerhead Shrike

The state endangered loggerhead shrike prefers open, grassy country with scattered shrubs or small trees, specifically favoring edge habitat, nesting along roadsides and hedgerows in agricultural regions. The shrike arrives in Wisconsin in late March or early April and leaves in September or October. The WDNR avoidance period is April 20 to August 1 (WDNR 2019g).

Neat Spike-Rush

The state endangered neat spike-rush is found in the Superior Coastal Plain in northern Wisconsin on wet, exposed clay soils in ditches, openings in alder thickets, and marshes (WDNR 2020c). The species is occasionally (e.g., moderate association) found in transportation and utility corridors (WDNR 2020c).

Braun's Holly-Fern

The Braun's holly-fern is a state threatened plant species typically found in rich hardwood or mixed conifer-hardwood forests near ravine bottoms. It can also be found in areas of cold air drainage, on gentle to moderately steep, rocky, forested slopes, and at the bases of moist cliffs. Conservation recommendations include avoidance measures such as conducting work in frozen, snow-covered ground conditions when the plant species cannot be avoided; spot spraying in lieu of broadcast spraying of herbicides in potential fern habitat; and avoidance of direct disturbance of preferred fern habitat (e.g., seeps, cliffs, and moss-covered boulders) (WDNR 2019a).

Clustered Bur-Reed

The state threatened clustered bur-reed is found on the Lake Superior clay plain in cold ditches and pools within sedge meadows, willow-alder thickets, and tamarack stands (WDNR 2020d). The species is occasionally (e.g., moderate association) found in transportation and utility corridors (WDNR 2020d).

Wood Turtle

The state threatened wood turtle uses moderate- to fast-flowing, clear streams or rivers associated with forested riparian corridors for primary overwintering, courtship, basking, and foraging habitat (WDNR 2013). Typically, these waterways possess a sand, gravel, or cobble substrate with limited silt or muck. Nesting occurs in well-drained, open or sparsely vegetated sandy soils, typically within 200 feet of suitable aquatic habitat. Nesting habitats include native dry prairies, moderately sloughing sand banks, sandbars, agricultural fields, or areas of disturbed sandy soils that support no or sparse ground layer vegetation (WDNR 2013). Nesting and overwintering are the two most sensitive periods for the turtle. Conservation recommendations typically include fencing, timing of activities, and educating/training of construction crews.

Species of Greatest Conservation Need and Priority Habitats

Wisconsin's Wildlife Action Plan ("WWAP") defines Species of Greatest Conservation Need ("SGCN") as native wildlife species that have low or declining populations and that are most at risk of no longer being a viable part of Wisconsin's fauna (WDNR 2005). The WWAP also identifies habitats with which SGCN are associated, locations where SGCN occur across the state, and conservation actions that can help keep SGCN from being listed as threatened or endangered in the future. According to the WWAP's Implementation Plan (WDNR 2008), the Project will cross through the Lake Superior Grasslands Conservation Opportunity Area from MP 0 until approximately MP 3.8, just north of the White River. Extensive grassland communities, such as the Lake Superior Grasslands, are considered important state

resources in Wisconsin. These communities may include prairies, sand barrens, fens, pastures, hayfields, and other non-native grasslands (WDNR 2019l). Table 5.5.4-3 lists the SGCN associated with this Conservation Opportunity Area.

Table 5.5.4-3: Species of Greatest Conservation Need Associated with the Lake Superior Grasslands COA

Common Name	Scientific Name	Ecological Landscape Association Score[a]
MAMMALS		
Northern Flying Squirrel	*Glaucomys sabrinus*	3
Woodland Jumping Mouse	*Napaeozapus insignis*	3
Franklin's Ground Squirrel	*Poliocitellus franklinii*	2
Water Shrew	*Sorex palustris*	3
BIRDS		
Le Conte's Sparrow	*Ammodramus leconteii*	3
Long-eared Owl	*Asio otus*	2
Upland Sandpiper	*Bartramia longicauda*	1
American Bittern	*Botaurus lentiginosus*	3
Short-eared Owl	*Asio flammeus*	2
Bobolink	*Dolichonyx oryzivorus*	2
American Woodcock	*Scolopax minor*	3
Eastern Meadowlark	*Sturnella magna*	1
Western Meadowlark	*Sturnella neglecta*	1
Sharp-tailed Grouse	*Tympanuchus phasianellus*	2
Golden-winged Warbler	*Vermivora chrysoptera*	3
REPTILES		
Wood Turtle	*Glyptemys insculpta*	3
INVERTEBRATES		
A Hydroporus Diving Beetle	*Heterosternuta pulcher*	3
A Flat-headed Mayfly	*Maccaffertium pulchellum*	2
Plains Emerald (Lemon-faced Emerald)	*Somatochlora ensigera*	1

Notes:
[a] The Ecological Landscape Association Score indicates where the SGCN's association with the Superior Coastal Plain is high (score = 3) moderate (score = 2), or low (Score = 1) (WDNR 2005).
COA = Conservation Opportunity Area; SGCN = Species of Greatest Conservation Need

Source: WDNR Conservation Opportunity Areas and Wisconsin's Ecological Landscapes Website

5.6 LAND USE AND PUBLIC LANDS

Enbridge used the Wiscland 2.0 Land Cover Data (WDNR 2019s) in combination with other publicly available land use information to identify land cover and uses within the Project area (refer to Attachment G). The Wiscland data uses a hierarchical classification scheme comprised of four levels of increasingly detailed descriptions. For example, areas mapped as Level 1 forest are further classified as coniferous, broad-leaved deciduous and mixed deciduous/coniferous forest in Level 2. Enbridge reviewed both Level 1 and Level 2 data in this analysis. Seven Level 1 cover classes and eleven Level 2 cover classes

characterize the Project area. Definitions of the land cover classifications mapped within the Project area are provided in the Wiscland 2 Land Cover User Guide (WDNR 2019s) and are as follows:

- Urban/Developed (Level 1) consists of structures and areas associated with intensive human activity and land use.
    - Developed, High Intensity (Level 2) consists of areas with 50 percent or greater solid impervious cover of man-made materials.
    - Developed, Low Intensity (Level 2) consists of areas with 25 percent or greater solid impervious cover of man-made materials, but less than 50 percent. These areas may have some interspersed vegetation.
- Agriculture (Level 1) consist of land under cultivation for food or fiber.
    - Crop Rotation (Level 2) consists of areas dedicated to agriculture row crop production, where the planting of different annual crops is alternated each year or for perennial crops every two to five years.
- Grassland (Level 1) consists of lands covered by non-cultivated herbaceous vegetation predominated by perennial grasses. Forbs and other grass-like plants may be present or sometimes even dominant.
    - Forage Grassland (Level 2) consists of lands covered by perennial herbaceous vegetation used for livestock forage production and grazing.
    - Idle Grassland (Level 2) consists of lands covered primarily by perennial herbaceous vegetation not used for livestock forage and grazing.
- Forest (Level 1) consists of upland areas of land covered with woody perennial plants, the trees reaching a mature height of at least 6 feet tall with definite crown (closure of at least 10 percent).
    - Coniferous Forest (Level 2) consists of upland areas whose canopies have a distinct crown closure of which no less than two-thirds (67 percent) should be of the coniferous tree group.
    - Broad-leaved Deciduous Forest (Level 2) consists of upland areas whose canopies have a distinct crown closure of which no less than two-thirds (67 percent) should be of the broad-leaved deciduous tree group.
    - Mixed Deciduous/Coniferous Forest (Level 2) consists of upland areas whose canopies must have a distinct crown closure, of which no more than two-thirds (67 percent) should be from either of the species group (coniferous or deciduous).
- Wetland (Level 1) consists of an area that has soils indicative of wet conditions and where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation.
    - Emergent/Wet Meadow (Level 2) consists of persistent and non-persistent herbaceous plants standing above the surface of the water or wet soil and covering 30 percent or more of the area (e.g., cattails, Canada bluejoint grass, sedges, rushes, or forbs, such as asters, goldenrods, and nettles).

  - Lowland Scrub/Shrub (Level 2) consists of areas with 30 percent or more woody vegetation, less than 20 feet tall, with a tree cover of less than 10 percent, occurring in wetland areas.
  - Forested Wetland (Level 2) consists of wetlands dominated by woody perennial plants, with a canopy cover greater than 10 percent, trees reaching a mature height of at least 20 feet, and covering 30 percent or more of the area.
- Open Water (Level 1) consists of areas of water with no vegetation present.
- Barren (Level 1) consists of land of limited ability to support life and in which less than one-third (33 percent) of the area has vegetation or other cover. If vegetation is present, it is more widely spaced and scrubby than that in Shrubland.

The Project crosses Farmland Preservation Areas ("FPAs"), parcels with Farmland Preservation easements, and Agricultural Enterprise Areas ("AEAs"). Wisconsin's Farmland Preservation Program helps farmers and local governments preserve farmland, protect soil and water, and minimize land use conflicts, including the development of Farmland Preservation Plans that serve as non-binding guidance documents to provide a local vision for agricultural preservation, agricultural development, and the development of agricultural enterprises. AEAs are community led efforts establishing designated areas important to Wisconsin's agricultural future. More specifically, an AEA is an area of productive agriculture that has received designation from the state at the request of landowners and local governments. As a part of the state's Farmland Preservation Program, AEAs strive to support local farmland protection goals.

The Project will also cross a number of parcels with conservation program agreements under the DATCP Soil and Water Resource Management Grant Program and Wisconsin's Managed Forest Law. DATCP Soil and Water Resource Management grants help pay for county conservation staff and finance cost-sharing with producers who install conservation practices with county assistance. The Managed Forest Law ("MFL") program is a landowner incentive program that encourages sustainable forestry on private woodland. In exchange for following sound forest management, the landowner pays reduced property taxes. The MFL was enacted in 1985 and replaced the Woodland Tax Law and the Forest Crop Law.

In addition, the Project will have four railroad crossings, a number of local, county, and state road crossings, and one crossing of a US highway. The project also crosses Iron County Forest, as well as a number of all-terrain vehicle ("ATV"), county and snowmobile trails. In addition, there will be two crossings of the North Country National Scenic Trail ("NST"). Figure 5.6-1 shows the location of trails crossed by the Project. The National Park Service administers the North Country NST in cooperation with other federal, state, and local agencies, private organizations, and landowners. The North Country NST is 1 of 8 National Scenic Trails in the United States and 1 of 42 designated Wisconsin state trails. Within Wisconsin, the Wisconsin Department of Natural Resources, the National Park Service, and the North Country Trail Association cooperatively develop and maintain the North Country NST, which crosses 200 miles of the northwest corner of the state in Douglas, Bayfield, Ashland, and Iron Counties (WDNR 2019i). Currently an access road occurs on a WDNR parcel near the White River; however, Enbridge is reconfiguring this road to remove it from WDNR lands.

