Topsoil will be re-spread over areas from which it was removed. Permanent soil stabilization efforts will primarily include revegetation of the Right-of-Way. Fences that were removed during construction will be reconstructed across the Right-of-Way. Figure 4.2.9-2 shows the preparation of the Right-of-Way for the installation of erosion control devices that are used during restoration activities.

Figure 4.2.9-2 Erosion Control

Figure 4.2.9-3 Rock Removal

Disposal of timber, slash, and rock will be in accordance with landowner preferences, applicable regulations, and the EPP (Appendix B). Slash will be stockpiled on the edge of the Right-of-Way, chipped and spread across the Right-of-Way in upland areas, hauled offsite, or burned on-site in accordance with applicable regulations. Excess rock will be stockpiled on-site if requested by the landowner, or disposed of in an alternative, landowner-approved upland area or permitted landfill.

Typically, at waterbody crossings, banks will be restored as near as practicable to preconstruction conditions after backfilling is complete and the separated topsoil has been re-spread within the work areas. The work areas will then be seeded with an appropriate seed mix and covered with an erosion control blanket *(*Figure 4.2.9-4, see also Figure 26 EPP Appendix B). Erosion controls, (e.g. straw bales, biologs, silt fences) will be installed as necessary based on site-specific conditions as detailed in the EPP (Appendix B). Bridges will be removed during final cleanup, or if access is needed, after final cleanup and permanent seeding.

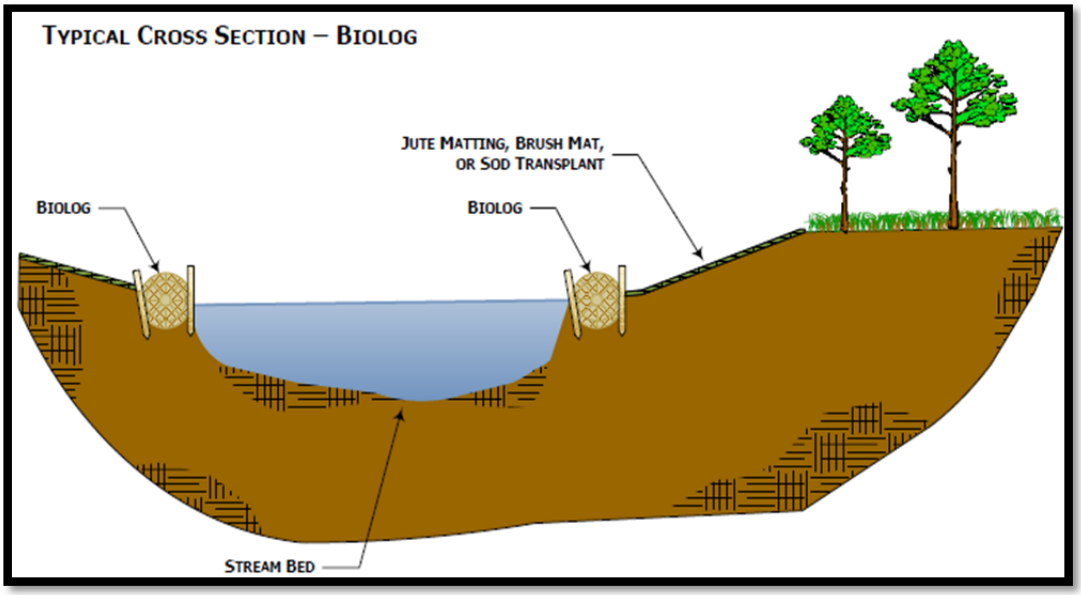

Figure 4.2.9-4 Typical Stream Bank Stabilization – Biolog

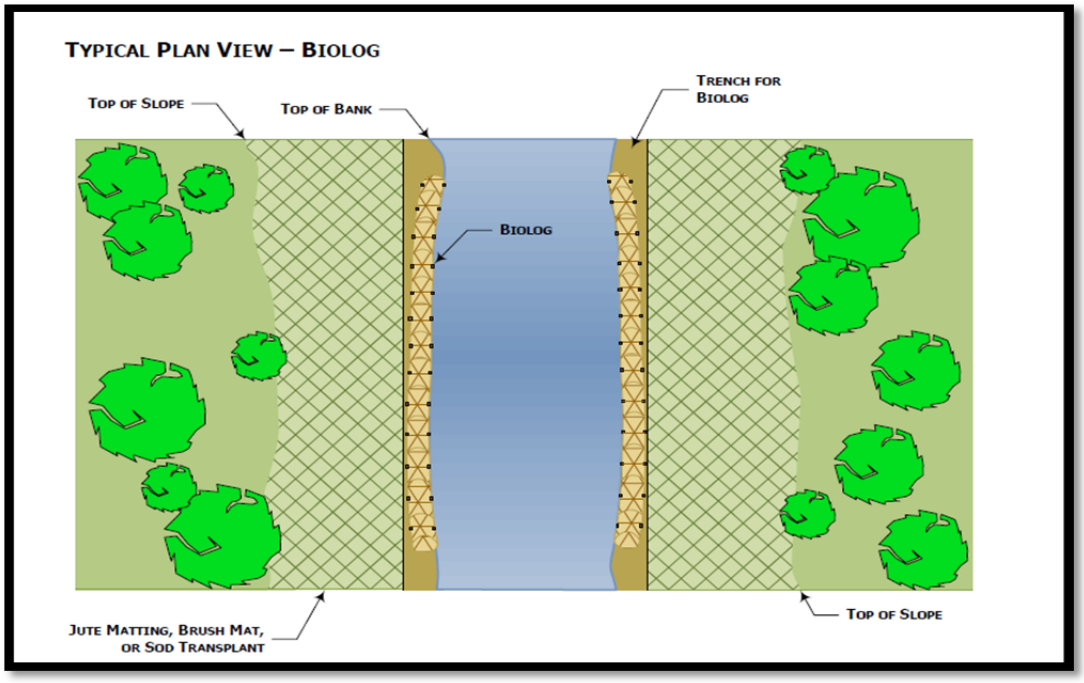

Figure 4.2.9-5 Restored Pipeline

Enbridge will restore original land grade and contours to the extent practicable and will install permanent erosion controls devices to ensure restoration takes place. All disturbed areas will be revegetated in accordance with Enbridge's EPP (Appendix B), permit requirements, and site-specific landowner requests. Enbridge also complies with other federal, state, and local rules and regulations as applicable.

After restoration is complete, Enbridge contacts its affected landowners and/or tenants to discuss any outstanding issues related to the completion of the Project on their respective property. Enbridge will continue to work with each affected party to ensure cleanup and restoration conforms to the easement agreement.

4.3 Operation and Maintenance

As a crude oil pipeline, the Project's design, construction, maintenance, and operation functions are regulated by PHMSA under 49 C.F.R. § Part 195, which governs transportation of hazardous liquids by pipeline. Enbridge abides by all PHMSA regulations and works directly with various regional, state, and local agencies, landowners, tribal, and other stakeholders to ensure that its programs meet the needs of the Community in which it operates.

Figure 4.3-1 Restored Pipeline Right-of-Way

5.0 Route Selection Process

5.1 Project Development Process

Enbridge and the Fond du Lac Band worked together to identify a Preferred Route for the Project that results in minimal human and environmental impacts. As part of the route selection process, Enbridge and the Fond du Lac Band considered: (i) the priorities of the Fond du Lac Band, particularly removing the above-grade mounded pipe, (ii) state criteria where applicable, such as Minnesota Rules Chapter 7852.0700, and (iii) overall environmental, engineering, and economic factors.

Enbridge and Fond du Lac Band agreed to relocate and bury the Project within the Reservation parallel to the existing Enbridge Mainline Corridor. Data collected for the routing analysis within the Fond du Lac Band Reservation shows that 100 percent of this relocation route would run parallel to the Enbridge Mainline System Right-of-Way. Concurrent to this Partial Exemption filing, Fond du Lac Band will be filing a separate letter outlining their support for the Project.

The following sections more fully describe the route selection process that was employed for the Project.

5.2 Development and Application of Routing Criteria

Geographic Requirements

This Project addresses concerns regarding the above-grade Fond du Lac Band Line 4 segment that's creating a barrier to the natural water flow across the Reservation and, in some areas, impedes land access for the Band members to gather medicinal plants and other culturally important resources. Accordingly, Enbridge and Fond du Lac Band focused their route selection process on relocating the approximately 10-mile segment of existing Line 4 between the two existing mainline valve sites located on the Reservation, as shown on Figure 5.2-1 below.

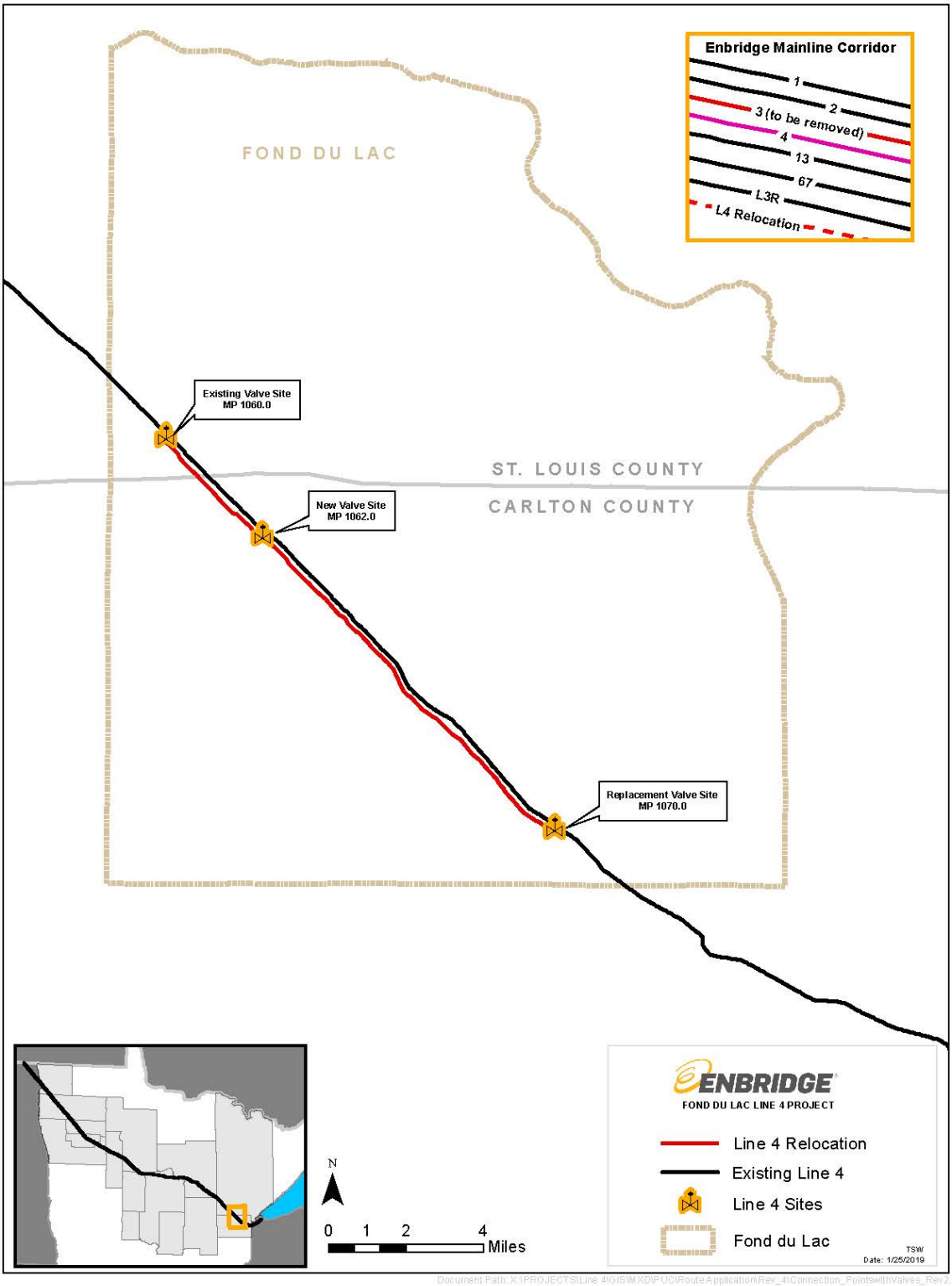

Figure 5.2-1 Project Geographic Requirements

In order to limit impacts to the environment and human settlement and provide the shortest pipeline route to reconnect to the existing Line 4 pipeline, Enbridge and the Fond du Lac Band determined that the relocated Line 4 section would need to be installed within the Fond du Lac Band Reservation and parallel the existing Enbridge Mainline Corridor. This paralleling route would also allow the new Line 4 pipeline to be incorporated into the easement for existing Enbridge pipelines on the Fond du Lac Band Reservation.

Enbridge and the Fond du Lac Band concluded that any route alternative that does not meet the geographic requirements described above, would not meet the purpose of the Project, and therefore such routes were not considered by Enbridge in the development of the Project's Preferred Route.

Other Routing Criteria Considered

After identifying the Project's geographic route requirements, Enbridge and Fond du Lac Band considered other routing criteria, including constraints, opportunities, and technical guidelines, as detailed below.

- **Constraints** - Constraints are features or conditions that could limit or prevent pipeline development. Enbridge works diligently to avoid these features and conditions if at all possible in the siting of its pipeline facilities. Constraints include areas where access or construction is restricted by regulations and areas where impacts on resources would be difficult to mitigate. For this Project, Enbridge tried to avoid: locally-designated environmental protection areas; sensitive habitats; areas with special legal status or where new Right-of-Way cannot be acquired and eminent domain may not be exercised, such as cultural resources; and public infrastructure.
- **Opportunities** - Opportunities are features or conditions that could facilitate project development and avoid or mitigate impacts on human and environmental features. For this Project, the ability to parallel existing Enbridge pipelines was a key consideration in the route selection.
- **Technical Guidelines** – Technical guidelines are the specific engineering requirements and objectives associated with the construction of the Project. For example, one engineering preference is the maintenance of at least 10 feet of separation between centerlines when paralleling existing Enbridge pipelines. Technical guidelines also include federal/state regulatory requirements and guidelines, applicable federal and/or state safety codes and best industry practices.

As demonstrated in this Application, the Project's Preferred Route follows the routing criteria, generally avoids constraints, incorporates opportunities, and applies appropriate technical guidelines.

5.3 Data Collection

Enbridge and Fond du Lac Band have been working together to determine how best to address areas of exposed pipe and above-grade pipe on Line 4 that is creating a barrier to the natural hydraulic flow across the Reservation. In evaluating options, Enbridge and Fond du Lac Band collected and analyzed publicly available environmental data as well as available field data to identify routing constraints and opportunities within the applicable geographic area. The data collection benefited significantly from survey efforts conducted for existing and planned Enbridge work in this area, and continues through various meetings with interested parties and/or consultation with permitting agencies. Such data primarily consists of Geographic Information System digital information layers from the following sources: U.S. Geological Survey (USGS) topographic maps land use database; U.S. Department of Agriculture (USDA) Farm Services Agency aerial photography and geographic information system (GIS) data; National Wetlands Inventory (NWI) maps; Minnesota Department of Natural Resources (MNDNR) National Heritage Information System data; Minnesota Department of Transportation (MNDOT) highway maps; USDA state soil geographic databases; and other natural feature databases obtained from state and federal sources. Enbridge and Fond du Lac Band both have considerable field data available given the proposed sharing of Right-of-Way and paralleling of existing Enbridge Mainline Corridor. All technical guidelines were gathered during the initial engineering design and development phases, and were then incorporated as part of the overall Project scope and continue to be updated as the final engineering design is completed for the proposed Project.

5.4 Evaluation of Relocation Options and Route Variations

As part of the route selection process, Enbridge and the Fond du Lac Band studied a variety of alternatives before selecting relocation along its Preferred Route for this Project. These alternatives consisted of engineering solutions and relocation options along route variations that satisfied the geographic limitations of this Project. During its assessment, Enbridge evaluated and compared several factors while ensuring that it still met the Project's objective in selecting its Preferred Route including:

- The ability to meet Project objectives;
- Constraints;
- Opportunities;
- Technical guidelines;
- Potential environmental impacts;
- Economic feasibility;
- Removal of mounded above-grade pipe; and
- Environmental restoration.

Project Options Considered:

Listed below are the relocation options considered and further evaluated in the Project's route selection process:

- **Option 1:** Relocate individual portions of the existing Line 4 pipeline through segment relocation (see Figure 5.4.1-1);
- **Option 2:** Remediate the existing segment of Line 4 in the same trench by lowering the existing pipe (see Figure 5.4.2-1);
- **Option 3:** Remediate the exposed sections of the existing segment of Line 4 by utilizing the mounding technique (See Figure 5.4.2-1);
- **Option 4:** Relocate the existing segment of Line 4 parallel to the existing Line 2 pipeline within the Fond du Lac Band Reservation (See Figure 5.4.4-1); and
- **Option 5 (Preferred Route):** Relocate the existing segment of Line 4 parallel to the Line 3 Replacement Project within the Fond du Lac Band Reservation (see Figure 5.4.5-1).

5.4.1 Option 1 - Relocate Portions of the Existing Line 4 Pipeline through Multiple Segment Relocations

The scope of this relocation option involves the relocation of three individual exposed pipe segments of existing Line 4 with a 48-inch diameter pipe adjacent to the Line 3 Replacement pipeline, followed by the removal of the original exposed segments of Line 4 (see Figure 5.4.1-1 below for general location). This relocation option does provide an opportunity for Enbridge to reduce the amount of construction needed within the approximate 10 mile segment, as it has contemplated that approximately 1.6 miles of exposed pipe would be relocated under this option. However, this option does not address Fond du Lac's concerns with removing the entire existing above-grade pipe installed on the Reservation. Further, this option, compared to the Preferred Route, creates additional construction constraints, operational risks, and safety risks that exceed any opportunities realized by reducing the amount of construction needed for relocating the pipeline. After applying the routing factors listed above and the criteria for pipeline route selection outlined in the Minnesota Rules Chapter 7852.0700, Enbridge concluded that the relocation of the existing Line 4 pipeline through multiple segment relocations is an inferior alternative and has been rejected for the following reasons.

One of the key drivers for this Project is that Fond du Lac has requested Enbridge remove the existing above-grade pipe from the Reservation. Option 1 would only mitigate the currently exposed sections of pipe and not completely remove the legacy pipe that was installed at the surface. Accordingly, the Fond du Lac Band Community would continue to be impacted by the existing mounded pipeline under Option 1. As noted in the Application the mounded pipeline creates a barrier to the natural water flow and, in some areas, impedes land access for the Band members. This was a significant concern to Fond du Lac Band, as members actively practice traditional activities in this area.

Further, within the Enbridge Mainline Corridor, Line 4 is located in the middle of the multi-pipeline Right-of-Way, where there are a total of six actively operating pipelines. As seen in Figure 5.4.2-2, this is a congested pipeline Right-of-Way where spacing typically ranges between 10-feet and 80-feet on the north side of Line 4, and typically ranges between 25-feet and 100-feet on the south side of Line 4 as it traverses through the Fond du Lac Band Reservation.[1] To relocate the segments of Line 4 to the outside of the corridor, multiple crossings of the other active pipelines would be required. Compared to the Preferred Route, Option 1 has three times more crossings of active pipelines. Option 1 increases the risk of damaging an operating pipeline through accidental contact with equipment, overloads on the surface above the pipelines, and cave-ins.

In addition, due to the limited workspace and the number of existing lines, heavy equipment and spoil would need to be placed directly on top of operating pipelines during construction. Some of these construction impacts could be mitigated by conducting them off the Right-of-Way, but this only shifts the construction impacts to a location outside the pipeline Right-of-Way. Also, some impacts cannot be moved off the Right-of-Way, and must be conducted along the pipeline trench, and at the additional pipeline crossings, which then creates the risk of overstressing the operating pipelines and the threat of accidental strikes from backfilling equipment. To mitigate this risk in upland areas, Enbridge would need to use mat decking or bridging along the Right-of-Way. This matting would be used for travel lanes along the Project work site or to shuttle the spoil over and across operating pipelines to a designated storage area outside the construction footprint. Figure 5.4.2-3 shows a sample of the construction footprint on the Fond du Lac Band Reservation where mat decking and bridging would be used for travel and ingress/egress to the Project's construction work site.

For all the reasons discussed above, this relocation Option 1 alternative was rejected.

[1] The pipeline spacing may be slightly different in regions where there are heavily saturated soils.

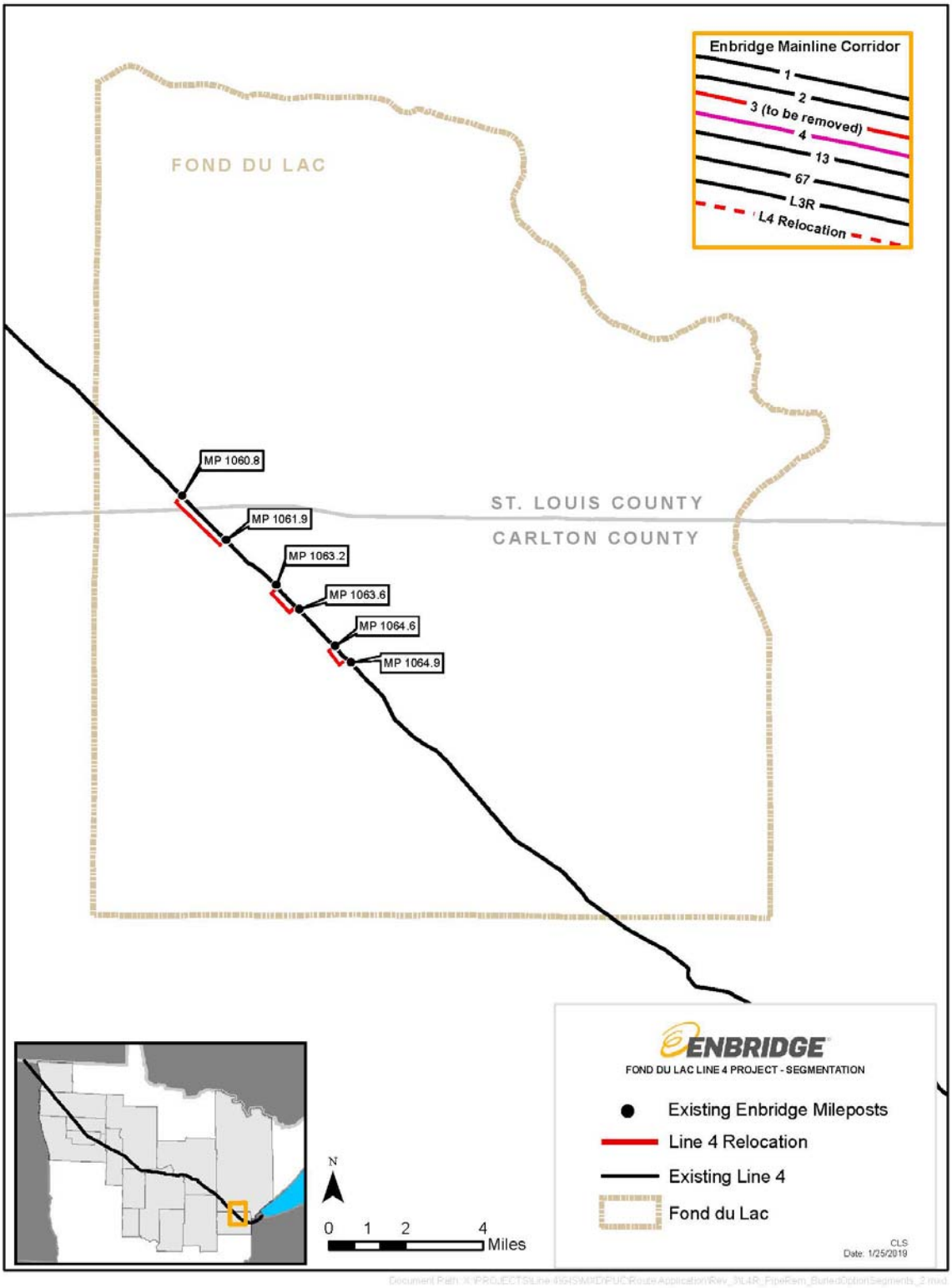

Figure 5.4.1-1 Option 1 Segment Relocation

5.4.2 Option 2 – Remediate Line 4 in the Same Trench by Lowering the Existing Pipe

Option 2 involves lowering the existing Line 4, 48-inch diameter pipe in the same pipeline trench (see Figure 5.4.2-1 for general location). Lowering the pipe would require the operating Line 4 pipe to be exposed, excavated under the pipe to the depth required, lowered to its final depth, backfilled, and restored. Option 2 would be located entirely within Line 4's existing pipeline Right-of-Way, and, if completed, would fall under the exclusion in Minnesota Rules Chapter 7852.0300 for replacement of an existing pipeline within an existing Right-of-Way. After applying the routing factors listed above and the criteria for pipeline route selection outlined in the Minnesota Rules Chapter 7852.0700, Enbridge concluded that the same trench lowering is not a feasible alternative and Option 2 has been rejected for the following reasons.

One of the primary reasons Option 2 was rejected is because the Line 4 pipeline was not originally designed to be lowered. The engineering factors and stress on the existing pipe would create additional and unnecessary risks with operating the pipeline. These design and operation concerns made Option 2 infeasible from Enbridge's viewpoint.

Another main reason that Option 2 was rejected is because Line 4 would need to be constructed in the same trench within the middle of the Enbridge Mainline Corridor (see Figure 5.4.2-2) making it very difficult for construction to occur within a restricted workspace.

Conducting heavy construction inside and over a multi-line pipeline corridor exposes the pipelines to risk that would otherwise not be present, thereby increasing the probability of damage. Also, there is an increased risk of damaging an operating pipeline through accidental contact with equipment, overloads on the surface above the pipelines, cave-ins, and adjacent pipe movement. In particular, Option 2 would operate heavy equipment over in-service high pressure pipelines and could overstress the operational pipelines. This also exposes the personnel performing the construction to dangers and the environment to potential impacts that are otherwise avoided in large part by constructing the relocation pipeline in the new Preferred Route location. Figure 5.4.2-3 below shows the typical construction footprint on the Fond du Lac Band Reservation, depicting the location of Line 4 within the congested six-pipeline Right-of-Way with limited spacing on either side of Line 4.

As described in Option 1, due to the limited workspace and the number of existing lines, heavy equipment and spoil would need to be placed directly on top of operating pipelines during construction. Some of these construction impacts could be mitigated by conducting them off the Right-of-Way, but this only shifts the impacts to a location outside the Enbridge Mainline Corridor. Also, some impacts cannot be moved off the Right-of-Way and must be conducted along the pipeline trench, which then creates the risk of overstressing the operating pipelines or posing the threat of accidental strikes from backfilling equipment. To mitigate this risk in upland areas, Enbridge would need to use mat decking or bridging along the entire Right-of-Way. This matting would be used to create travel lanes along the Project work site or to shuttle the spoil over and across operating pipelines to a designated storage area outside the construction footprint. The construction footprint on the Fond du Lac Band Reservation would

require mat decking and bridging for travel, and ingress/egress to the Project's construction work site.