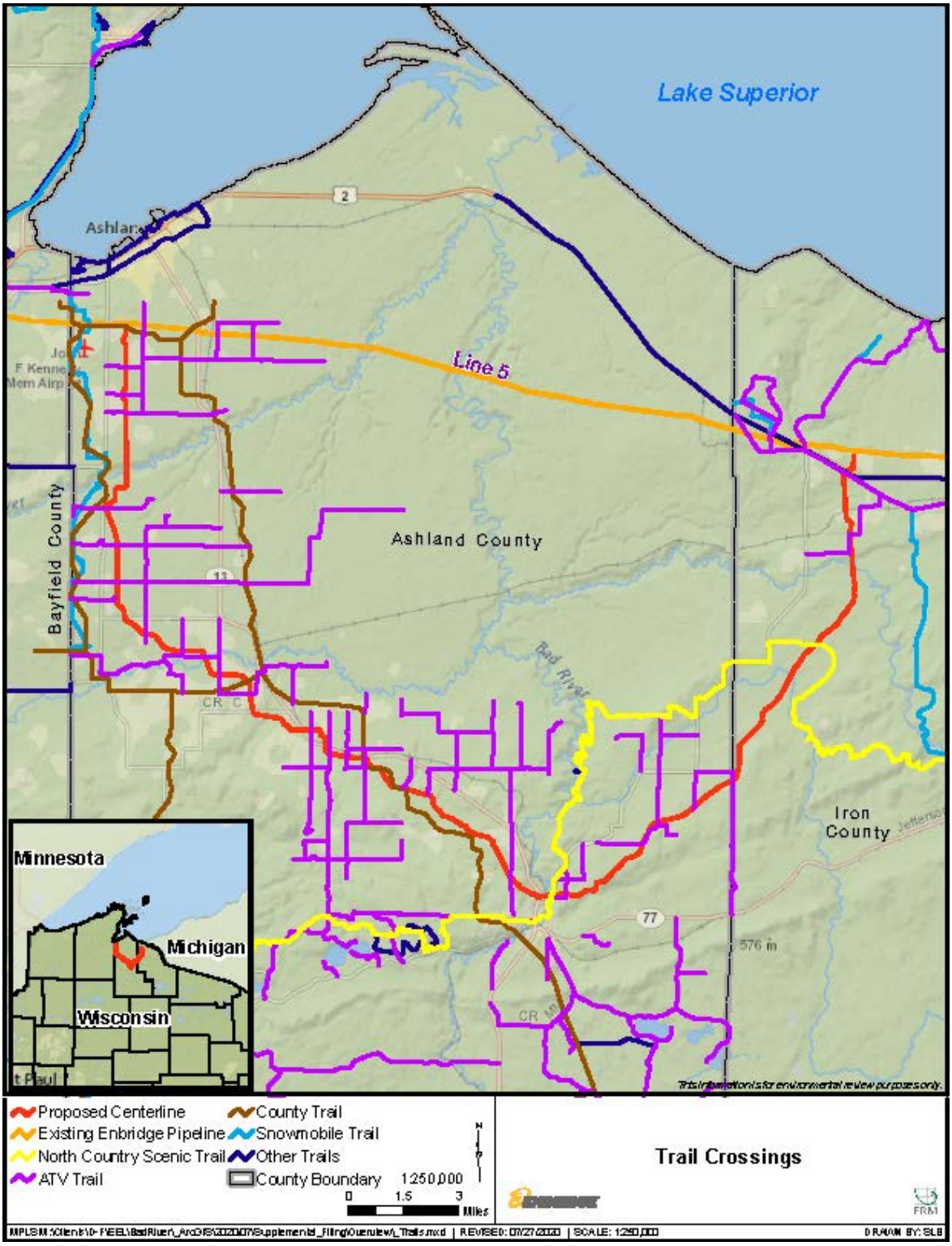

Figure 5.6-1: Trails Crossed by the Proposed Project

5.7 SOCIOECONOMIC RESOURCES

5.7.1 Existing Socioeconomic Conditions

Enbridge reviewed 2013 and 2017 U.S. Census Bureau data and estimates to gather information on existing socioeconomic conditions in Ashland and Iron Counties, Wisconsin. Table 5.7.1-1 presents information on current population levels and density, per-capita income, workforce, unemployment rates, and employment industries.

Table 5.7.1-1: Existing Socioeconomic Conditions in the Project Area

State/ County	Population Estimate [a]	Population Density (people per square mile)[a]	Per Capita Income [a]	Civilian Labor Force	Unemployment Rate (percent)	Major Employment Industries
Wisconsin	5,813,568	105.0	$31,177	3,085,151 [b]	4.7 [b]	Educational, health, and social services; manufacturing; retail trade; arts, entertainment, recreation, and accommodation and food services [b]
Ashland County	15,600	15.5	$22,983	62.6% [b]	7.2 [b]	Educational, health, and social services; retail trade; arts, entertainment, recreation, and accommodation and food services; manufacturing [b]
Bayfield County	15,042	10.2	$29,886	58.1% [c]	5.5 [e]	Accommodation and food services; retail trade; healthcare and social assistance; manufacturing
Douglas County	44,159	33.9	$28,888	64.2% [C]	4.2 [c]	Educational, health, and social services; manufacturing; retail trade; arts, entertainment, recreation, and accommodation and food services [b]
Iron County	5,676	7.8	$26,689	54.8%	7.8 [b]	Educational, health, and social services; manufacturing; arts, entertainment, recreation, and accommodation and food services; retail trade [b]

Notes:

[a] U.S. Department of Commerce, Bureau of the Census: State and County Quick Facts, https://www.census.gov/quickfacts/fact/table/US/PST045218. 2018 (estimated population); 2010 (population density); 2013-2017 (per capita income 2017 USD)

[b] U.S. Department of Commerce, Bureau of the Census: American FactFinder, http://factfinder.census.gov. 2013-2017 (civilian labor force, unemployment rate, and major employment industries)

[c] U.S. Department of Commerce, Bureau of the Census: American FactFinder, http://factfinder.census.gov. 2014-2018 (civilian labor force and unemployment rate)

[d] U.S. Department of Commerce, Bureau of the Census: American FactFinder, http://factfinder.census.gov. 2012 (major employment industries)

[e] U.S. Department of Commerce, Bureau of the Census: American FactFinder, http://factfinder.census.gov. 2017 (major employment industries)

Population density (an indicator of the extent of economic development) in Ashland, Bayfield, and Iron Counties averages 15.5, 10.2, and 7.8 people per square mile, respectively. The county-level population density is lower than the Wisconsin average of 105.0 people per square mile, reflecting the rural character of the Project area.

In 2018, the population of Ashland County was approximately 15,600, which marks an approximately 3.4 percent decrease from the 2010 population. Similarly, as of 2018, the population of Iron County was 5,676, which indicates an approximately 4.1 percent decrease. However, Bayfield County increased 0.2 percent from 2010 to 2018.

Per capita income in 2017 was $22,983 in Ashland County, and $29,886 in Bayfield County, and $26,689 in Iron County, slightly below the state average of $31,177. Generally, per capita income is lower in rural counties with low population densities and high unemployment rates, and higher in urban counties with high population densities and low unemployment rates. The unemployment rates in the Project area are higher than the statewide average. Ashland County's unemployment rate is 7.2 percent, Bayfield County's rate is 5.5 percent, and Iron County's rate is 7.8, compared to a statewide average of 4.7 percent.

Employment in the Project area is concentrated in the educational, health, and social services; retail trade; and arts, entertainment, recreation, and accommodation and food services industries.

In general, the pipeline route avoids population centers and residential areas. Much of the route is in forest, grassland, and agricultural areas.

5.8 CULTURAL RESOURCES

Archaeological and historic resources, also referred to as "cultural resources" are the material remains of human activity, and can include sites, buildings, objects, and landscapes. Cultural resources are finite and non-renewable; once destroyed they and the information they provide are lost. Federal laws and regulations, beginning with the NHPA of 1966, provide the standards for cultural resources identification, evaluation, and mitigation of impacts. If a cultural resource meets the criteria for listing on the NRHP, it is considered significant and termed a "historic property."

Enbridge has completed Phase I inventory surveys of the Project area to identify archaeological sites and historic standing structures, to evaluate these sites regarding NRHP eligibility, and to assess Project impacts to them. Avoidance of inventoried archaeological sites and historic structures is Enbridge's preferred method of treatment. In the event that engineering controls are unable to avoid impacts on a site, Enbridge will conduct site evaluations and seek resolution through mitigation for those sites that meet the criteria for listing on the NRHP.

Enbridge has also conducted Traditional Cultural Resources ("TCR") survey and interviews with citizens of tribal nations to identify Traditional Cultural Properties that may be considered eligible under NRHP and other areas that may have historical and cultural significance.

The 2020 Phase I Archaeological Survey Addendum Report and the Traditional Cultural Resources Report are provided as Attachment J-1 and Attachment M in the Supplemental Application Information.

6 ENVIRONMENTAL EFFECTS

Section 6 addresses likely impacts on each resource associated with construction and operation of the Project.

6.1 AIR QUALITY AND NOISE

6.1.1 Air Quality

This section addresses the construction and operating emissions from the Project, as well as projected impacts and compliance with regulatory requirements.

6.1.1.1 Applicable Air Quality Rules

The CAA, as amended in 1977 and 1990, is the underlying federal statute governing air pollution. The provisions of the CAA that are potentially applicable to construction and operation of crude oil and NGL pipeline projects are:

- Prevention of Significant Deterioration/Nonattainment New Source Review;
- Federal Class I Area Protection;
- New Source Performance Standards;
- National Emission Standards for Hazardous Air Pollutants;
- Title V Operating Permits;
- State Regulations; and
- Conformity of General Federal Actions.

The State of Wisconsin administers the CAA within the State under regulations adopted at Chapters NR 400-499 and approved by USEPA in the State Implementation Plan set forth at subpart YY to Chapter 52 of Title 40 of the Code of Federal Regulations. Based on the nature of the Project, including the lack of major air emission sources and new or modified aboveground stationary sources, none of the CAA provisions listed above and administered by the State of Wisconsin apply to the Project.

Greenhouse Gases

Both naturally occurring and anthropogenic sources release GHGs into the atmosphere. Anthropogenic sources, sources originating from human activities, of GHGs include the transport and combustion of fossil fuels. To evaluate the impacts on climate change from the emissions of greenhouse gases, Enbridge considered the direct and reasonably foreseeable indirect GHG emissions from the Project.

Direct GHG emissions stemming from construction will be generated by mobile sources during the construction period, and will cease upon completion of construction. The Project does not require the installation of any additional pumping stations, and for this reason, operational impacts will not be significant and are not expected to have an impact on air quality. Indirect GHG emissions are those emissions that are reasonably foreseeable but may be further in the future or separated by geographies, yet still related to the project. The scope of the Project includes the replacement of existing pipeline segments that do not increase pipeline capacity or utilization for Line 5. The Project does not provide natural gas liquids or crude oil to new markets or to new users for which additional downstream GHG contributions should be estimated. The downstream uses of the natural gas liquids or crude oil are not anticipated to change as a result of the Project. The direct and reasonably foreseeable environmental impacts regarding

GHGs for the Project will not be significant based upon the minimal direct contributions and the lack of new indirect contributions.

6.1.1.2 General Construction and Operation Impacts and Mitigation

The following federal air quality regulation will also apply to the Project:

- Gasoline and diesel engines used for construction, including mobile generators, are subject to federal mobile source emission regulations found in 40 CFR Chapters 85, 1039, and 1068.