Option 2 would increase environmental impacts since additional workspace will need to be obtained outside the Enbridge Mainline Corridor for equipment travel and spoil storage since the pipeline construction would be occurring over active pipelines. Specifically, Figure 5.4.2-3 shows the typical construction workspace where the construction work activities would be located on the south side of the Enbridge Mainline Right-of-Way on the Fond du Lac Band Reservation. The land requirements would be: **Uplands**: 273.5 feet in total, using 200 feet of existing Enbridge Right-of-Way and 73.5 feet of new temporary workspace area outside the Enbridge Mainline Corridor; and **Wetlands**: 248.5 feet in total, using 200 feet of existing Enbridge Right-of-Way and 48.5 feet of new temporary workspace area outside the Enbridge Mainline Corridor (a copy of this figure is enclosed as Appendix E). To put this in perspective, the Preferred Route (Option 5) is proposed to impact 140 feet in upland areas and 115 feet in wetlands areas, with 20 feet of new temporary workspace outside the Enbridge Mainline Corridor.

Further, same trench pipe lowering poses greater environmental impacts on wetlands and waterbodies as it would take an extended period of time to excavate the deeper, wider trench within waterbodies and wetland crossings. To safely excavate under the existing pipeline, excavation would need to occur in several steps. In order to not damage the existing pipe, non-intrusive excavation methods would be required for all excavation activities. Hydrovacing and associated cribbing to support the pipe would be required for the entire length of existing pipeline such that a stress-free condition would be realized for the duration. Although difficult to quantify duration of open excavation for Option 2, the unit of measure would certainly be measured in months. A trench open for protracted periods of time increases construction risks due to the additional work that would likely be necessary to maintain a clear trench. The EPP recommends limiting the duration of open trenches to the equivalent of 3 days of welding production. Lowering of Line 4 in its current location would result in the trench being open for protracted periods, significantly longer than 3 days, as Enbridge would lower the existing pipe.

With Option 2, the entire section would need to be lowered at once, where new construction would allow the wetland or waterbody crossings to be completed in shorter sections. These shorter sections would impact less area within the wetland and waterbodies as you can dig a much narrow trench, compared to a wider trench needed for lowering the line.

For all the reasons discussed above, the line lowering Option 2 alternative was rejected.

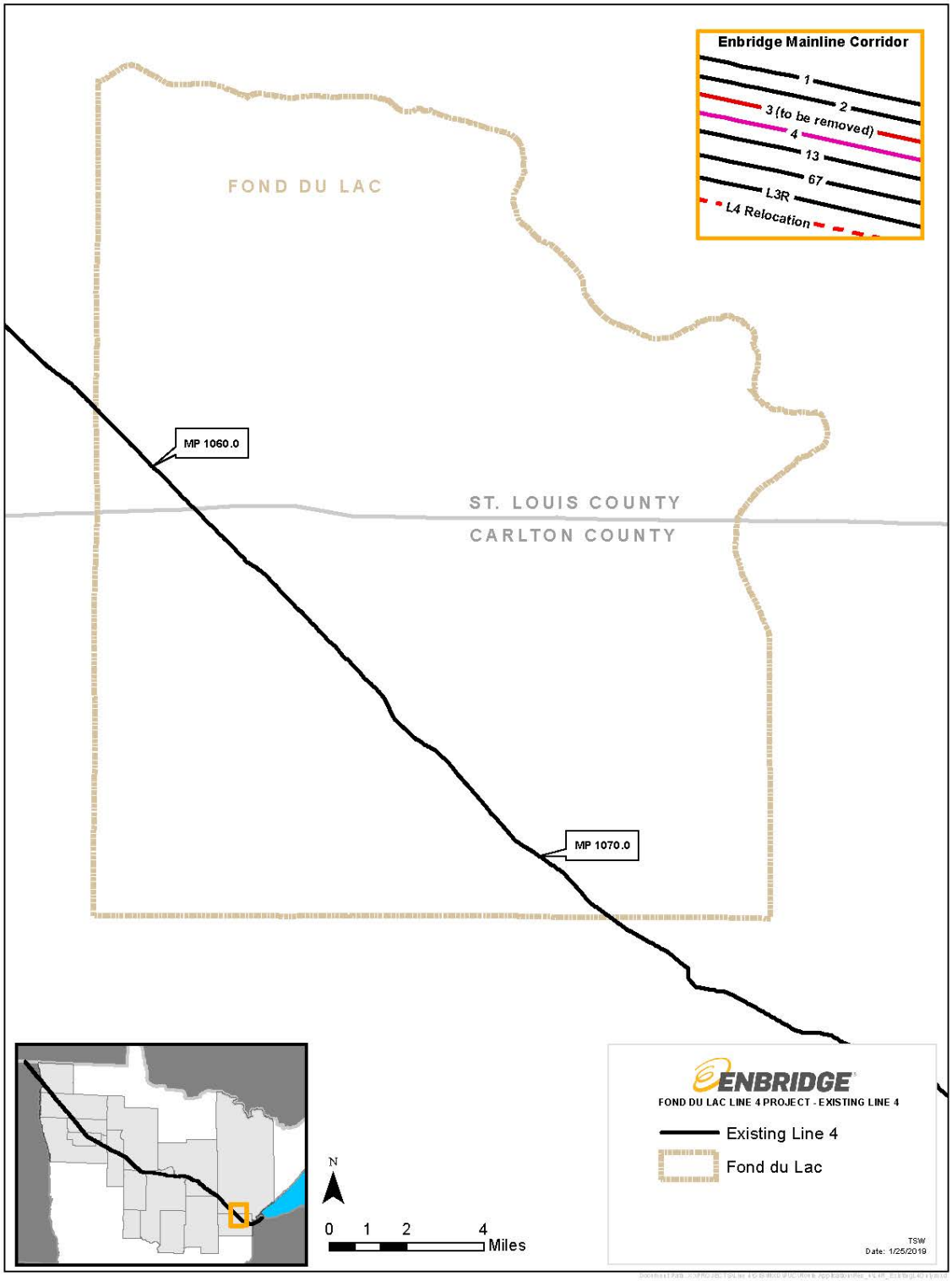

Figure 5.4.2-1 Option 2 Same Trench Line Lowering

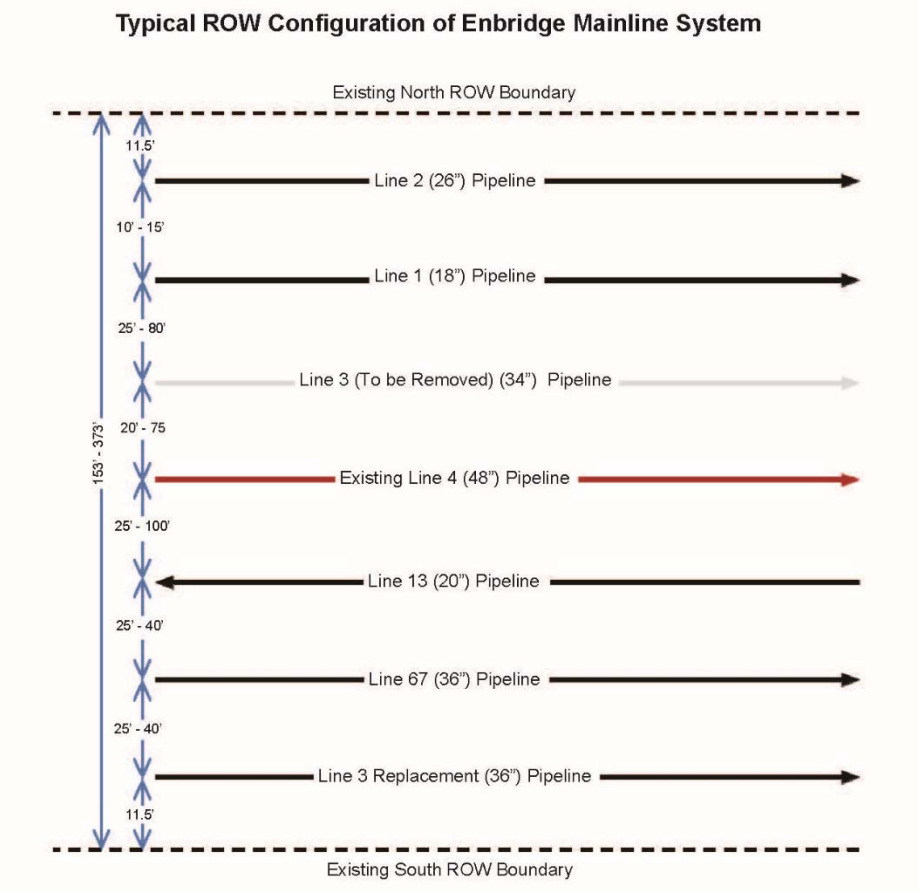

Figure 5.4.2-2 Typical ROW Configuration

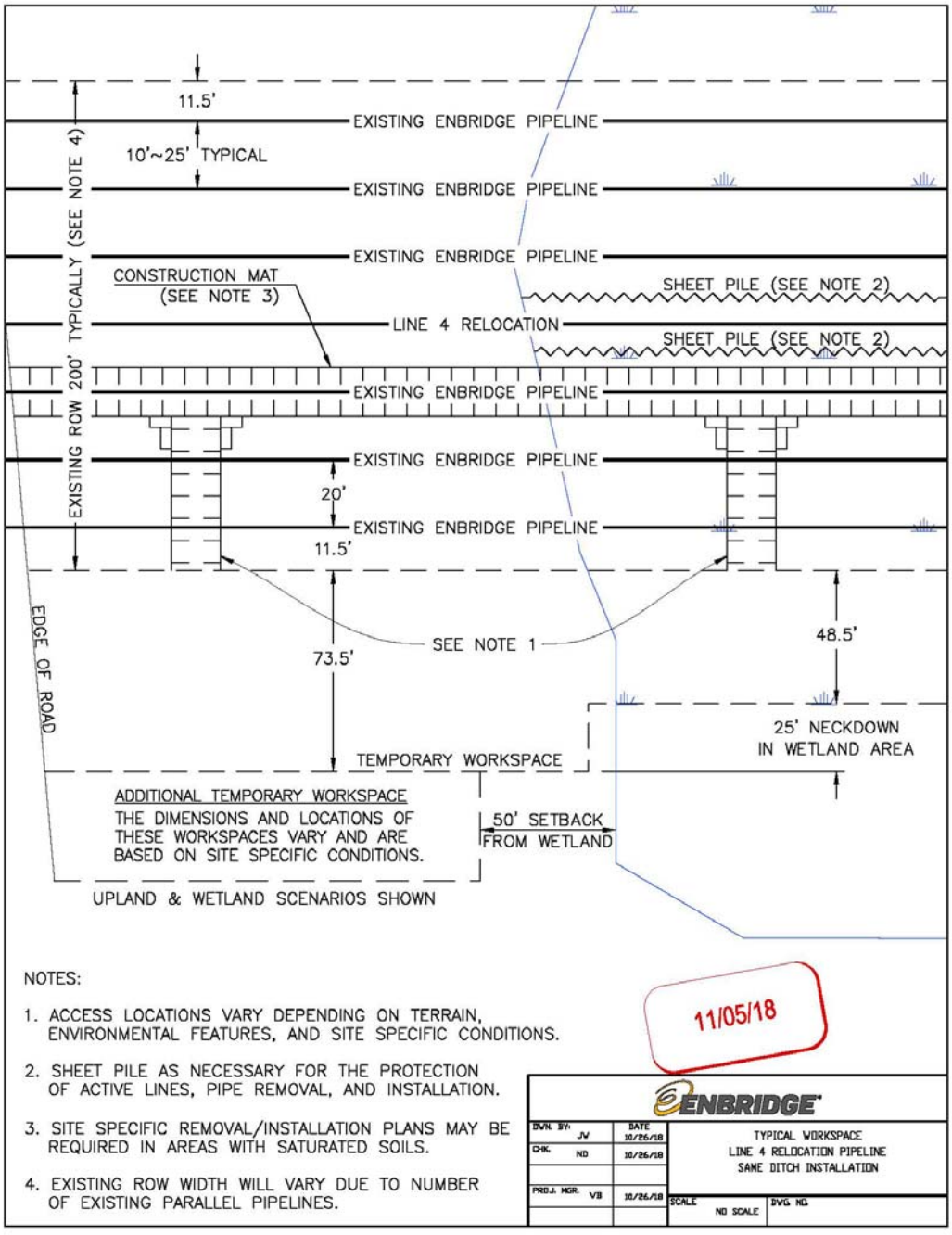

Figure 5.4.2-3 Option 2 Typical Construction Workspace in Fond du Lac Band Reservation – Same Trench Line Lowering Workspace in Uplands and Wetlands

5.4.3 Option 3 – Remediate the Exposed Sections of Line 4 by Utilizing the Mounding Technique

Option 3 would address the exposed areas of pipe by placing additional soil over the top of the existing 48-inch Line 4 (see Figure 5.4.2-1 above for general location). This option would reduce the amount of construction needed within the approximate 10 mile segment and utilize Line 4's existing pipeline Right-of-Way. However, this option does not address Fond du Lac's concerns with removing the existing above-grade pipe installed on the Reservation. After applying the routing factors listed above and the criteria for pipeline route selection outlined in the Minnesota Rules Chapter 7852.0700, Enbridge concluded that Option 3 is an inferior alternative and has been rejected for the following reasons:

One of the key drivers for the relocation of the Line 4 pipeline through the Fond du Lac Band Reservation is to mitigate the existing pipe, as it was installed on the surface of the ground using mounding techniques, with spoil placed on top to cover the pipeline. The mounding approach with Option 3 would only mitigate the exposure of the pipe and not remove the legacy pipe that was installed at the surface. Option 3 would exacerbate the restriction of natural water flow and damming that is currently occurring on the Reservation. Also, Option 3 could create an opportunity for both third party damage and long-term erosion of the mound that could leave the pipeline re-exposed. In addition, the Fond du Lac Band Community would continue to be impacted by the mounded pipeline as they actively practice traditional activities.