Construction and operation of the Project will not have a significant impact on air quality. Construction of the pipeline and associated facilities could result in intermittent and short-term mobile source and fugitive emissions. These emissions would include dust from soil disruption and combustion emissions from the construction equipment.

Operation of the new replacement pipeline will result in fugitive volatile organic compound emissions from the following equipment:

- Piping modifications
- Pressure relief systems
- Pressure control valves

Construction Emissions

Air quality impacts associated with construction of the Project will include emissions from construction equipment, vehicle traffic, and fugitive dust. Such air quality impacts will be temporary, short-term, and localized. A qualitative discussion of construction emissions is provided below.

Emissions from construction equipment will be minimal. Construction equipment, vehicles, and other mobile sources may be powered by ultralow sulfur diesel or gasoline engines that are sources of combustion-related emissions, including nitrous oxide, carbon monoxide, volatile organic compounds, sulfur dioxide, PM_{10}, $PM_{2.5}$, and minimal amounts of Hazardous Air Pollutants. Emissions from equipment in any given area will be short-term and localized as most equipment and activities will move along the route, and the use of more stationary equipment (e.g., drilling equipment) will be for a relatively short duration. Construction equipment will be operated on an as-needed basis. Emissions from construction equipment will be minimized by maintaining the equipment in accordance with the manufacturer's recommendations.

Fugitive dust emissions may result from vehicular traffic and from soil disruption from excavation and backfilling activities. Fugitive dust emissions are expected to be minimal based on the short duration of the Project. The amount of fugitive dust generated will depend on a variety of factors, including duration and type of construction activity, moisture content and type of soils that will be disturbed, wind speed and frequency of precipitation, area of disturbance, and the number and types of vehicles traveling over the construction areas. Nuisance fugitive dust emissions will be controlled as needed by application of water on the surface of disturbed soils and limiting the speed of equipment on access roads and the right-of-way.

Enbridge's EPP specifies that the Contractor take reasonable steps to control construction-related dust near residential areas and other areas as directed by Enbridge (refer to Attachment D filed on February 11, 2020). Control practices may include wetting the ROW and access roads, limiting working hours in residential

areas, reestablishment of vegetation and/or additional measures as appropriate based on site-specific conditions. The use of dust suppression BMPs in accordance with Enbridge's EPP would minimize fugitive dust emissions during construction of the Project, thereby minimizing potential air quality impacts on nearby residential and commercial areas.

Conditions after completion of construction would transition to operational-phase emissions after commissioning and initial startup of the Line 5 replacement.

Operational Emissions

Enbridge does not expect the level of emissions from the Project to cause or contribute to a violation of any federal, state, or local air quality standards. The Project will have *de minimis* emissions during operation of the proposed pipeline replacement.

6.1.2 Noise

Noise impacts from the proposed Project are considered short term and related to construction activities. Long-term noise impacts associated with operations are not anticipated.

Construction of the Project would temporarily increase noise levels in the areas near the proposed Project right-of-way, and the noise levels would vary depending on the construction phase. Table 6.1.2-1 shows estimated maximum noise levels of construction equipment commonly used during pipeline construction.

Table 6.1.2-1: Estimated Maximum Noise Levels for Construction Equipment (dBA)

Construction Equipment	Noise Levels (dBA)
Pickup truck	55
Welding torch	73
Dewatering pump	77
Backhoe	80
Ground compactor	80
Air Compressor	80
Concrete pump truck	82
Generator	82
Hydraulic excavator	85
Dozer	85
Grader	85
Scraper	85
Crane	85
Jackhammer	85
Rock drill	85
Pile driver	95

Notes: dBA = sound level from A-weighted decibels
Source: U.S. Department of Transportation, Federal Highway Administration 2006

The Project would predominantly be constructed through Forest, grasslands, agricultural areas, and wetlands, as well as some urban/developed areas. At any location, the magnitude and frequency of existing environmental noise may vary considerably throughout the day and week due to natural and human sources and factors. Existing ambient sound levels have not been measured in the Project area. There are 129 residences within 300 feet of the proposed pipeline route, and 10 of these are within 25 feet of the route.

Residents of these homes may be considered sensitive receptors as they would likely be more susceptible to the effects of noise than the population at large because of their proximity to localized sources of noise. Based on aerial photography review, there are no schools, churches, or hospitals within 150 feet of the Project workspace.

The heavy equipment needed to construct the Project would have a short-term impact on noise levels in the vicinity of the construction workspace. The equipment noise would be localized and limited to the period of construction. The Project area is comprised of mostly forested, grassland and agricultural use types with occasional residences located throughout. Because the Project crosses primarily rural and undeveloped areas, the general public would experience only limited nuisance noises. In the vicinity of residential areas, reasonable measures would be taken to control construction-related noise. These would include using equipment fitted with standard muffler systems, working to complete construction near homes quickly, and minimizing idling times near residences for equipment that is not in active use. In addition, Enbridge would limit the hours of construction activities with high-decibel noise levels in residential and developed areas for most activities. Nighttime noise levels would not be impacted because construction activities would not occur at night (9 pm until 6 am) except for HDDs, time restricted waterbody crossings, and road crossings. HDD sites will operate 24 hours per day, 7 days per week ("24/7") until completed. At those sites, Enbridge will seek any permitting necessary, field any noise complaints, and provide reasonable accommodations such as relocation or sound barriers. Work may be done 24/7 at any crossing with a time restricted duration such as stream crossings. Road crossing work may be done 24/7 to allow the shortest duration of impact to the road and users. Should these circumstances arise, Enbridge would seek any noise related permits from local jurisdictions. Enbridge would also maintain close contact with affected landowners along the route before, during, and after construction.

No noise is expected to be generated by the pipeline during normal operations. Maintenance activities on the new right-of-way, such as excavation or mowing, may generate some noise but these activities and the associated noise will be temporary, localized, and intermittent. A small amount of operational noise would be generated at the valve sites; however, the sound level associated with the operation of the valve sites would be low and would not likely be perceptible outside of the new right-of-way during normal operations.

6.2 SOILS

6.2.1 Soil Characteristics and Assessments

Enbridge analyzed the Project workspace using SSURGO data to identify soil map units in the Project area and identify soil characteristics that could affect or be affected by pipeline construction. These characteristics include highly erodible soils, prime farmland, farmland of statewide importance, hydric soils, compaction-prone soils, presence of stones, shallow bedrock, droughty soils, depth of topsoil, and percent slope.

Tables 6.2.1-1 and 6.2.1-2 summarize the acreage of key soil characteristics that could be impacted by construction and operation of the Project. The following sections discuss the individual soil characteristics separately.

Table 6.2.1-1: Acres of Soil Characteristics Affected by the Project [a, b]

Facility	Total Acres	Prime Farmland [c]	Farmland of Statewide Importance [d]	Hydric Soils [e]	Compaction Prone [f]	Highly Erodible		Droughty [i]	Rocky [j]	Shallow Bedrock [k]
						Water [g]	Wind [h]			
Pipeline										
Permanent ROW	239.0	4.3	67.4	13.3	26.9	70.9	43.5	22.5	98.7	5.5
Temporary Workspace	497.2	6.1	154.7	17.2	55.8	142.9	116.6	65.4	183.0	11.8
Access Roads										
Permanent Roads	3.4	0.0	1.6	0.0	0.3	0.4	2.0	0.5	0.0	0.0
Temporary Roads	117.2	1.1	12.0	8.2	5.5	34.3	15.4	13.2	75.8	2.6
Appurtenant Facilities										
Pipe Yards	57.9	0.0	13.8	0.3	6.2	5.8	7.2	7.0	14.0	4.1
Valves	0.9	0.0	0.6	0.0	0.2	0.0	0.3	0.1	0.0	0.0
Project Total	**915.6**	**11.5**	**250.2**	**39.0**	**94.9**	**254.3**	**185.0**	**108.7**	**371.6**	**24.0**

Notes:

[a] The area affected includes permanent workspace, temporary workspace, and access roads.

[b] The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends. The values in each row do not add up to the total acreage for each facility because the soils may occur in more than one characteristic class or may not occur in any class listed in the table.

[c] As designated by the Natural Resources Conservation Service. Prime farmland includes those soils that are considered prime if a limiting factor is mitigated (e.g., through artificial drainage).

[d] Farmland of Statewide Importance is land other than prime farmland that is of statewide importance for the production of food, feed, fiber, forage, or oilseed crops.

[e] As designated by the Natural Resources Conservation Service.

[f] Soils in somewhat poor to very poor drainage classes with surface textures of sandy clay loam and finer.

[g] Soils in land capability subclasses 4E through 8E and soils with an average slope greater than 8 percent.

[h] Soils with a wind erodibility group classification of 1 or 2.

[i] Soils with a surface texture of sandy loam or coarser that are moderately well to excessively drained.

[j] Soils with one or more horizons that have a cobbley, stony, bouldery, channery, flaggy, very gravelly, or extremely gravelly modifier to the textural class and/or contain greater than 5 percent by weight rocks larger than 3 inches.

[k] Soils identified as containing bedrock within 60 inches of the soil surface. All shallow bedrock in Project area is lithic (hard) bedrock.

ROW = right-of-way

Table 6.2.1-2: Topsoil Depths in the Project Area [a, b]

		Acres of Topsoil Depth (inches)				
Facility	**Total Acres**	**0-6 [c]**	**>6-12**	**>12-18**	**>18**	**Organic soils [d]**
Pipeline						
Permanent ROW	239.0	226.7	3.4	0.0	2.0	7.0
Temporary Workspace	497.2	480.9	3.7	0.0	2.9	9.7
Access Roads						
Permanent Roads	3.4	3.4	0.0	0.0	0.0	0.0
Temporary Roads	117.2	105.4	0.0	0.0	5.6	6.1
Appurtenant Facilities						
Pipe yard	57.9	57.7	0.0	0.0	0.0	0.3
Valves	0.9	0.9	0.0	0.0	0.0	0.0
Project Total	**915.6**	**874.9**	**7.2**	**0.0**	**10.5**	**23.0**

Notes:

[a] The area affected includes permanent workspace, temporary workspace, and access roads.

[b] The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends. The values in each row do not add up to the total acreage for each facility because the soils may occur in more than one characteristic class or may not occur in any class listed in the table.

[c] Includes water, rock outcrops, pits, and anthropologically disturbed soils.

[d] Organic soils are those in which the organic carbon content exceeds 12 to 20 percent by weight, dependent on clay content and saturation frequency.

ROW = right-of-way

6.2.2 General Construction and Operation Impacts and Mitigation

Pipeline construction activities, such as clearing, grading, trench excavation, and backfilling, as well as the movement of construction equipment along the right-of-way, may result in impacts to soil resources. Clearing removes protective cover and exposes soil to the effects of wind and precipitation, which may increase the potential for soil erosion and movement of sediments into sensitive environmental areas. Grading and equipment traffic may compact soil, reducing porosity and infiltration rates, which could result in increased runoff potential. Trench excavation and backfilling could lead to a mixing of topsoil and subsoil and may introduce rocks to the soil surface from deeper soil horizons. Contamination from release of fuels, lubricants, and coolants from construction equipment could also affect soils. Enbridge will minimize or avoid these impacts on soils by implementing the measures described in the EPP (refer to Attachment D filed on February 11, 2020).