Option 3 would increase the risk to the environment and human population since the active pipeline would still be installed above-grade. In order to provide an acceptable amount of cover to the existing pipeline, approximately two feet of material would be installed over top of Line 4. This cover, on top of a pipe that was originally installed at the surface, would create a mound that is roughly six feet above the natural grade of the land. In order to create a smooth transition back to natural grade, the soil mounding would extend out roughly 25 feet on either side of the pipe. Construction of a large soil mound would permanently impact the wetlands it crosses by reducing the acreage of wetlands and impeding natural surface water flow.

To add material for mounding exposed Line 4 segments, a large footprint would be required to create an appropriate slope away from the top of the pipe, requiring that additional material be hauled in. Because this process would take place between and near multiple operating pipelines within a restricted workspace, there is increased risk of damaging an operating pipeline through accidental contact with equipment, overloads on the surface above the pipelines, cave-ins, and adjacent pipe movement due to the varying depths of cover, among other risks.

As described in Option 2, due to the limited workspace and the number of existing lines, heavy equipment and mounding material would need to be placed directly on top of operating pipelines during construction. Some impacts cannot be moved off the Right-of-Way and must be conducted along the pipeline centerline, which then creates the risk of overstressing the operating pipelines or posing the threat of accidental strikes from mounding equipment. To

mitigate this risk in upland areas, Enbridge would need to use mat decking or bridging along the Right-of-Way. This matting would be used for travel lanes along the Project work site or to shuttle the mounding material across operating pipelines to a designated storage area outside the construction footprint. Figure 5.4.2-3 shows a sample of the construction footprint on the Fond du Lac Band Reservation where mat decking and bridging would be used for travel and ingress/egress to the Project's construction work site.

For all the reasons discussed above, this relocation alternative was rejected.

5.4.4 Option 4 – Relocate Line 4 parallel to the existing Line 2 pipeline within Fond du Lac Band Reservation

Option 4 involves installing approximately 10 miles of new 36-inch pipeline, parallel and northeast of the Line 2 pipeline within the Fond du Lac Band Reservation, to relocate the existing Line 4 pipeline that will be removed following completion of the Line 3 Replacement Project. Where Enbridge's and Fond du Lac Band's Preferred Route would be constructed on the southwest side of the existing Enbridge Mainline Corridor, Option 4 would relocate Line 4 to the northeast side of the Enbridge Mainline Corridor.

Enbridge rejected Option 4 due to the significantly larger environmental impacts that would be realized with the installation of the Line 4 relocated segment on the Line 2 side of the Enbridge Mainline Corridor instead of the Line 3 Replacement side. There is an incremental increase in new Line 4 impacts from 40 feet for the Preferred Route to 93.5 feet for new temporary workspace within uplands; from 40 feet for the Preferred Route to 68.5 feet for new temporary workspace within wetlands; and from 60 feet for the Preferred Route to 83.5 feet for new temporary workspace within saturated wetlands (see Figures 5.4.4-1, 5.4.4-2, 5.4.4-3, 5.5.2, 5.5.3, and 5.5.4).

Option 4 would result in a total of approximately 116 acres of new Right-of-Way and temporary workspace impacts for Line 4. This is an additional approximately 52 acres of new impacts compared to the Preferred Route, which would impact a total of 64 acres of Line 4 temporary workspace and new Right-of-Way impacts.

For the reasons discussed above, Option 4 was rejected.

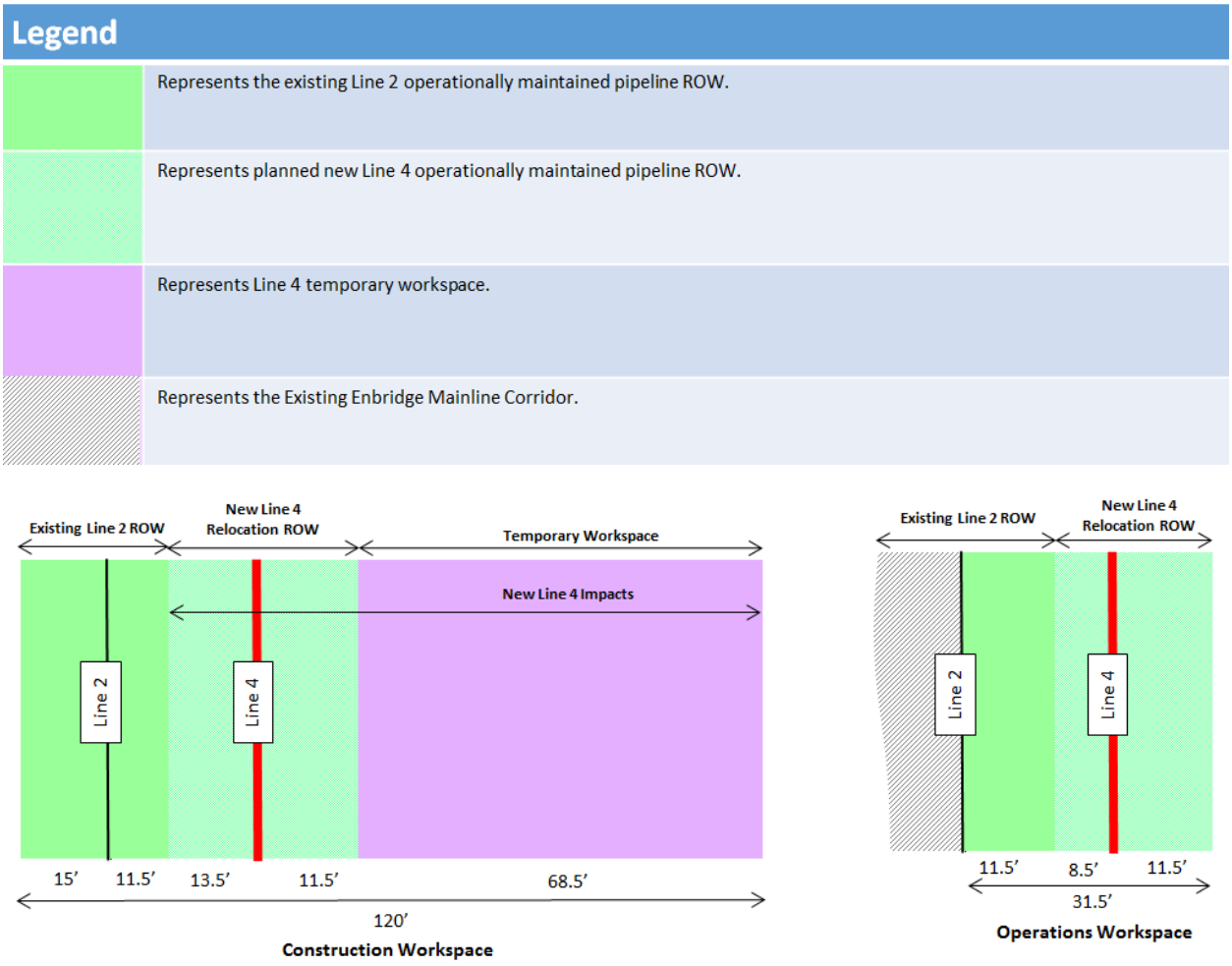

Figure 5.4.4-1 Option 4 Relocation of Line 4 adjacent to Line 2 – Workspace in Uplands

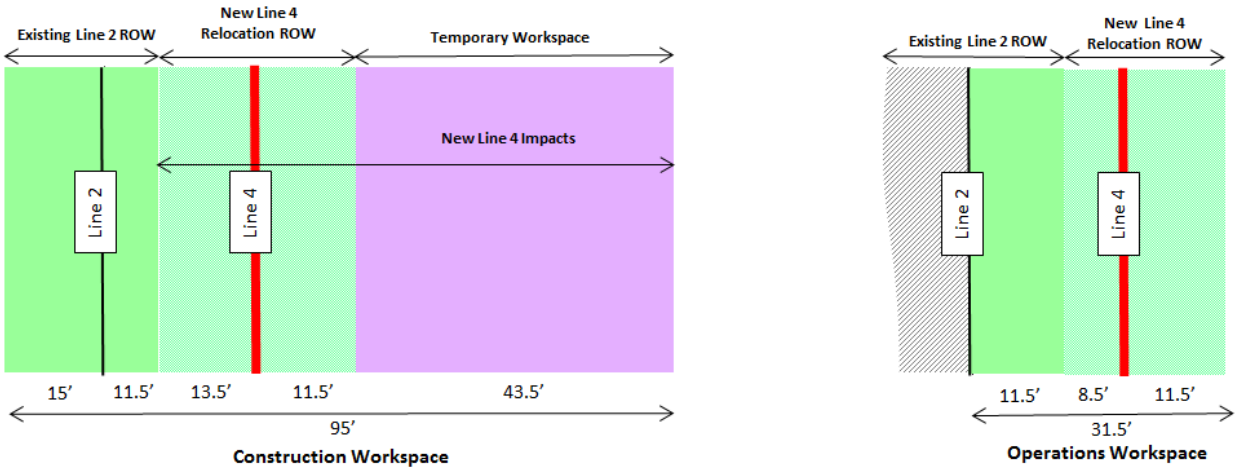

Figure 5.4.4-2 Option 4 Relocation of Line 4 adjacent to Line 2 – Workspace in Wetlands

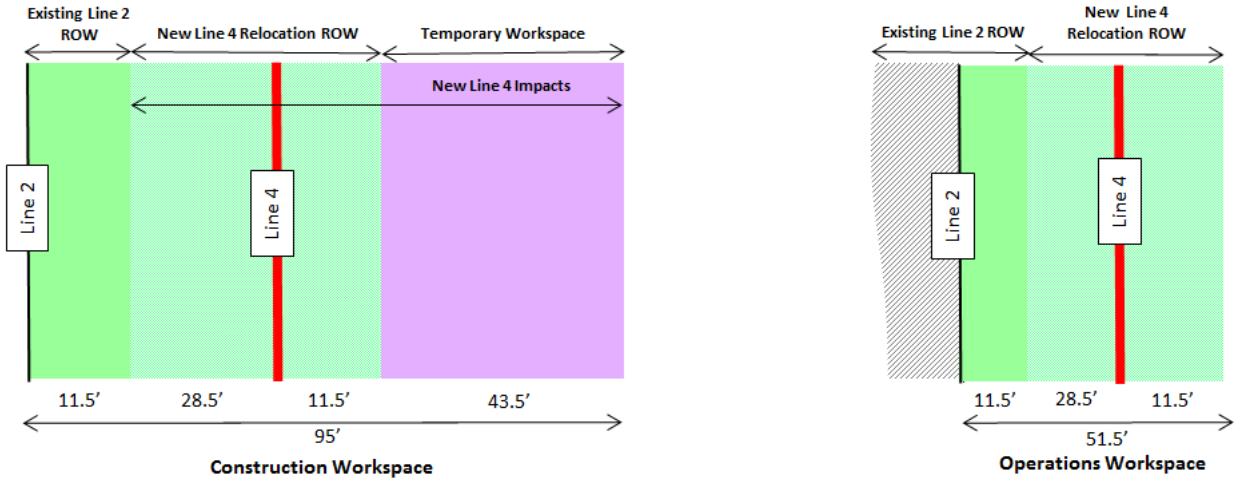

Figure 5.4.4-3 Option 4 Relocation of Line 4 adjacent to Line 2 – Workspace in Saturated Wetlands

5.4.5 Option 5 (Preferred Route) - Relocate Line 4 Parallel to the Line 3 Replacement Pipeline Within the Fond du Lac Band Reservation

The scope of this option involves installing approximately 10 miles of new 36-inch pipeline, parallel to the Line 3 Replacement pipeline within the Fond du Lac Band Reservation, to relocate a segment of the existing Line 4 pipeline that will be permanently deactivated following completion of the Project. After the 10-mile segment of pipe is relocated, the Line 4 pipe will be re-connected to the existing Enbridge Mainline System at the valve locations (MP 1060 & MP 1070) through mechanical excavation.

The Preferred Route enables partial sharing and/or paralleling of the existing Line 3 Replacement pipeline Right-of-Way along the Enbridge Mainline System (see Figure 5.4-5-1 below) as well as the co-construction with the Line 3 Replacement Project, minimizing the time of disturbance on the Fond du Lac Band Reservation.

The Preferred Route also shares and/or runs parallel to the Enbridge Mainline System on the Fond du Lac Band Reservation for its entire length. Fond du Lac Band has agreed to provide Enbridge new Right-of-Way for this relocation option. Additionally, the Preferred Route eliminates many of the constraints and technical difficulty identified in the options outlined above and also minimizes environmental impacts by sharing the authorized Line 3 Replacement Project workspace.

Constructing this Project to the south of the Line 3 Replacement pipeline would allow the majority of the construction activities to occur in a workspace that is free from multiple actively operating pipelines. While some workspace would need to be utilized for the storage of topsoil and other materials to the north of the proposed pipeline, much of the work would occur within a less restrictive workspace available to the south. A portion of the workspace would entail re-connecting the existing Line 4 pipeline at the valve locations (MP 1060 & 1070). This would result in approximately 150 feet of mechanical excavation work underneath three active pipelines.