6.2.2.1 Prime Farmland and Topsoil Segregation

Prime Farmland

The U.S. Department of Agriculture defines prime farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. It has the soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, few or no rocks, and is permeable to water and air. Prime farmland does not excessively erode or saturate with water for long periods. In addition, either it does not flood frequently during the growing season or it is protected from flooding. Soils that do not meet the above criteria may be considered prime farmland if the limiting factor is mitigated (e.g., by controlling soil

moisture conditions through artificial drainage). The Project will affect approximately 11.5 acres of prime farmland soils.

Farmland of statewide importance is land other than prime or unique farmland that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops. The appropriate state or local government determines statewide important farmland with concurrence from the State Conservationist. Generally, these farmlands produce high yields of crops when treated and managed according to acceptable farming methods. In some states or localities, farmlands of statewide importance may include tracts of land designated for agriculture by state law or local ordinance. Impacts on farmland of statewide importance could include interference with agricultural drainage (if present), mixing of topsoil and subsoil, and compaction and rutting of soil. These impacts could result from right-of-way clearing, trench excavation and backfilling, and vehicular traffic within the construction right-of-way. The Project will temporarily impact approximately 250.2 acres of farmland of statewide importance, of which approximately 2.2 acres will be permanently removed from production for construction of mainline block valves and associated permanent access roads.

Enbridge will implement the measures described in its EPP to minimize impacts on farmland of statewide importance and promote the long-term productivity of the soil. These measures will include topsoil segregation, compaction alleviation, removal of excess rock, and restoration of agricultural drainage systems and existing erosion control structures.

Topsoil Segregation

Topsoil thickness is the result of factors, such as wetness, topography, climate, and the predominant vegetation present when the soil formed. Other factors being equal, prairie soils have more topsoil than forest soils, and wet soils have more topsoil than dry soils. According to data presented in Table 6.2.1-2, the majority of the soils impacted by the project have a topsoil depth of 0–6 inches.

To minimize topsoil disturbance and topsoil/subsoil mixing associated with pipeline construction, Enbridge will remove and segregate topsoil in cropland, hay fields, pasture, residential areas, and other areas as requested by the landowner (refer to the EPP typical drawings presented as Figures 1, 2, and 3 in Appendix A of the EPP). Enbridge will strip topsoil to a maximum depth of 12 inches unless a landowner requests otherwise. If less-than-specified maximum depths of topsoil are present, the Contractor will attempt to segregate the topsoil to the depth that is present. Enbridge will stockpile the segregated topsoil and subsoil separately, and replace in the proper order during backfilling and final grading of the construction right-of-way.

6.2.2.2 Soil Compaction and Rutting

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. Approximately 94.9 acres of compaction prone soil will be crossed by the Project.

Enbridge will minimize compaction and rutting impacts by implementing the measures described in its EPP (refer to Attachment D filed on February 11, 2020). These measures may include temporarily suspending certain construction activities on susceptible soils during wet conditions, constructing from timber mats, or

using low-ground-weight equipment in wetlands. Enbridge will use deep tillage operations during restoration activities on agricultural land to alleviate compaction impacts, as necessary.

6.2.2.3 Erosion by Wind and Water

Erosion is a continuing natural process that can be accelerated by human activity. Factors that influence the degree of erosion include soil texture, soil structure, length and percent of slope, vegetative cover, and rainfall or wind intensity. Bare or sparse vegetative cover, non-cohesive soil particles with low infiltration rates, and moderate to steep slopes typify soils most susceptible to water erosion. Bare or sparse cover soils, sandy or loamy surface texture, low organic matter, and small soil aggregates typify soils most susceptible to wind erosion.

Clearing, grading, and equipment movement could accelerate the erosion process and, without adequate protection, result in discharge of sediment to adjacent waterbodies and wetlands. The Project will affect 254.3 acres of highly water erodible soils and 185.0 acres of highly wind erodible soils.

Enbridge will implement the erosion control measures described in the EPP (refer to Attachment D filed on February 11, 2020) to minimize erosion both during and after construction activities. These measures may include construction of silt fences, installation of slope breakers, temporary sediment barriers, and permanent trench breakers, as well as revegetation and mulching of the construction right-of-way. Enbridge will inspect and maintain erosion and sedimentation controls as necessary until final stabilization. Enbridge also will implement dust mitigation measures, including the use of water trucks, as needed, to reduce impacts from wind erosion.

6.2.2.4 Droughty Soils

Moderately well to excessively drained soils with a coarse surface texture (i.e., sandy loam or coarser) may be difficult to revegetate. Drier soils contain less water to aid in the germination and eventual establishment of new vegetation. Coarser textured soils also have a lower water holding capacity, which could result in moisture deficiencies in the root zone, creating unfavorable conditions for many plants.

Clearing, grading, and equipment movement could amplify the effects of droughty soils and, without adequate protection, could result in reduced revegetation success. The Project will affect approximately 108.7 acres of droughty soil.

Enbridge will minimize the impacts of pipeline construction on droughty, non-cultivated soils by timely reseeding using species tolerant of dry conditions and by applying mulch to conserve soil moisture. Standard seed mix lists developed based on NRCS recommendations are provided in Appendix C of the EPP (refer to Attachment D filed on February 11, 2020).

6.2.2.5 Rocky Soils and Shallow Bedrock Soils

Trenching or grading can bring stones or rocks to the soil surface where they can damage farm equipment and interfere with planting. Similarly, backfilling shallow bedrock could redistribute rock to an overlying soil horizon, which may reduce soil moisture-holding capacity. The Project will affect approximately 371.6 acres of rocky soils.

Approximately 5.5 acres of the proposed permanent ROW has lithic bedrock (i.e., hard, unweathered bedrock) within 60 inches of the soil surface. If bedrock is encountered during trenching, Enbridge will only backfill with this rock to the depth of the original bedrock layer. During cleanup, Enbridge will use

rock pickers or other rock removal equipment to remove rocks of a greater size and density on the right-of-way than undisturbed areas adjacent to the right-of-way.

6.3 GEOLOGY AND GROUNDWATER

6.3.1 Mineral Resources

The USGS maintains the Mineral Resources Data System, which is a collection of metallic and nonmetallic mineral resource reports (USGS 2005). According to the Mineral Resources Data System, there are six surficial sand and gravel points within 0.5 mile of the Project centerline. These points are located between approximate MP 17 to 20 of the Project route. Based on a review of the data and aerial photography, three of these points appear to be active producers and are located approximately 800 feet northeast of MP 18.6, 2,400 feet southwest of MP 18.7, and 1,600 feet north of MP 19.7. Enbridge is consulting with the respective landowner's of these facilities to minimize impact to the operations of these facilities.

6.3.2 Paleontology

Based on the thickness of the unconsolidated glacial material in the Project area, significant paleontological resources are not likely to occur. Despite the fact that glacial deposits are of Pleistocene age, megafauna fossils tend to be scarce where glacial ice was present (Paleontology Society 2019). While the potential for discovery is low, Enbridge's environmental inspectors will be instructed to take note of significant paleontological materials (e.g., fossilized vertebrate remains, such as bones or teeth) encountered during clearing, grading, or trenching operations. .

6.3.3 Public Water Supply Wells

The WDNR maintains a database that identifies township sections with high capacity wells constructed and available for use as well as currently registered high-capacity surface water withdrawals. The point location of these features is not publically available; however, general information is available on a township section level. Based on a review of the database (WDNR 2019v), the Project centerline crosses, or is within 0.5 mile of, five township sections identified as having high-capacity water withdrawal features.

6.3.4 Private Water Supply Wells

Based on a review of wells drilled since 1988, the Project centerline is within 150 feet of 32 private water wells (Wisconsin Geological and Natural History Survey 2019). Prior to construction, Enbridge will consult with landowners to determine the location of any water wells within approximately 100 feet of the Project workspace. Enbridge will conduct preconstruction water testing of these private wells, as requested by each individual landowner. Enbridge will prohibit refueling, maintenance, lubricating operations, and concrete coating activities within 100 feet of water supply wells.

6.3.5 Federal and State Designated Aquifers

The Project route will not cross any USEPA-designated sole-source aquifers, since none occur in the State of Wisconsin (USEPA 2014).

6.3.6 Contaminated Soil and Groundwater

Enbridge accessed the WDNR's Remediation and Redevelopment Database (WDNR 2019t) through the WDNR Open Data portal (WDNR 2019q) to identify contaminated sites within 0.5 mile of the Project. This database includes completed and ongoing investigations and cleanups of contaminated soil and/or

groundwater; public registry of sites with residual soil or groundwater contamination, or where continuing obligations have been put in place; cleanup of sites under the federal Superfund statute; liability exemptions and clarifications at contaminated properties (i.e., brownfields); and information on WDNR funding assistance. Enbridge removed closed sites with completed cleanup from consideration. Open sites and closed sites with continuing obligations within 0.5 mile of the Project were considered in this analysis. Enbridge did not identify any open sites within 0.5 mile of the Project.

Sites with continuing obligation are approved cleanups that have residual contamination. The state of Wisconsin allows some residual contamination above state standards to remain after a cleanup of contaminated soil or groundwater is complete, provided the residual contaminates are not a public health hazard. The continuing obligations are certain actions for which property owners are legally responsible and transferred when the property changes ownership. The two most common obligations are i) proper management of contaminated soils during excavation and ii) obtaining approval before construction of water wells, though property-specific obligations may apply. Enbridge identified four closed sites with continuing obligations within 0.5 mile of the Project. These sites are located approximately 2,195 feet southwest of temporary access road 002, 955 feet north of temporary access road 024, 60 feet south of temporary access road 051.01, and 2,540 feet south of temporary access road 051.01. Because these sites have been adequately remediated and are outside of the Project workspace, impacts are not anticipated.

6.3.7 General Construction and Operation Impacts and Mitigation

The overall effects of construction and operation of the proposed Project on topography and geology will be minor. Primary impacts will be limited to construction activities and will include temporary disturbance to slopes within the rights-of-way resulting from grading and trenching operations. Enbridge will minimize impacts by returning contours to preconstruction conditions to the maximum extent practicable. Construction activities, such as trenching, backfilling, and dewatering, that encounter shallow surficial aquifers may result in minor short-term fluctuations in groundwater levels within the aquifer; however, the groundwater levels will typically recover quickly following construction.

6.3.7.1 Blasting

Blasting to install the pipeline in a bedrock aquifer has the potential to affect water quality and water yields in nearby water wells. Due to shallow lithic bedrock being present within the Project workspace, blasting may be necessary. Enbridge will implement the protective measures outlined in the Blasting Plan (refer to Attachment D filed on February 11, 2020).

6.3.7.2 Steep Slopes

Steep slopes increase the risk of soil movement during and after construction due to soil erosion, reduced revegetation success, and landslides. The Project centerline will cross approximately 2.0 miles of terrain with slopes greater than 20 percent, as shown in Table 6.3.7-1 and Attachment G-1. Enbridge will install permanent trench breakers and permanent slope breakers in areas of steep slopes. Trench breakers are designed to prevent preferential water flow along the pipeline trench by diverting subsurface water flow to the land surface. Groundwater discharging at the land surface is then redirected off the rights-of-way by the slope breakers. Used in combination, these structures prevent subsurface piping of soils that can lead to slope instability and failure. Additional erosion control measures approved by the Environmental Inspector may be used on steep slopes to help stabilize the construction work areas, minimize erosion, and support revegetation. Enbridge will implement the measures outlined in its EPP to successfully revegetate disturbed areas, such as conducting temporary seeding on steep slopes or other areas with a high risk of erosion, and prompt restoration following construction activities.

Table 6.3.7-1: Slopes Greater than 20 Percent along the Proposed Pipeline Route [a, b]

Approximate Milepost Beginning	Approximate Milepost Ending	Crossing Length (feet)	Approximate Milepost Beginning	Approximate Milepost Ending	Crossing Length (feet)
0.61	0.62	70	17.23	17.24	69
0.63	0.64	64	17.27	17.28	82
2.90	2.91	50	17.86	17.88	133
2.92	2.93	55	18.99	19.00	44
3.77	3.83	296	19.02	19.07	254
3.83	3.94	608	19.13	19.13	16
3.95	3.96	38	19.20	19.22	59
3.97	3.98	90	19.22	19.25	158
4.03	4.03	40	19.26	19.29	175
4.16	4.17	53	19.31	19.33	86
4.19	4.21	71	19.80	19.81	74
4.21	4.23	106	19.84	19.87	142
4.25	4.30	264	20.94	20.95	55
4.67	4.70	178	21.15	21.17	79
5.04	5.05	66	21.69	21.69	20
5.06	5.07	63	22.01	22.02	53
5.81	5.82	53	22.24	22.25	53
5.91	5.92	55	22.25	22.26	42
5.93	5.94	67	22.28	22.29	82
6.30	6.33	123	22.45	22.45	43
6.35	6.40	270	22.47	22.49	106
7.04	7.05	42	23.76	23.81	264
7.06	7.07	45	24.04	24.05	57
7.98	7.99	53	24.17	24.18	30
8.00	8.02	85	24.38	24.39	53
11.23	11.24	39	24.51	24.52	18
11.39	11.39	32	24.82	24.87	240
11.40	11.41	80	24.89	24.91	115
12.41	12.43	74	24.97	24.98	82
12.44	12.46	84	25.03	25.04	64
12.72	12.74	65	25.08	25.10	137
12.76	12.77	67	25.26	25.33	356
14.07	14.10	158	25.36	25.38	82
14.30	14.32	106	25.39	25.41	134
14.70	14.72	113	25.42	25.43	56
14.74	14.76	93	25.58	25.59	52
14.95	14.96	33	25.64	25.67	180
14.96	14.97	32	25.68	25.69	60
15.16	15.17	53	25.72	25.73	31
15.17	15.18	53	25.79	25.80	55
15.19	15.21	107	27.12	27.12	46
15.25	15.25	31	27.93	27.94	29
15.26	15.27	59	30.91	30.92	88
15.29	15.30	60	31.33	31.34	53
15.84	15.85	78	31.40	31.41	40
15.87	15.88	73	31.73	31.74	45

Approximate Milepost Beginning	Approximate Milepost Ending	Crossing Length (feet)	Approximate Milepost Beginning	Approximate Milepost Ending	Crossing Length (feet)
15.91	15.92	43	31.77	31.77	34
15.92	15.93	43	32.63	32.64	53
16.17	16.18	35	34.09	34.10	53
16.53	16.55	98	36.84	36.86	106
16.58	16.59	26	37.40	37.40	24
16.66	16.69	158	37.73	37.73	25
16.74	16.75	57	37.86	37.88	134
16.76	16.77	45	38.33	38.35	99
16.77	16.78	61	38.99	39.00	46
16.93	16.93	33	39.02	39.03	51
16.94	16.95	34	39.23	39.24	41
17.07	17.08	46	39.53	39.56	158
17.09	17.09	29	39.60	39.64	215
				Total	10,334

Notes:

[a] Analysis of digital elevation model data converted to slope for Ashland and Iron counties along the Project centerline (University of Wisconsin Madison Space Science and Engineering Center 2019a; 2019b)

[b] Slopes that are over 20 percent, but less than 20 feet in length, are omitted from the analysis. These slopes are likely the result of stream banks, roadside ditches, or other irregularities.

6.3.7.3 Spills and Leaks

The introduction of contaminants into groundwater due to accidental spills of construction-related chemicals, fuels, or hydraulic fluid during construction could have an adverse effect on groundwater quality, most notably near shallow water wells. Spill-related impacts from pipeline construction are primarily associated with fuel storage, equipment refueling, and equipment maintenance (refer to Section 4.8). Enbridge's EPP (refer to Attachment D filed on February 11, 2020) includes measures to prevent accidental releases of fuels and other hazardous substances associated with construction activities. The EPP also describes response, containment, and cleanup procedures. By implementing the protective measures set forth in the EPP, long-term contamination due to construction activities should not occur.

6.4 SURFACE WATERS AND WETLANDS

6.4.1 Surface Waters

At the time of the February 11, 2020 application submittal, Enbridge had completed wetland and waterbody surveys of approximately 70 percent of the proposed Project work areas. Since the February 11, 2020 application submittal, Enbridge has completed the remaining wetland and waterbody surveys along the Project route. Enbridge is submitting an addendum to the 2019 Wetland and Waterbody Survey Report that includes information collected during the 2020 field season. The addendum wetland and waterbody delineation report for the 2020 surveys that includes representative photographs, data sheets, and maps is provided as Attachment C-1 in the Supplemental Application Information. Wetland and waterbody locations are shown on the aerial maps provided as Attachment B of the Supplemental Application Information. Attachment H includes a wetland and waterbody crossing table identifying Project impacts. Enbridge classified linear waterbodies into one of three regimes according to the definitions provided by the USACE for the Nationwide Permit Program in 33 CFR Part 330. A summary of waterbodies crossed by the pipeline centerline is in Table 6.4.1-1.

Table 6.4.1-1 Summary of Pipeline Centerline Waterbody Crossings

Waterbody Regime	Number
Delineated Waterbodies	
Perennial	29
Intermittent	37
Ephemeral	31
PROJECT TOTAL	97

Notes: Notes: Delineated waterbodies are based on 2019 and 2020 field surveys. Includes rivers, streams, swales, and ditches. Includes one WDNR 24K Hydrography Data waterway (WDH-18) where survey was not permitted in a highway median and 17 WDH waterbodies where a navigability determination by WDNR is requested.

Attachment H identifies the specific waterbody crossing methods Enbridge proposes to implement at each waterbody. Additional details are provided in Enbridge's EPP (refer to Attachment D filed on February 11, 2020).

Watersheds

The Project will cross eight watersheds within the Lake Superior Basin. Project crossing lengths through the watersheds is provided in Table 6.4.1-2 (refer to Figure 5.4.1-1).

Table 6.4.1-2: Watershed Boundaries Crossed by the Project

Major Basin	Watershed	WDNR Watershed Code	Milepost In	Milepost Out	Crossing Length (miles)
Lake Superior	Fish Creek	LS08	0.0	1.2	1.2
	Lower Bad River	LS09	1.2	3.3	2.2
	White River	LS10	3.3	7.4	4.0
	Marengo River	LS12	7.4	21.9	14.6
	Upper Bad River	LS14	21.9	26.4	4.4
	Tyler Forks	LS13	26.4	34.2	7.8
	Potato River	LS11	34.2	40.3	6.1
	Montreal River	LS15	40.3	41.1	0.8

Notes: WDNR = Wisconsin Department of Natural Resources

Sensitive or Protected Waterbodies

The WDNR developed special designations for sensitive or protected waterbodies as follows:

- Areas of Special Natural Resource Interest—Includes trout streams; outstanding or exceptional resource waters; waters inhabited by endangered, threatened, or species of special concern; wild and scenic rivers; and more.

- Public Rights Features ("PRF")—Waterbodies with sensitive areas, such as fish and wildlife habitat necessary for breeding, nesting, nursery, and feeding, as well as physical features that ensure protection of water quality; areas navigated by recreational watercraft used in such activities as boating, angling, hunting, or enjoying natural beauty.

- Priority Navigable Waters—A navigable waterway (or a portion of one) that is identified as either an outstanding or exceptional resource water, a trout stream, a lake that is less than 50 acres in size, or waters that the WDNR determined contain sensitive fish and aquatic habitat. This category can also include waterbodies classified as ASNRI and PRF.

The Project does not cross PRF waterbodies; however, as detailed in Attachment H, the Project crosses eighteen ASNRI-designated Priority Navigable Waters waterbodies.

Impaired Waters

There are several 303(d) impaired lakes, impoundments, and a few rivers within the Lake Superior Coastal and North Central Forest ecological landscapes, most of which are due to atmospheric deposition of mercury (WDNR 2015). Project activities are not anticipated to contribute to the impairments of the three impaired waterbodies crossed by the Project.

6.4.1.1 General Impacts and Mitigation

Pipeline construction across waterbodies could result in short-term or long-term impacts. Installation of a pipeline across a stream or river can temporarily displace stream bottom sediments and increase erosion of soils adjacent to the waterbody. The magnitude and duration of these effects depends on the soils and topography of the site and the proposed crossing method. Construction could also change the stream bottom profile, resulting in increased siltation or erosion at the site or further downstream. Enbridge developed the measures outlined in the EPP to minimize short- and long-term impacts on the waterbodies during and following pipeline construction.

Long-term impacts on water quality could result from alteration of stream banks and removal of riparian vegetation. Soil erosion associated with surface runoff and stream bank sloughing could result in the deposition of sediments in waterbodies. Removal of riparian vegetation could lead to increased light penetration into the waterbody, causing increased water temperature that could potentially impact fisheries.

Enbridge would avoid and minimize impacts on waterbodies by implementing measures described in its EPP. Enbridge would also limit the duration of construction within waterbodies and limit equipment operation within waterbodies to the area necessary to complete the crossing. Enbridge will restore and stabilize disturbed areas at crossings as soon as practical after pipeline installation. Waterbody crossing plans for waterbodies which may require special restoration considerations are included in Attachment N.

Water withdrawals for hydrostatic testing of the pipeline (see section 4.3.11) and HDDs (see section 4.5) would occur from surface waterbodies. An updated list of water sources for hydrostatic testing and HDD is included in the Draft Hydrotest Plan in Attachment K. During water appropriation, the intake hose will be equipped with a screen to prevent fish uptake and suspended off the stream bottom. To minimize the potential for introduction and/or spread of invasive species due to hydrostatic testing activities, Enbridge will discharge the hydrotest water to the same source location. If water is used to test multiple test sections, it will be relayed back to the source water through the pipeline for final discharge (unless specified otherwise in applicable permits).

Spills from refueling operations, fuel storage, or equipment failure in or near a waterbody could affect aquatic resources and contaminate the waterbody downstream of the release point. Enbridge would minimize the potential impact of spills of hazardous materials by implementing the measures described in the Spill Prevention, Containment, and Control section of its EPP (Attachment D filed on February 11, 2020).