Option 5 would avoid the need to first remove the existing pipeline since the relocation would occur outside the existing Line 4 Right-of-Way. This, in turn, would reduce the duration of construction through wetlands and other sensitive resources. Option 5 also minimizes the amount of time that trenches remain open and decreases construction risks. Specifically, trenches open for shorter durations minimize risk associated with changing weather conditions, such as frost and rain, which can severely weaken the trench wall, contributing to trench cave-in. Likewise, the less time the trench is open, the less groundwater that would need to be discharged out of the trench throughout the construction process.

Therefore, Enbridge, together with the Fond du Lac Band, have concluded that Option 5 best addresses the purpose and need for the Project while also minimizing human and environmental impacts. Option 5, identified as the Project's Preferred Route, is more fully described in Section 5.5. A detailed environmental analysis which complies with the Minnesota Rules Chapter 7852.0700 is provided in Section 6 of the Application.

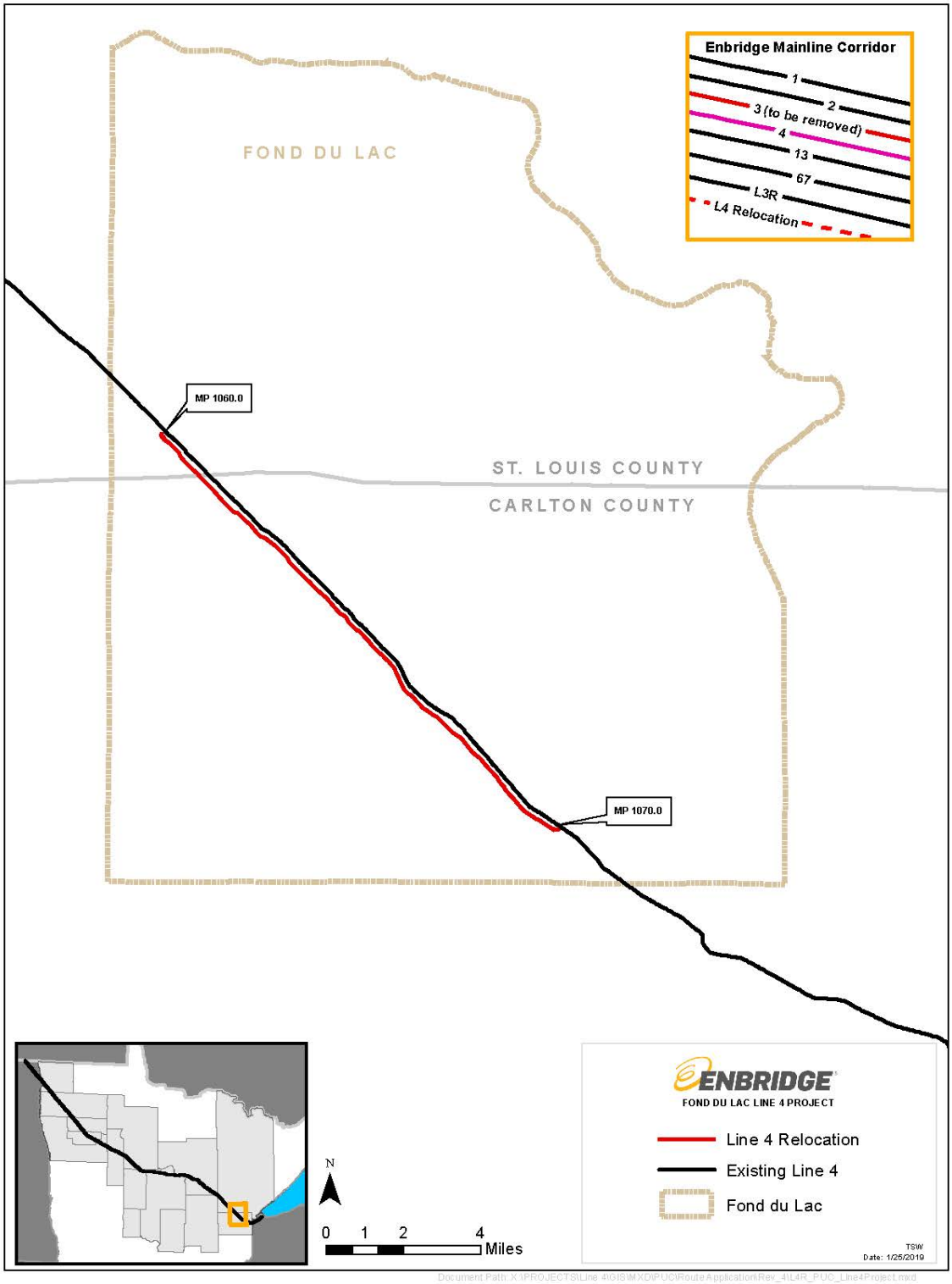

Figure 5.4.5-1 Option 5 Preferred Route

5.4.6 Summary of Project's Route Analysis

Enbridge and Fond du Lac Band agreed to relocate and bury the Project within the Reservation parallel to the existing Enbridge Mainline Corridor. Data collected for the routing analysis within the Fond du Lac Band Reservation shows that 100 percent of Option 5 would run parallel to the Enbridge Mainline System Right-of-Way (see details in Table 3.6.6-1).

In developing the Project's Preferred Route on the Fond du Lac Band Reservation, Enbridge studied a variety of engineering options and relocation alternatives before selecting its Preferred Route. Enbridge evaluated the geographic limitations of this Project, the criteria for pipeline route selection outlined in the Minnesota Rules Chapter 7852.0700, and compared routing factors including, but not limited to Constraints, Opportunities, Technical and economic feasibility, and potential environmental impacts for each of the alternative considered. Enbridge also utilized recent field survey data conducted within the reservation in developing the Preferred Route, to identify mitigation measures that will avoid or minimize potential impacts. Some of the advantages include:

- Meeting key goals of Fond du Lac Band;
- Meeting the Project's geographic requirements;
- Paralleling existing pipeline, utility, and transportation corridors;
- Feasibility from a construction and system perspective;
- Avoiding dense population centers and locating primarily in rural area; and
- Fewer disruptions to communities and recreational facilities.

It was further determined that Option 5 will have the least impact to existing residential and commercial areas because it would share and run parallel to the Enbridge Mainline System, which does not travel through heavily populated areas, as detailed in Section 6.5 of the Application. Also, Option 5 poses fewer construction challenges and technical difficulties than the same trench line lowering because the majority of the work activities would not occur within a congested pipeline corridor where pipeline spacing is limited as described above. For these reasons, Enbridge determined that the alternative which follows the Enbridge Mainline System and adjacent to the Line 3 Replacement pipeline is the best relocation option to meet the Project's objective while also minimizing human and environmental impacts. Thus, Enbridge and Fond du Lac Band selected Option 5 as the Project's Preferred Route.

Through this interactive process with stakeholders and the Fond du Lac Band, Enbridge has now identified the Project's Preferred Route as described in more detail in Section 5.5 of the Application.

5.5 Description of Preferred Route

The Project's Preferred Route begins near the Fond du Lac Band Reservation border in St. Louis County and extends approximately 10 miles near the end of the Fond du Lac Band Reservation border in Carlton County. Along this route, the Project will share and run parallel to the existing Enbridge Mainline System Right-of-Ways.

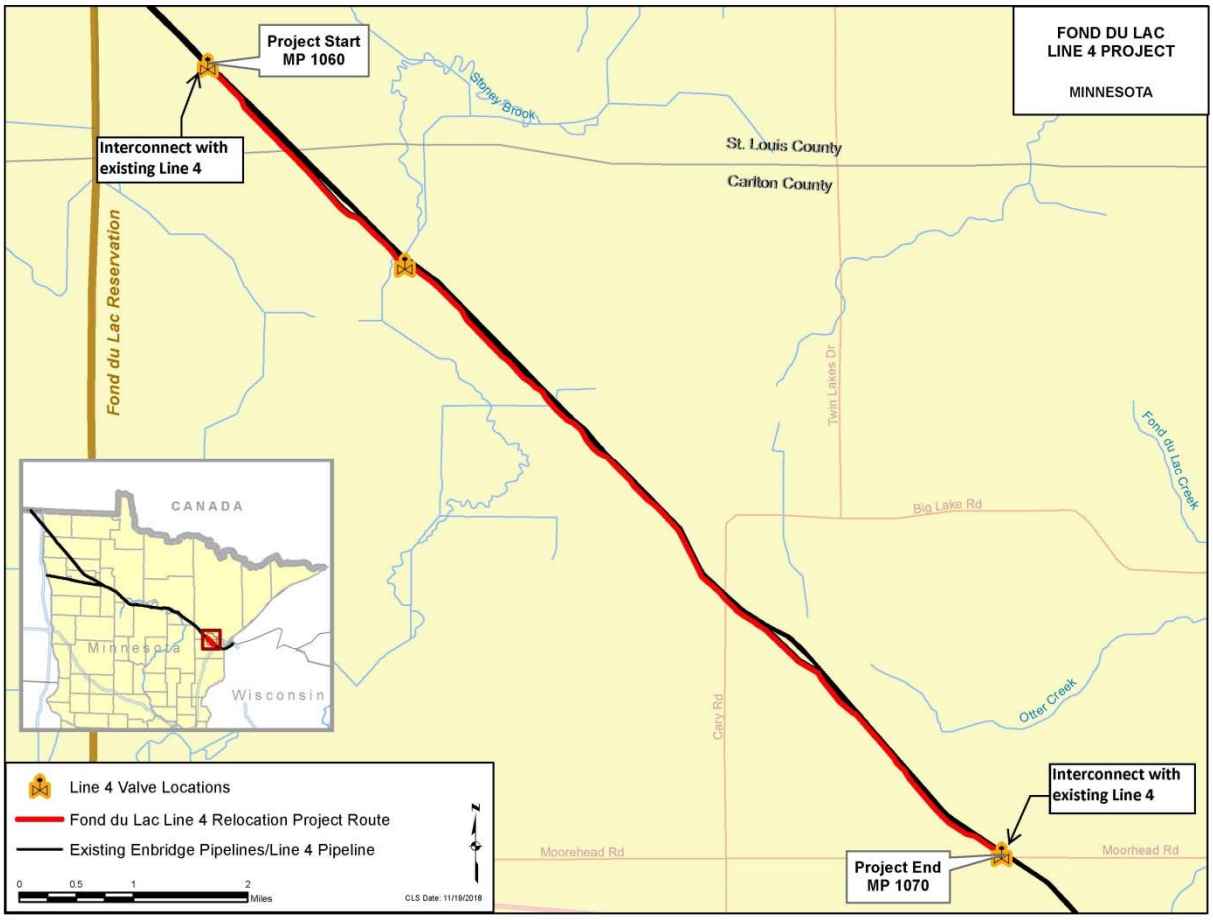

Figure 5.5-1 Option 5 Project Interconnections

In addition, Project maps containing USGS topographical maps and aerial photo maps have been developed to show the Preferred Route from near the Fond du Lac Band Reservation border in St. Louis County to near the end of the Fond du Lac Band Reservation border in Carlton County. The route maps are included in Appendix A to this application.

Figures 5.5.5 and 5.5.6 show the typical construction footprint on the Fond du Lac Band Reservation within the Preferred Route. As shown in Figures 5.5.2, 5.5.3, and 5.5.4, the land requirements for the Preferred Route would be: **Uplands**: 140 feet in total, using 20 feet of existing new Right-of-Way for Line 4, 51.5 feet of existing new Right-of-Way for Line 3 Replacement pipeline, 48.5 feet of shared temporary workspace for the Line 3 Replacement Project, and 20 feet of new Line 4 temporary workspace area; **Wetlands**: 115 feet in total, using 20 feet of existing new Right-of-Way for Line 4, 51.5 feet of existing new Right-of-Way for Line 3 Replacement pipeline, 23.5 feet of shared temporary workspace for the Line 3 Replacement Project, and 20 feet of new Line 4 temporary workspace area; **Saturated Wetlands**: 135 feet in total, using 40 feet of existing new Right-of-Way for Line 4, 51.5 feet of existing new Right-of-Way for Line 3 Replacement pipeline, 23.5 feet of shared temporary workspace for the Line 3 Replacement Project, and 20 feet of new Line 4 temporary workspace area.

Overall, the amount of new Right-of-Way to be acquired is anticipated to be limited to 37 acres. In total, Project construction will affect approximately 168 acres of land. Of that total, 64 acres would be just the Line 4 temporary workspace and new Right-of-Way impacts. The rest of the total will be shared temporary workspace and new Right-of-Way workspace with the Line 3 Replacement Project (104 acres).

Legend	
	Represents planned Line 3 Replacement operationally maintained pipeline ROW that is planned to be disturbed by the Line 3 Replacement Project and planned to be used as temporary workspace for the Fond du Lac Line 4 Project.
	Represents planned new Line 4 operationally maintained pipeline ROW that is planned to be disturbed by the Line 3 Replacement Project.
	Represents Line 4 temporary workspace planned to be cleared for the Line 3 Replacement Project.
	Represents planned new area of disturbance that is planned to be used as temporary workspace during the construction for the Fond du Lac Line 4 Project.
	Represents the Existing Enbridge Mainline Corridor.