Enbridge has identified nine streams where in-water blasting may be necessary to install the pipeline. An updated list of waterbodies where blasting is anticipated is in Attachment H.

Operation and maintenance of the Project would not result in long-term effects on water quality. Enbridge would periodically inspect the pipeline right-of-way from vehicles and perform routine removal of brush and trees; however, little disturbance is expected within the permanent right-of-way.

6.4.2 Wetlands

At the time of the February 11, 2020 application submittal, Enbridge had completed wetland and waterbody surveys of approximately 70 percent of the proposed Project work areas. Since the February 11, 2020 application submittal, Enbridge has completed the remaining wetland and waterbody surveys along the Project route. Enbridge is submitting an addendum to the 2019 Wetland and Waterbody Survey Report that includes information collected during the 2020 field season. The addendum wetland and waterbody delineation report for the 2020 surveys that includes representative photographs, data sheets, and maps is provided as Attachment C-1 in the Supplemental Application Information. Wetland and waterbody locations are shown on the aerial maps provided as Attachment B of the Supplemental Application Information. Attachment H includes a wetland and waterbody crossing table identifying Project impacts. Enbridge based the wetland delineations on the criteria and methods outlined in the following documents:

- *United States Army Corps of Engineers Wetlands Delineation Manual,* Technical Report Y-87-1 (1987) and subsequent guidance documents (USACE 1991; USACE 1992)
- Guidelines for Submitting Wetland Delineations in Wisconsin to the St. Paul District Corps of Engineers (USACE 2015)
- *Basic Guide to Wisconsin's Wetlands and Their Boundaries* (Wisconsin Department of Administration Coastal Management Program 1995)
- Applicable Regional Supplements to the Corps of Engineers Wetland Delineation Manual.

6.4.2.1 General Wetland Impacts

The primary impact of pipeline construction and right-of-way maintenance activities on wetlands will be the temporary removal of wetland vegetation. Construction will also temporarily diminish the recreational and aesthetic value of the wetlands crossed. These effects will be greatest during and immediately following construction. In emergent wetlands, the impact of construction will be relatively brief, since herbaceous vegetation will typically regenerate within one or two growing seasons. In forested and shrub-dominated wetlands, the impact will last longer due to the longer recovery period of these vegetation types. Clearing of wetland vegetation will also temporarily remove or alter wetland wildlife habitat. In areas where the pipeline is collocated with other utilities or roads in wetlands, the minor effect on those wetlands due to a small increase in the corridor width would not cause a loss of wetland functional values.

Typical pipeline construction in most wetlands will be similar to construction in uplands and will consist of clearing, trenching, dewatering, installation, backfilling, cleanup, and revegetation. However, due to the unstable nature of some wetland soils, construction activities may differ somewhat from standard upland procedures. Additional details are provided in the EPP (refer to Attachment D filed on February 11, 2020). Areas within wetlands that may require blasting due to shallow bedrock are provided in Attachment H.

Enbridge will control the growth of trees and shrubs within the permanent maintained right-of-way to facilitate aerial inspections and operational maintenance which will result in a conversion of forested wetlands and scrub-shrub wetlands to emergent wetlands within the permanent right-of-way (refer to Table 6.4.2-1).

No permanent resource impacts (e.g., wetland fill) will be required for the mainline block valve aboveground facilities; however, approximately 998 square feet (0.02 acre) of total permanent wetland fill will be required for the establishment of the permanent access roads into the valve sites.

Table 6.4.2-1 Summary of Project Wetland Impacts

Wetland Type [a]	Temporary Impacts (acres) [b]	Permanent Conversion (acres) [c]	Permanent Fill (acres) [d]
Delineated Wetlands			
PEM	28.5	0	0.02
PFO	64.5	30.0	0
PSS	10.1	3.9	<0.01
PROJECT TOTAL [e]	**103.1**	**33.9**	**0.02**

Notes:

[a] Delineated wetlands are based on 2019 and 2020 field surveys.

[b] Includes temporary impacts associated with pipeline workspace, access roads, and pipe yards.

[c] Permanent conversion impacts include acreage within PFO and PSS wetlands that will be maintained as PEM within the permanent right-of-way.

[d] Permanent fill impacts include wetland acreage that will be impacted by construction of permanent aboveground structures and an associated access road.

[e] The sum of the addends may not equal the totals in all cases due to rounding.

PEM = Palustrine Emergent; PSS=Palustrine Scrub Shrub; PFO = Palustrine Forested

Temporary Access Road Wetland Impact

As previously stated, Enbridge typically uses existing public and private roads to access the right-of-way and facilities to the extent practicable to limit impacts on WOUS (refer to section 4.2.3). However, Enbridge identified areas along the Project where new temporary access roads will be necessary for pipeline construction. This will result in approximately 14 acres of temporary wetland impacts.

6.4.2.2 Wetland Mitigation

To the maximum extent practicable, Enbridge will restore affected wetlands to preconstruction conditions, which is considered in-place compensation, but not in-kind and not in-advance (refer to section 4.6.2). Enbridge is proposing to provide compensatory wetland mitigation for unavoidable Project-related wetland type permanent fill and conversion of scrub-shrub and forested wetlands as well as temporal loss. In applying the in-kind and in-advance factors, Enbridge proposes to use baseline compensation ratios for impacts to emergent, forested, and scrub-shrub wetland types used for previous Enbridge pipeline projects. Enbridge will continue to work with the WDNR and the USACE to consider additional factors that may result in adjustment of baseline compensation ratios.

Enbridge proposes to use USACE/WDNR approved Compensatory Mitigation Banks, and potentially the Wisconsin Wetland Conservation Trust in-lieu fee program, to compensate for unavoidable Project wetland impacts. Before deciding to propose use of the in-lieu fee program, Enbridge reviewed the USACE Regulatory In-lieu Fee and Bank Information Tracking System for available wetland mitigation bank options. Based on this information, Enbridge determined there are potential wetland mitigation bank credits

available in the Poplar River Mitigation Bank that could at least partially satisfy likely Project compensatory mitigation requirements.

The Project will cross the following hydrologic unit codes ("HUC" 8) in the Lake Superior and Chippewa Bank Service Area in Ashland and Iron Counties:

- 04010301; Beartrap-Nemadji
- 04010302; Bad-Montreal

The Lake Superior Service Area and Chippewa Bank Service Area watersheds, as defined in the in-lieu fee program, are consistent with those utilized for mitigation banking and permittee responsible mitigation. By providing compensatory mitigation within the same Bank Service Area, the Project will meet the goal of providing mitigation "in-place." Enbridge continues to work with the WDNR and USACE on wetland mitigation and post-construction monitoring.

6.5 VEGETATION, WILDLIFE, AND FISHERIES

6.5.1 Vegetation

Existing Vegetation Resources

As shown in Table 6.6-1, most of the area impacted by the construction right-of-way is broad-leaved deciduous forest, followed by croplands and grasslands. During operation, regular vegetation maintenance in the permanent right-of-way will be necessary to provide access for pipeline inspections and repairs. Most of the area impacted by operational maintenance is forest, grassland, and agricultural land. Additional vegetative cover types (in descending order of prevalence) include coniferous forest, forested wetland, and developed land. The approximate acreage within the Project area for each mapped Wisconsin land use type is shown in Table 6.6-1.

Natural Communities

Based on NHI review, there is one terrestrial Natural Community (Boreal Forest) within 1 mile of the Project, and one aquatic Natural Community (Ephemeral Pond) within 2 miles of the Project. The Project will not cross either of the documented natural communities; therefore, impacts are not anticipated. General impacts on vegetation are discussed in section 6.5.1.2.

6.5.1.1 General Construction and Operation Impacts and Mitigation

Clearing of herbaceous vegetation during construction will result in a short-term impact to vegetation. Active revegetation measures and rapid colonization by annual and perennial herbaceous species in the disturbed areas will restore most vegetative cover within the first growing season. Clearing of woody shrubs and trees will be the primary long-term impact on vegetation associated with the Project. Enbridge will allow woody shrubs and trees to recolonize the temporary construction right-of-way and extra workspaces as described in the EPP (Attachment D filed on February 11, 2020). However, recolonization of disturbed areas by woody shrubs and trees will be slower than herbaceous species. As natural succession proceeds in these areas, the early successional or forested communities present before construction will eventually reestablish. Enbridge will employ BMPs to control the spread of noxious weeds and invasive plant species as described in the EPP (Attachment D filed on February 11, 2020).

Clearing trees in the construction right-of-way could affect undisturbed forest vegetation growing along the edges of the cleared areas. By exposing some edge trees to elevated levels of sunlight and wind, evaporation

rates and the probability of tree knockdown could increase. Due to the increased light levels penetrating the previously shaded interior, shade-intolerant species will be able to grow, and the species composition of the newly created forest edge will likely change. The proposed clearing could also temporarily reduce local competition for available soil moisture and light and may allow some early successional species to become established and persist on the edge of the undisturbed areas adjacent to the site.

The Project will result in the clearing of forestland during construction and a portion of this forestland will be maintained clear of trees for operational purposes, including facilitating aerial inspections, preserving pipeline integrity, and providing access for maintenance or emergency work in compliance with federal regulations.

Enbridge will minimize impacts on vegetation adjacent to the Project area through adherence to soil erosion control measures and by confining clearing activities to the approved Project workspaces. To prevent damage to adjacent trees, Enbridge will fell trees into the construction right-of-way. Upon completion of construction, Enbridge will revegetate disturbed areas in accordance with the EPP (refer to Attachment D filed on February 11, 2020) unless otherwise directed by landowners or land managing agencies. Timely restoration of the construction right-of-way and reseeding with an appropriate seed mix will minimize the duration of vegetative disturbance.

6.5.2 Wildlife

As described in Section 6.6.1, the Project will primarily impact forestlands and grasslands, though shrublands, open lands, which include herbaceous areas, and agricultural land may also be affected. The actual occurrence of wildlife species along the Project route depends on the availability of suitable habitat.

6.5.2.1 Sensitive Wildlife Species and Habitats

Migratory Birds and Bald Eagles

Per the NHI data, there are two migratory bird concentration sites within 2 miles of the Project; however, both sites are at least 0.5 mile away from the Project workspace and will not be crossed by the Project itself. Impacts to the migratory bird concentration sites as a result of the Project are not anticipated. It is possible that construction, operation, and maintenance of the Project could result in impacts on migratory birds. Potential impacts on nesting migratory bird species include direct impacts on nesting birds; noise generated during construction which could disturb nesting birds, if present; habitat fragmentation; and loss of wooded habitat, including temporary removal of vegetation, which could cause nesting species to relocate to other suitable habitats.

During 2019 wetland surveys, field teams would report any incidental observations of raptor stick nests or rare species. The *2019 Habitat Assessment Report* was provided to the WDNR separately and is included in Attachment O. Aerial surveys for bald eagle nests were completed in 2020.