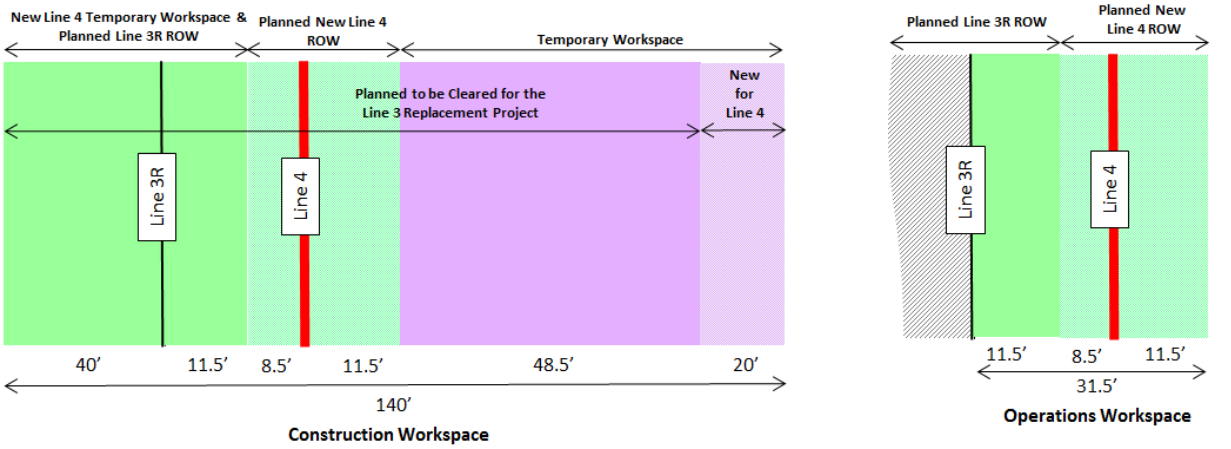

Figure 5.5-2 Option 5 Relocation of Line 4 Adjacent to Line 3 Replacement – Workspace in Uplands

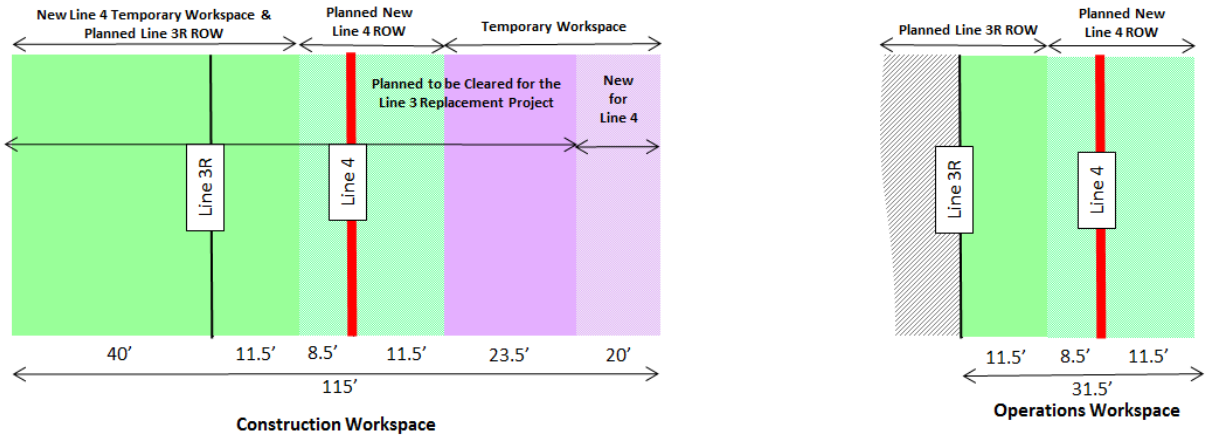

Figure 5.5-3 Option 5 Relocation of Line 4 Adjacent to Line 3 Replacement – Workspace in Wetlands

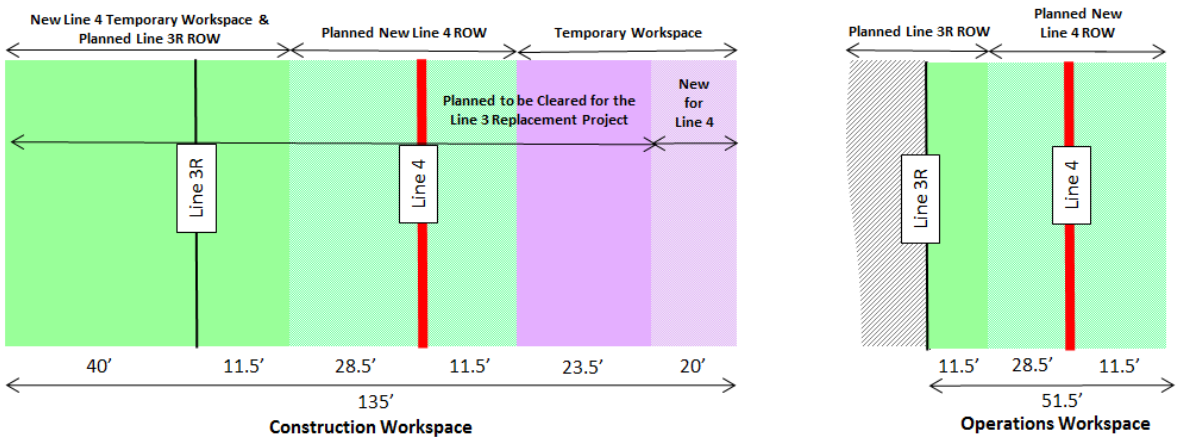

Figure 5.5-4 Option 5 Relocation of Line 4 Adjacent to Line 3 Replacement – Workspace in Saturated Wetlands

The Project's Preferred Route will generally follow the existing Enbridge Mainline Corridor and run parallel to the Line 3 Replacement Project's existing pipeline Right-of-Way. The Project is proposed be installed 20 to 40 feet away from the Line 3 Replacement pipeline as shown on the Project's typical Right-of-Way configuration on Figures 5.5-5 and 5.5-6.

The Line 4 relocated pipeline will generally be installed next to the Line 3 Replacement pipeline at a standard offset of 20 feet in both uplands and wetlands. However, there are saturated wetland areas that, because of poor soil-bearing strength and potential trench wall failure during construction, may result in a wider trench and additional spoil storage needs. In addition, waterbody crossings may result in a wider trench to accommodate deeper pipe depth requirements. Therefore, a pipe separation of 40 feet will be necessary in these areas to safely and efficiently construct the pipelines (refer to Figure 5.5.6).

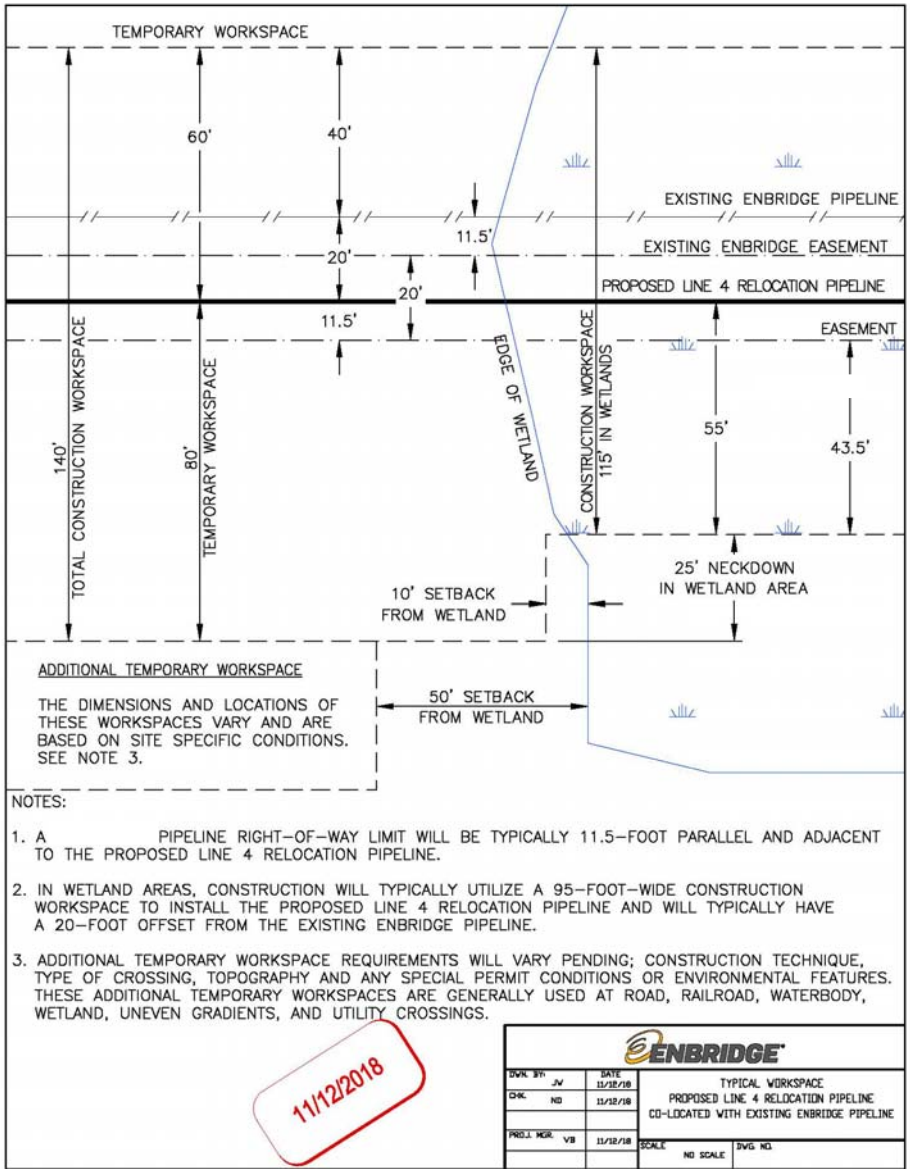

Figure 5.5-5 Option 5 Typical Construction Workspace Fond du Lac Band Reservation Preferred Route

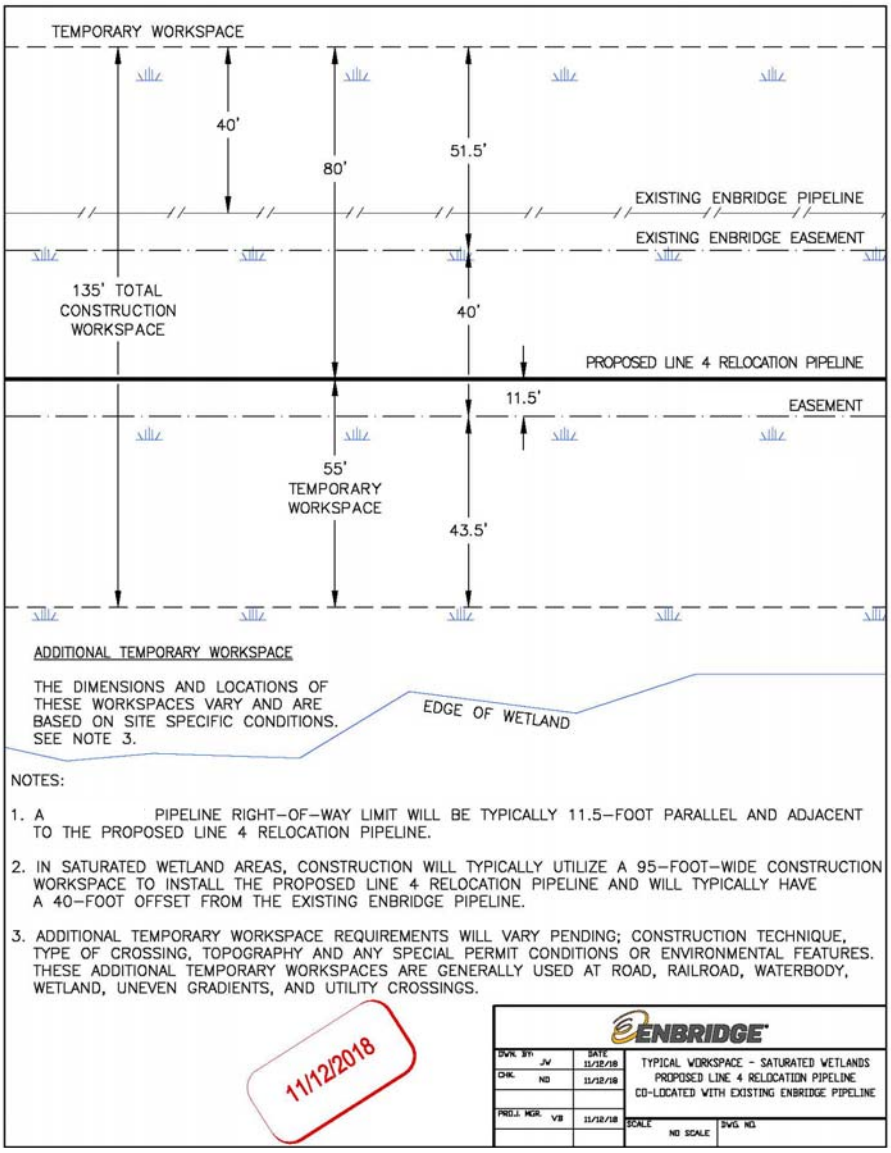

Figure 5.5-6 Option 5 Typical Construction Workspace Fond du Lac Band Reservation Preferred Route in Saturated Wetlands

The Project's Preferred Route will be co-located with and run parallel to the planned pipeline Right-of-Way of the Line 3 Replacement Project. For that reason, Enbridge has taken into consideration and used in its route selection processes all the survey work and constructability reviews performed by the Line 3 Replacement Project Execution Team as more fully described in Section 6 of this Application. Moreover, Enbridge has worked diligently with Fond du Lac Band to evaluate and adjust its Preferred Route to accommodate comments received from Fond du Lac Band. Consequently, the Project's Preferred Route has been well studied and thoroughly analyzed to ultimately provide a reasonable and financially viable route that avoids and/or minimizes impacts to the environment and human settlements.