During 2019 field surveys, field teams observed bald eagles (*Haliaeetus leucocephalus*) near project MP 2.6 on October 30 and 31. They observed three adults in the area over the course of two days. An NHI-mapped bald eagle nest is located approximately 2.1 miles southwest of this location on Rock Creek, a tributary of the White River. Additionally, per the NHI data, a bald eagle nest is mapped 0.12 mile (1,108 feet) from MP 33.9. Though the species is no longer included on the endangered species list, it is protected by the Migratory Bird Treaty Act and by the Bald and Golden Eagle Act. Bald eagles are found near large bodies of water, such as rivers and reservoirs, where they can obtain fish, their favored food item. Nesting occurs in large trees that can support the weight of their extensive nests. During the winter, bald eagles

gather to roost in groves of trees near open water (USFWS 2019c). The NHI buffer associated with the bald eagle nest identified in the NHI database (identified in 2018) was evaluated by the aerial surveys, including the area of overlap with the survey corridor, which included a 1,000-foot-wide buffer applied to the Project centerline. No nests were detected within the evaluated survey buffer. Bald eagle (*Haliaeetus leucocephalus*) surveys were conducted in 2020, and the *2020 Bald Eagle Nest Surveys Report* was is included in Attachment O. Aerial bald eagle nest surveys were conducted on April 25, 2020 and resulted in the documentation of two raptor stick nests. The first nest was an active bald eagle nest occupied by an adult and at least one chick. The second nest was occupied by a great horned owl (*Bubo virginianus*). The active bald eagle nest observed during 2020 surveys was greater than 660 feet away from the Project workspace or access roads; therefore, in accordance with the *National Bald Eagle Management Guidelines* (USFWS 2007), there will be no impact on nesting bald eagles.

The clearing phase of construction has the greatest potential for impacts if conducted during the nesting season. Construction in agricultural and other open areas are likely to have the least impact as nesting densities are typically lower in areas with a regular disturbance regime and disturbance of nesting habitat will only be temporary. Take of, or direct impacts on, migratory birds are not expected due to the timing of vegetation clearing activities. Vegetation clearing activities associated with construction of the Project are anticipated to be scheduled to occur outside the migratory and nesting seasons for most migratory birds in the region (e.g., April 1 to July 15). Impacts from vegetation clearing on migratory bird species requiring contiguous forested patches are important because nesting densities tend to be higher in these habitats. Various disturbance events often create habitat for shrubland species, so impacts in these areas are generally expected to be less than in forested lands. Some bird species that use open or shrubland habitats could benefit from the habitat conditions created by the proposed Project in the maintained right-of-way.

While Enbridge will comply with the MBTA, activities required for construction have the potential to affect migratory bird habitats. Additionally, Enbridge will implement, as practicable, other measures to avoid and minimize such impacts, such as clearing outside of the nesting season and implementing activity buffers around active bald eagle nests. Despite these efforts, construction and operation of the Project will result in the permanent loss of some forested nesting habitat, most notably deciduous and coniferous forests. After construction is complete, Enbridge will restore the construction right-of-way as near as practicable to preconstruction condition. Cropland will be restored to active agricultural production, and other areas will be revegetated using methods and seed mixes appropriate to existing land uses and cover types. Forested areas outside of the maintained operational easement will be allowed to reforest by succession and natural recruitment. Enbridge anticipates that the majority of the temporary use areas will recover to pre-disturbance conditions over time.

6.5.2.2 General Construction and Operation Impacts and Mitigation

Enbridge does not expect the construction and operation of the Project to have a significant impact on mammals, birds, reptiles, amphibians, or invertebrates. Temporary impacts will occur during construction due to clearing of vegetation and disturbance in the right-of-way. To the greatest extent practicable, Enbridge will avoid clearing vegetation from April 1 to July 15 and activities would be avoided within 660 feet of the Project workspaces from mid-January through August (or when the nest was actively being used) at any identified bald eagle nests.

Clearing the construction right-of-way will remove vegetative cover and will cause temporary displacement of wildlife species along the proposed route. The construction right-of-way and extra workspaces will remain relatively clear of vegetation until restoration occurs. Some smaller, less mobile animals, such as amphibians, reptiles, and small mammals, may experience direct mortality during clearing and grading activities. Larger and more mobile animals will disperse from the Project area during construction.

Displaced individuals may temporarily occupy adjacent, undisturbed areas, possibly causing increased competition with other individuals in those areas. Some individuals may return to their previously occupied habitats after construction is complete and suitable habitat has become reestablished. The intensity of construction-related disturbances will depend on the particular species and the time of year during construction.

Clearing of herbaceous and shrub communities in the open areas of the temporary right-of-way, both in upland and wetland areas, will cause a short-term impact due to the relatively quick recolonization of plant species that comprise these communities. Enbridge will utilize herbaceous seed mixes on disturbed areas following the completion of pipeline construction. Enbridge expects that pre-existing herbaceous and shrub habitats will quickly become reestablished and that wildlife species that use these habitats will return relatively soon after construction. Enbridge will employ BMPs included in its EPP (refer to Attachment D filed on February 11, 2020) to limit the introduction or spread of invasive plant species.

Enbridge will allow forested areas outside of the permanently maintained right-of-way to revegetate naturally with tree and shrub species common to the area. There will be medium-term impacts on wildlife that use forests, due to the conversion of previously forested habitat to herbaceous-dominated habitat on the temporary construction right-of-way. Over time, natural growth and succession will restore the temporary portion of the construction right-of-way and extra workspaces to a forested community, with wildlife typical of forest habitats returning.

The Project will involve the permanent removal of forested habitat within the operationally maintained right-of-way, which will be converted to non-forest habitat for the life of the pipeline. Enbridge will minimize long-term impacts on wildlife species inhabiting undisturbed forests in areas where the Project parallels existing, maintained rights-of-way. Enbridge anticipates that the incremental loss of this narrow corridor of forested habitat along the existing cleared right-of-way is not anticipated to have a significant effect on wildlife species or their habitats.

6.5.3 Fisheries

The Project will cross the Bad, Marengo, Potato, and White Rivers, tributaries of those rivers, and other intermittent, ephemeral streams or ditches (refer to Table 6.4.1-1). Additionally, the Project will cross 17 designated trout streams. The Project will cross the White River at MP 4.0, which is outside of the White River Fishery Area State Natural Areas, but is classified as a coldwater trout stream. The White River is one of only eight rivers in Wisconsin with over 40 miles of Class I or II trout waters (WDNR 2019p). Additionally, both the White River and the Bad River support lake sturgeon (*Acipenser fulvescens)* and smallmouth bass (*Micropterus dolomieu*) fisheries. The Bad River also supports a self-sustaining, naturally reproducing muskellunge (*Esox masquinongy*) fishery. The actual occurrence of fish species in these rivers and their tributaries at the Project's proposed waterbody crossing locations depends on the availability of suitable habitat and other factors. Common native and/or game species found in these waterbodies include largemouth bass (*Micropterus salmoides*), black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), catfish (*Siluriformes spp.*), northern pike, and walleye (*Sander vitreus*) (WDNR 2019p).

Sensitive Fish Species and Habitats

According to WDNR online mapping, the Project will cross 27 designated trout streams and their perennial tributaries, as described in Table 6.5.3-1. As shown in Table 6.5.3-1, some features will be crossed more than once, either with the proposed Pipeline centerline or temporary access road.

Table 6.5.3-1: Designated Trout Streams and Their Perennial Tributaries Crossed by the Project

Designated Trout Waters	Trout Stream Classification	Approximate Crossing Location (MP)	Project Component	Proposed Crossing/Bridge Method
White River	CLASS II	4.0	Pipeline	HDD/None
Marengo River	CLASS III	11.4	Pipeline	Direct Bore/None
UNT of Marengo River	CLASS III	8.0*	Pipeline	DC/ Bridge Type B
		13.6*	Pipeline	N/A/Bridge Type A
Brunsweiler River	CLASS III	14.1	Pipeline	HDD/None
UNT of Brunsweiler River	CLASS III	14.7*	Pipeline	DC/Bridge Type B
Trout Brook	CLASS III	16.6	Pipeline	HDD/None
UNT of Trout Brook	CLASS III	15.9*	Pipeline	DC/Bridge Type B
	CLASS III	15.9*	Pipeline	N/A/Bridge Type A
Billy Creek	CLASS I	17.3	Pipeline	HDD/None
UNT of Billy Creek	CLASS I	16.7*	Pipeline	HDD/Bridge Type A
	CLASS I	16.7*	Pipeline	N/A/Bridge Type A
Silver Creek	CLASS II	19.1	Pipeline	HDD/Type C
		19.1	Pipeline	HDD/Type C
		19.2	Pipeline	HDD/Type C
		20.2	Access Road	N/A/Bridge Type C
UNT of Silver Creek	CLASS II	19.1*	Pipeline	HDD/Type A
		19.8*	Access Road	N/A/Bridge Type B
		19.8*	Pipeline	N/A/None
		19.8*	Pipeline	N/A/Bridge Type C
		19.8*	Pipeline	DC/Bridge Type B
		20.6*	Access Road	N/A/Bridge Type A
		20.6*	Pipeline	DC/Bridge Type A
		20.9*	Access Road	N/A/Bridge Type A
		20.9*	Access Road	N/A/Bridge Type A
		21.3*	Pipeline	DC/Bridge Type A
Krause Creek	CLASS I	22.3	Pipeline	HDD/None
UNT of Krause Creek	CLASS I	22.0*	Pipeline	DC/Bridge Type A
Bad River	CLASS III	24.2	Pipeline	HDD/None
UNT of Bad River	CLASS III	23.7*	Pipeline	DC/Bridge Type A
Gehrman Creek	CLASS II	28.7	Access Road	N/A/Bridge Type A
		28.8	Access Road	N/A/Bridge Type A
UNT of Gehrman Creek	CLASS II	28.4*	Pipeline	DC/ Bridge Type A
Camp Four Creek	CLASS II	29.8	Pipeline	OC/DC/Bridge Type B
		29.9	Access Road	N/A/Type B Bridge
Feldcher Creek [a]	CLASS II	31.2	Pipeline	DC/Type A Bridge
		32.2	Access Road	
UNT of Feldcher Creek	CLASS II	30.7*	Pipeline	N/A/Type A Bridge
		30.8*	Access Road	DC/ Type A Bridge
				N/A/Type A Bridge
Tyler Forks	CLASS II	33.4	Access Road	N/A/Type C Bridge
		34.0	Pipeline	HDD/Type C Bridge
Vogue Creek	CLASS II	34.3	Access Road	N/A/Type B Bridge
		34.4	Access Road	N/A/Type A Bridge
Coil Creek	CLASS II	36.6	Access Road	N/A/Type A Bridge
		36.8 [b]	Access Road	N/A/Type B Bridge
Potato River	CLASS II	37.9	Pipeline	HDD/None
UNT of Potato River	CLASS II	37.6*	Access Road	N/A/Bridge Type B

Designated Trout Waters	Trout Stream Classification	Approximate Crossing Location (MP)	Project Component	Proposed Crossing/Bridge Method
Vaughn Creek	CLASS II	39.6	Pipeline	HDD/None
UNT of Vaughn Creek	CLASS II	38.6	Workspace	N/A/Bridge Type A
		39.0*	Pipeline	DC/Bridge Type A

Notes:
* Crossing is of a perennial tributary of designated trout stream.
[a] Recent beaver activity on Feldcher Creek has impounded the waterbody, changing the feature from a stream to a wetland at the project crossing location. No defined channel was visible at the crossing location.
[b] Waterway delineated as a wetland. Pending Navigability Determination from WDNR.
MP – milepost; HDD – Horizontal Directional Drill; OC – Open-Cut; DC - Dry Crossing

6.5.3.1 General Construction and Operation Impacts and Mitigation

Installation of the pipeline across streams may temporarily impact movement of fish upstream and downstream of crossing sites due to disturbances associated with construction. The physical disturbance of the streambed may temporarily displace adult fish and may dislodge other aquatic organisms. Some mortality of less mobile organisms, such as small fish and invertebrates, may occur within the trenching area. Enbridge will remove aquatic plants, woody debris, and boulders that provide instream fish habitat during trenching. Noise disturbances upstream and downstream of the sites will deter fish that may otherwise inhabit the area. These disturbances will be temporary and will not significantly affect fisheries resources.