Enbridge therefore respectfully submits that the Preferred Route is in the public interest as it balances all criteria required to be considered by the MPUC, environmental regulations, socioeconomic and human factors, as well as strict engineering standards.

6.0 Environmental Impact of Preferred Route

6.1 Introduction

This Project is being proposed in response to a request from Fond du Lac Band that Enbridge remediate an existing above-grade segment of Line 4. Fond du Lac Band has raised concerns that the above-grade Fond du Lac Band Line 4 segment creates a barrier to the natural water flow across the Reservation and, in some areas, impedes land access for the Band members to gather medicinal plants and other culturally important resources. Once completed, the Project will have human and environmental benefits following the planned future removal of the existing segment of Line 4, as it will provide enhanced access for Band members using the area and allow future environmental remediation of the natural environment in this portion of the Reservation.

This section of the Application also addresses the potential human and environmental impacts associated with construction and operations of the Preferred Route. Enbridge contracted with Environmental Resources Management, Inc. (ERM), to gather, examine, and analyze data on the following resources (in order of discussion below): the human settlement, transportation, noise, land use, public and designated lands, geology, soils, vegetation, wildlife, fisheries, threatened, endangered and sensitive species, groundwater resources, wetlands, waterbodies, cultural resources, and air quality. Each resource section within Section 6.0 contains a description of the existing environment, a discussion of construction impacts and mitigation, and a discussion of normal operating impacts and mitigation.

The proposed Fond du Lac Band Line 4 Project will not have significant impacts to humans or the environment. The Project is co-located with the existing Enbridge Mainline System, minimizing land use, environmental and human impacts. The Project passes through an area of sparse population density where the majority of the land cover is either wetland/open waters (approximately 49 percent) or forest (approximately 35 percent). Further, the Project will be co-constructed with the Line 3 Replacement Project. This co-construction will utilize workspace that is planned to be disturbed by the authorized Line 3 Replacement Project and will minimize the duration of disturbance on the Fond du Lac Band Reservation. In total the Project construction will affect approximately 168 acres of land with the relocation of an approximate 10-mile segment. Of that total, 64 acres are related to the Line 4 temporary workspace and new Right-of-Way. The remaining impacts (104 acres) will be temporary workspace and new Right-of-Way workspace shared with the Line 3 Replacement Project. Enbridge will work with the Fond du Lac Band to establish restoration goals for the areas impacted by the Project including streambank restoration, reestablishing natural contours, reestablishing natural hydrology, and revegetating disturbed areas with appropriate species.

6.1.1 Agency Consultations and Commitments

In addition to gathering, examining, and analyzing environmental data, Enbridge has been or will be communicating with federal, Fond du Lac Band Tribal, state, and local regulatory agencies regarding potential environmental impacts resulting from construction and operations of the Project on the Preferred Route. Table 6.1.1-1 outlines the agencies that have been or will be consulted.

Table 6.1.1-1
Federal, State, and Local Regulatory Agency Consultations
Fond du Lac Band Line 4 Project

Agency
FEDERAL
United States Army Corp of Engineers (USACE) - St. Paul District
United States Fish and Wildlife Service (USFWS) – Twin Cities Ecological Services Field Office
Bureau of Indian Affairs
TRIBAL
Fond du Lac Band Resource Management Division
Tribal Historic Preservation Office (THPO)
STATE
Minnesota Department of Commerce
Minnesota Board of Water and Soil Resources (BWSR) – Duluth
Minnesota Department of Natural Resources (MNDNR) - Division of Water and Ecological Resources
MNDNR - Division of Lands and Minerals
MNDNR - Natural Heritage Information System
LOCAL
Wetland Conservation Act (WCA) Local Government Unit Exemption – St. Louis County
WCA Local Government Unit Exemption - Carlton County

Enbridge will continue to coordinate with agencies on items that arise from initial Project consultations.

6.1.2 Field Surveys

The proposed Fond du Lac Band Line 4 Project construction workspace will be located within the larger survey corridor developed as part of a comprehensive resource survey update along and adjacent to Enbridge's Mainline System within the Fond du Lac Band Reservation. Enbridge began conducting field surveys for several of the resources discussed in Section 6.0 in early 2018. As of January 2019, 71 of 78 tracts had been surveyed for wetland and waterbody features (approximately 91 percent). Tribal cultural surveys are currently in progress, as further discussed in Section 6.16, Cultural Resources. For the tracts where survey

access has not yet been granted, published databases were used to estimate resource impacts.

Enbridge coordinated with Fond du Lac approved crews to conduct a Tribal Cultural Resource Survey of the Project Route within the Fond du Lac Band Reservation in 2018 to identify historic and traditional cultural properties that could be affected during Project construction. In addition, as part of required state and federal historic properties review, Enbridge sponsored Tribal Cultural Resource Surveys and oral history interviews with Tribal Elders and Tribal Community members to gather information on potential tribal resources in the Project area. Enbridge will continue to assist in this effort and will coordinate with the Fond du Lac Band to support the Section 106 consultation required under the federal National Historic Preservation Act.

6.1.3 Impact Calculations

Because the Project is co-located within the Enbridge Mainline System and existing Right-of-Way, the majority of the Project construction workspace will occur in areas planned to be disturbed by the authorized Line 3 Replacement Project. To present different areas of impact of the Project, Enbridge presents the temporary and permanent impacts in the following categories:

- Disturbance in areas authorized for construction of the Line 3 Replacement Project but not yet disturbed within the current and planned Enbridge Mainline Corridor. These disturbances are outlined in Table 6.1.3-1 and in Figures 6.1.3-3, 6.1.3-4, and 6.1.3-5 as "New Line 4 Temporary Workspace and Planned Line 3R ROW", " Planned Line 4 ROW", and "Temporary Workspace Planned to be Cleared for the Line 3 Replacement Project."
- New disturbance exclusive to Line 4 construction in undisturbed areas outside the Enbridge Mainline Corridor (i.e., areas not disturbed by the planned Line 3 Replacement Project). This disturbance is outlined in Table 6.1.3-1 and Figures 6.1.3-3, 6.1.3-4, and 6.1.3-5 as "Temporary Workspace New for Line 4."

For the purpose of assessing environmental impacts, Enbridge differentiated the impact calculations into three different types as presented in Table 6.1.3-1: upland construction, wetland construction, and saturated wetland construction. Figure 6.1.3-1 outlines the current Enbridge Mainline Corridor within the Fond du Lac Band Reservation and Figure 6.1.3-2 outlines the proposed Enbridge Mainline Corridor with the relocated Line 4 and Line 3 pipelines within the Fond du Lac Band Reservation. Figures 6.1.3-3 through 6.1.3-5 illustrate how temporary (construction) and permanent (operations) impacts were calculated in both upland and wetland areas. Further details about resource-specific impacts are provided in Sections 6.5 (Land Use) and 6.14 (Wetlands). Temporary impacts may also result during Project operations from maintenance activities; however, the area of these impacts is not included in the calculations.

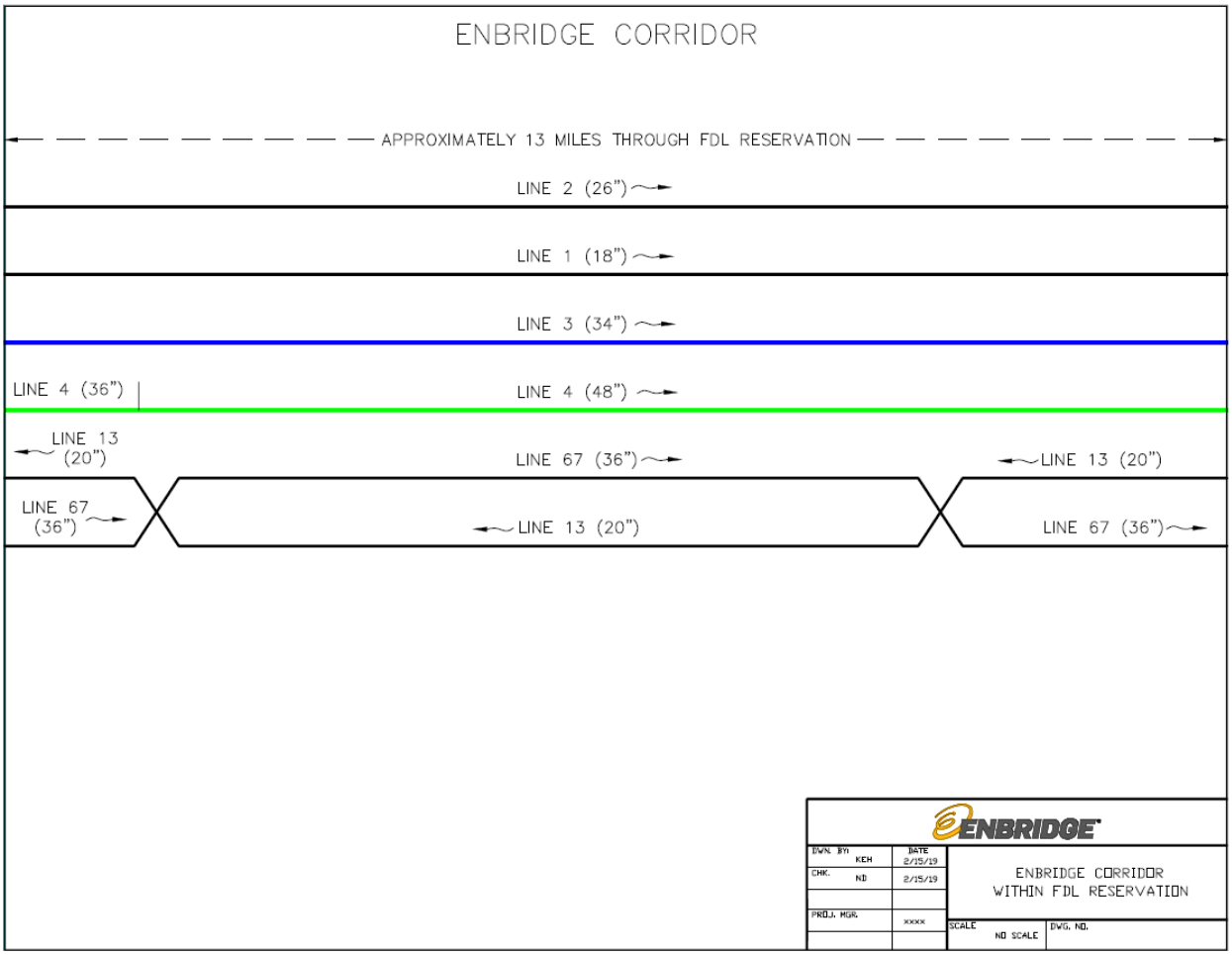

Figure 6.1.3-1 Enbridge Mainline Corridor within the Fond du Lac Band Reservation

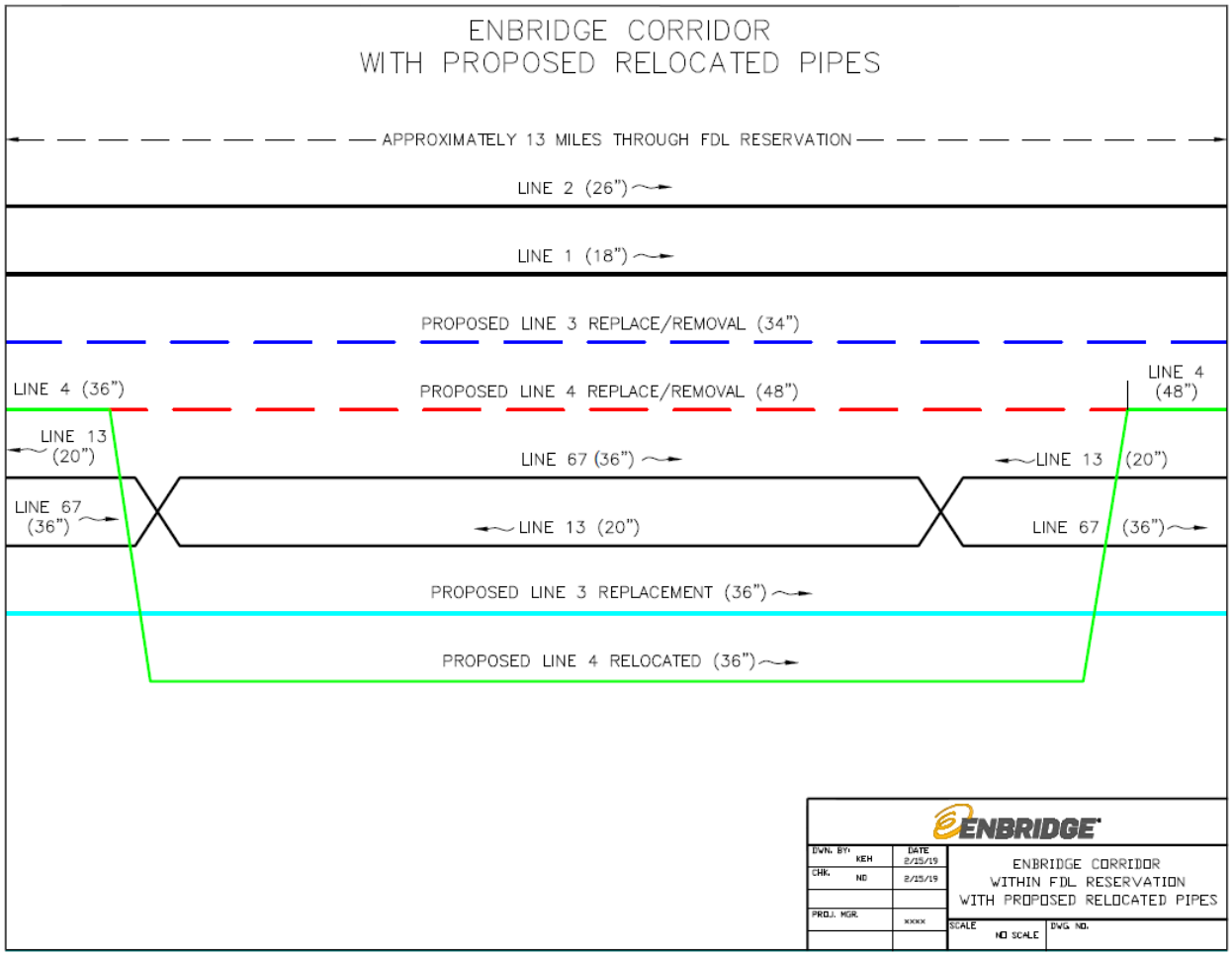

Figure 6.1.3-2 Proposed Enbridge Mainline Corridor within the Fond du Lac Band Reservation

Legend	
	Represents planned Line 3 Replacement operationally maintained pipeline ROW that is planned to be disturbed by the Line 3 Replacement Project and planned to be used as temporary workspace for the Fond du Lac Line 4 Project.
	Represents planned new Line 4 operationally maintained pipeline ROW that is planned to be disturbed by the Line 3 Replacement Project.
	Represents Line 4 temporary workspace planned to be cleared for the Line 3 Replacement Project.
	Represents planned new area of disturbance that is planned to be used as temporary workspace during the construction for the Fond du Lac Line 4 Project.
	Represents the Existing Enbridge Mainline Corridor.