Water Withdrawals

Water withdrawn from streams and rivers has potential to impact fisheries resources, which include entrainment of larvae and juvenile fish and invertebrates, impingement of fish and other aquatic organisms, and downstream impacts on water levels. As discussed in Section 6.4.1, during water appropriation, the intake hose will be equipped with a screen to prevent fish uptake and suspended off the stream bottom. Additionally, water withdrawn from cold- or warmwater streams has the potential to change temperature during uptake and hydrostatic testing, depending on ambient conditions (e.g., local temperature at time of use, duration of use, etc.). To prevent adverse effects on temperature-sensitive species found in cold- and warmwater streams, Enbridge will withdraw and discharged water in accordance with permit conditions.

Instream Construction

Construction activities within or adjacent to streams and adjacent wetlands could increase turbidity and sedimentation, alter stream channels or substrate composition, alter or remove cover, increase erosion, or degrade habitat. Impacts on fish could include displacement; changes in feeding or breeding behaviors; interference with passage; and stress, injury, or death. The open-cut crossing method will generate the greatest sediment and turbidity, but the elevated levels would be short term and occur over short distances downstream of the crossing. Fish migration through the waterbody during construction may be restricted, but due to the short timeframe for in-stream work, the effect on migrating fish will be minor. Dry crossing methods (e.g. dam and pump, flume) will reduce turbidity and sedimentation impacts on fisheries by isolating the trench area during construction. Temporary bridge placement and removal may also contribute to short-term turbidity increases. Increased sediment loads from open-cut, dry crossings, and bridge placement/removal may temporarily affect the more sensitive fish eggs, fish fry, and invertebrates inhabiting the downstream area. However, the suspended sediment levels will quickly attenuate over both time and distance and will not adversely affect resident fish populations or permanently alter existing habitat

(McKinnon and Hnytka 1988). Enbridge will minimize instream disturbance to the extent practicable to allow suspended sediment levels to return to preconstruction levels upon completion of instream work.

Enbridge proposes to use the HDD crossing method at seven waterbody crossings which minimize potential streambed impacts (refer to Attachment H). While use of the HDD method will minimize impacts on fisheries and fish habitat within and adjacent to these waterbodies, there could be a risk of inadvertent surface releases of drilling fluid. An inadvertent release of drilling fluid into a stream will affect water quality and could smother fish eggs and degrade spawning habitat. Depending on the magnitude of drilling fluid loss and whether drilling fluids escape into the water column, sedimentation of substrates downstream from the release site could occur. If an inadvertent release occurs, Enbridge will implement the corrective action and cleanup measures outlined in the EPP (Attachment D filed on February 11, 2020) to minimize impacts on fishery resources.

Additionally, Enbridge will adhere to the WDNR-recommended timing restrictions for in-water work, as follows, unless otherwise permitted by the WDNR:

- Trout streams (and their perennial tributaries): no instream activity from September 15 through May 15.

- All other waterbodies: No instream activity from March 1 to June 15.

Enbridge anticipates construction will occur between February and August, which could overlap with fishery timing restrictions. Enbridge is requesting timing restriction waivers for bridge placement and removal at the waterbodies listed in Attachment H. A waiver of timing restrictions request form is included in Attachment P.

Streambank vegetation and structure, such as logs, rocks, and undercut banks, provide important fish habitat. Construction through waterbodies (except with HDD) will temporarily remove this habitat, which could displace fish to similar habitat upstream or downstream of the pipeline crossing. Displacement will result in increased competition for habitat and food sources that could affect fish health and survival. After construction, Enbridge will maintain an area over the pipeline in an herbaceous state to facilitate routine aerial inspections. Changes in the light and temperature characteristics of some streams may affect the behavioral patterns of fish, including spawning and feeding activities, at the pipeline crossing locations. The maintained streambanks, however, are not wide enough to have a significant impact on general temperature and light conditions of the affected streams.

Blasting may be required instream at some waterbodies (see Attachment H). Instream blasting would cause increased turbidity and downstream sedimentation and potentially harm fish directly in the blast zone. Sound-related behavioral effects could be caused by explosives used near fish-bearing waterbodies. Using the blasting method (in place of mechanical tools) for rock removal instream would allow the Project to minimize the amount of time required working in the stream and overall disturbance to the feature. Enbridge would implement measures in its Blasting Plan (Attachment E filed on February 11, 2020) to minimize instream impacts.

To minimize the potential for adverse impacts on the fisheries at river and stream crossings from increased turbidity and sedimentation, Enbridge will implement erosion and sediment control measures specified in the EPP (refer to Attachment D filed on February 11, 2020) and limit the duration of construction in waterbodies.

6.5.4 Threatened and Endangered Species

6.5.4.1 Federal Threatened and Endangered Resources

Enbridge initiated coordination on the Project with the Green Bay Ecological Services Field Office (Region 3) of the USFWS in September 2019. Additionally, Enbridge has been coordinating with the USACE. The USACE will initiate Section 7 informal consultation for the Project. Informal consultations with USACE, USFWS, and Enbridge will continue throughout 2020.

Six federally listed species have the potential to occur within the Project area in Ashland, Bayfield and Iron counties (refer to Table 5.5.4-1). None of these species are documented in the NHI data within one mile of the Project; however, the West Fireline [gray wolf] pack has been documented within 1.2 miles of the Project. Designated critical habitat for the piping plover also occurs in Ashland County along the shore of Lake Superior, approximately 6 miles north of the Project at its closest point. As part of formal consultation with the USFWS, Enbridge will assess the potential effects for each species in the Project area by evaluating historic and present occurrences, availability of potential habitat within the Project area, the species' natural history, and results of desktop and field-based habitat assessments and surveys. Enbridge will consult with the USFWS regarding the effects of the proposed activities on each species and whether any species-specific surveys would be recommended in 2020.

Gray Wolf

There was one NHI occurrence of the gray wolf within 1.2 mile of the Project area. Given abundant prey and low rates of human-caused mortality, wolves can survive in proximity to human-dominated environments (Fuller 1989). Noise and/or physical disturbance would prompt wolves to vacate the area for a short period. Enbridge expects the Project's effects, if any, to be minor and temporary. Because the wolf is a mobile species, Enbridge anticipates that any wolf will move away from the local area of disturbance and may begin using the area again shortly after cessation of activities. Construction may temporarily impede wolf movement and displace individuals, but the impact on the wolf population would be minimal.

Canada Lynx

There were no NHI occurrences of Canada lynx within 1 mile of the Project area. Noise and/or physical disturbance would prompt lynx to vacate the area for a short period. Enbridge expects the Project's effects, if any, to be minor and temporary. Because the lynx is a mobile species, Enbridge anticipates that any lynx will move away from the local area of disturbance and may begin using the area again shortly after cessation of activities. Construction may temporarily impede lynx movement and displace individuals, but the impact on the lynx population would be minimal. Den sites are likely to be around downed logs and windfalls in the forest interior away from the cleared pipeline corridor.

Northern Long-Eared Bat

There were no NHI occurrences of northern long-eared bats within 1 mile of the Project area. Potential impacts on the northern long-eared bat may occur if clearing of forested habitat for construction workspace takes place during times of the year and at locations where individuals are breeding, foraging, raising pups, or roosting. Bats may be injured or killed if clearing of occupied trees occurs during the species' active window. Potential mitigation measures may include limiting tree clearing to the winter months when the species is in hibernation and limiting the amount of habitat cleared. There were no NHI occurrences of northern long-eared bats within 2 miles of the Project area.

Piping Plover

There were no NHI occurrences of piping plover within 1 mile of the Project area. The Project is within the interior of Ashland and Iron counties over 1.5 miles from the shoreline of Superior Bay. Impacts are not expected on piping plover form Project activities.

Rufa Red Knot

There were no NHI occurrences of rufa red knot within 1 mile of the Project area. Noise or presence of humans and equipment involved in the Project activities may cause migrating red knots to startle and flush from wetlands or fields or to avoid the area. Construction would temporarily affect some wetlands and cultivated fields that could temporarily affect the foraging and sheltering behaviors of individual migrating red knots.

Fassett's Locoweed

There were no NHI occurrences of Fassett's locoweed within 1 mile of the Project area, and Enbridge did not identify any Fassett's locoweed in the Project area during botanical field surveys. No impacts are expected on the Fassett's locoweed. If the species is identified during botanical surveys in 2020, Enbridge will consult with the USFWS.

6.5.4.2 State Threatened and Endangered Resources

A summary of state protected species surveys completed in 2020 is provided below. Survey reports are included in Attachment O.

Loggerhead Shrike

The NHI occurrence of the loggerhead shrike is less than one mile from the Project and is documented northwest of Minersville Township. Habitat cover within the project ROW consists of a combination of fallow and active agricultural/pasture land and forest edge. This cover type is suitable habitat for the loggerhead shrike, and the potential exists for the species to utilize this area for hunting and nesting. Noise or presence of humans and equipment involved in the Project activities may cause loggerhead shrikes to startle and flush from the forest or fields or to avoid the area. Construction would temporarily affect some cultivated fields that could temporarily affect the foraging and sheltering behaviors of individual shrikes. Some forested areas will be permanently affected by operation of the pipeline (e.g., routine maintenance mowing and clearing of vegetation).

In 2020, surveys were conducted for the loggerhead shrike. The *2020 Loggerhead Shrike Surveys Report* is included in Attachment O. The surveys were conducted in accordance with the guidance provided by the WDNR and survey methods approved by the WDNR. Surveys were concentrated along the proposed pipeline route as well as proposed access roads in potential habitat areas. The Project area in these locations comprised four habitat types, including agricultural fields, old field, mesic hardwood forest, and two-track trails. Each of these habitat types within the survey area was surveyed for the presence of the loggerhead shrike. Surveys for the loggerhead shrike were conducted on May 15–16; May 26–28; and June 11–12, 2020 and did not result in any loggerhead shrike nest or individual observations.

Wood Turtle

There are seven NHI occurrences of the wood turtle within 2 miles of the Project. The Project will cross through areas of suitable wood turtle habitat, and may impact the species. Potential impacts on the wood turtle may occur if clearing of suitable habitat for construction workspace takes place during times of the year and at locations where individuals are overwintering, nesting, or foraging. Turtles may be injured or