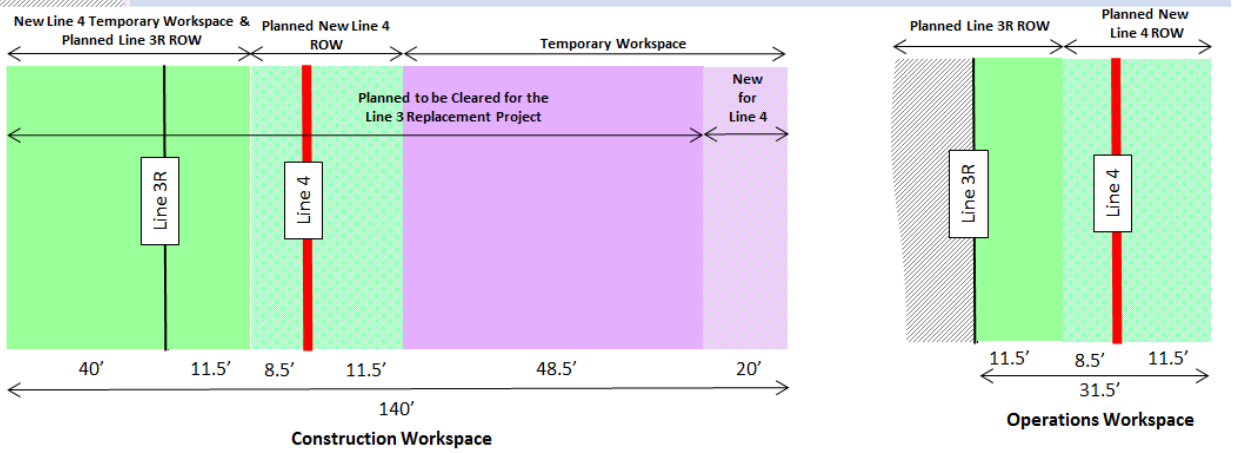

Figure 6.1.3-3 Workspace in Uplands

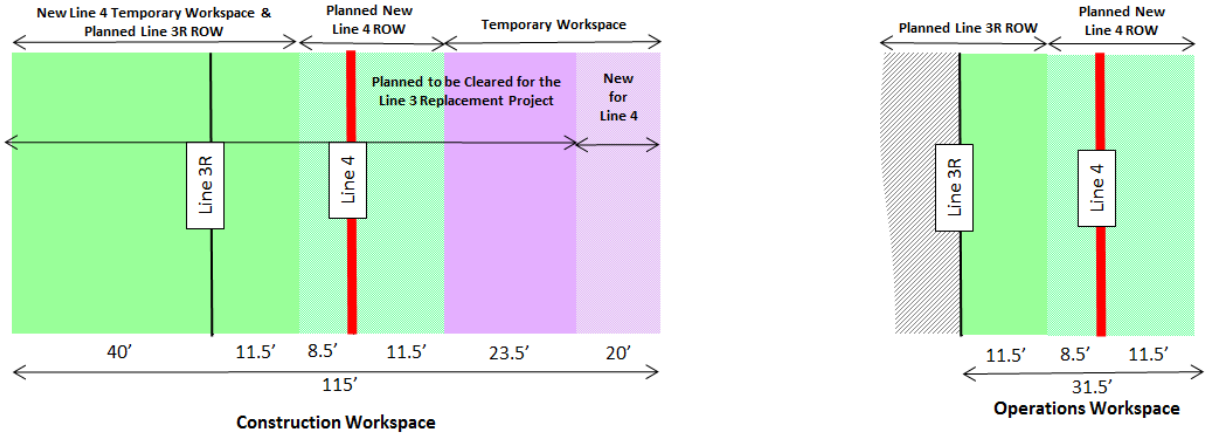

Figure 6.1.3-4 Workspace in Wetlands

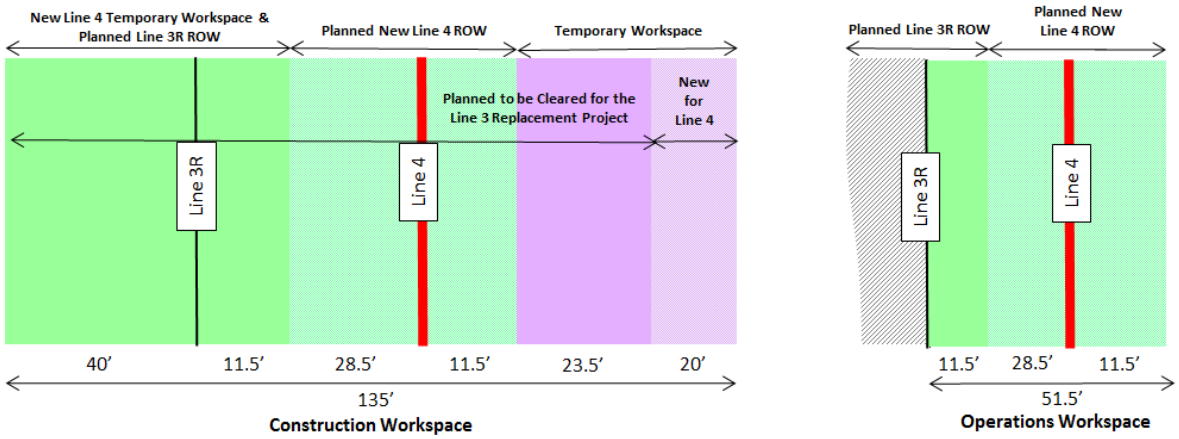

Figure 6.1.3-5 Workspace in Saturated Wetlands

Table 6.1.3-1
Summary of Impact Calculations

Calculation Type	Description	Figure	Total Construction Workspace [a]	Planned Disturbance [b]			New Disturbance
				New Line 4 Temporary Workspace & Planned Line 3R ROW (Construction)	Planned New Line 4 ROW (Construction /Operational)	Temporary Workspace Planned to be Cleared by the Line 3R Project (Construction) [c]	New Temporary Workspace For Line 4 (Construction)[c]
Upland Construction	Upland areas within the pipeline corridor	6.1.3-3	140 feet	51.5 feet	20 feet	48.5 feet	20 feet
Wetland Construction	Non-saturated wetland areas within the pipeline corridor	6.1.3-4	115 feet	51.5 feet	20 feet	23.5 feet	20 feet
Saturated Wetland Construction	Saturated wetland areas within the pipeline corridor	6.1.3-5	135 feet	51.5 feet	20 feet	23.5 feet	40 feet

[a] The construction workspace includes temporary workspaces and additional temporary workspaces (ATWS) as described in Section 3.6.
[b] Disturbance on the Enbridge Right-of-Way planned to occur for the Line 3 Replacement Project.
[c] These are typical widths and may vary along the Preferred Route.

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6.1.4 Operational Impacts

As noted in Section 6.1, this Application discusses impacts from normal operations and measures that minimize those impacts.

While potential impacts of a theoretical oil release during operations are a risk of any oil pipeline, the Project lessens the risk through the Fond du Lac BandReservation as compared to existing Line 4. The risk will be lower because the Project buries the currently above-grade pipe, thereby reducing the risk of third party damage. In accordance with federal requirements (49 C.F.R. § 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. The majority of the Project, pursuant to the federal regulations, will be buried with a depth of cover of 30 inches.

In addition, the Project will utilize modern pipeline design, including design techniques, technical specifications for pipeline materials; operation and emergency protocols for pipelines; ongoing monitoring and inspection of pipelines; and preventative maintenance, all which reduce the risk of a release because the new pipelines would be built with better materials and technology. Enbridge will also meet all federal regulations for pipeline design, monitoring, and inspection safeguards to prevent spills from occurring.

For example, Enbridge has an internal safety requirement that utilizes a pre-startup safety review prior to commencing any linefill or actively starting up the pipeline. A field safety assessment on the pipeline is conducted to determine if the pipeline is ready to be placed into service. The pre-startup safety review provides in-the-field assessments of the safety systems, safety equipment, and the asset's integrity. The Project and Operations teams conduct a series of these field assessments or readiness reviews in the weeks leading up to the scheduled pipeline linefill. The safety reviews also consist of assessing the piping and equipment flanges, drains, and vents, to make sure they are tight in order to minimize the likelihood of an unplanned release. Pipeline startup is signed-off and approved by the Enbridge Operation team before placing the pipeline into service.

Further, in the event of a spill, Enbridge would coordinate with the Fond du Lac Band and follow procedures outlined in Section 10 of the EPP, the Enbridge Field Emergency Response Plan, and any Fond du Lac specific emergency plans and procedures, to quickly respond to and address a spill should one occur. In addition, there are numerous federal and state laws requiring cleanup to be completed to the satisfaction of the applicable agency, compensation for any affected parties and the Natural Resource Damage Assessment rules requiring mitigation for affected environmental resources, which were impacted. Therefore, the following operational impacts and mitigation descriptions only account for normal operating impacts due to pipeline maintenance, Right-of-Way clearing, and mowing activities.

6.1.5 Associated Facilities Impacts

As described in Section 3.0, Enbridge is proposing the following above-ground facility installations or modifications:

- Remove the existing 48-inch mainline valve at MP 1060 as it is no longer needed due the existing 36-inch mainline valve located immediately upstream, at the transition from 36-inch to 48-inch pipe.
- Install a new mainline valve at MP 1062, which will be co-located with a mainline valve for the Line 3 Replacement Project; and
- The existing Line 4 mainline valve at MP 1070 will be removed and replaced with a new 36-inch mainline valve. The location of the replaced mainline valve will be adjacent to, and co-located with, the planned Line 3 Replacement Project mainline valve site.

The installation and modifications at these mainline valve sites will have minor temporary and permanent impacts for this Project as described in Section 6.14 (Wetlands).

6.2 Human Settlement

6.2.1 Existing Environment

Human Population and Socioeconomics Conditions

The Preferred Route crosses through the Fond du Lac Band Reservation in Carlton and St. Louis Counties. The population estimates from the 2017 U.S. Census Bureau in Carlton County is 35,498 people and in St. Louis County 200,000 people (U.S. Census Bureau, 2017). Specifically, the American Indian and Alaska Native population from the 2017 population estimates U.S. Census Bureau in Carlton County is 2,122 and 4,711 in St. Louis County (U.S. Census Bureau, 2017). The Fond du Lac Band is one of six Chippewa Indian Bands that make up the Minnesota Chippewa Tribe and was established in the La Pointe Treaty of September 24, 1854. The Fond du Lac Band Reservation is 100,000 acres and includes over 4,200 members (Fond du Lac Band, 2013).

In general, the Preferred Route avoids population centers. Three municipal boundaries will be crossed by the Preferred Route (Table 6.2.1-1).

Table 6.2.1-1
Municipalities within One Mile of the Fond du Lac Band Line 4 Project

County	Municipality	Approximate Milepost	Population (2010)[a]
St. Louis	Arrowhead Township (city)	1060	223
Carlton	Perch Lake Township (city)	1069	892
Carlton	Progress Township (city)[b]	1061	Not Available

[a] U.S. Census Bureau, 2010
[b] Progress Township is an unorganized township within Carlton County and Census Bureau data is not available.

Economies along the Preferred Route include forestry, recreation, and tourism. No commercial or industrial operations are present along the Preferred Route. As discussed under Section 6.5, there are approximately 60 acres of forested land and no known agricultural land within the Preferred Route. The majority of this land will be disturbed with the MPUC-approved Line 3 Replacement Project. There are two identified census tracts of environmental justice concern along the Preferred Route.[2]

Mining resources located in the Project area and potential impacts to those resources are described in Section 6.7. With respect to recreational economies, the Project will not cross any federal parks or state parks; it will cross approximately 2.3 miles of state forest. As discussed in Section 6.6, the Project will not cross any recreational trails or any canoe or boating routes.

[2] Line 3 Replacement Project Final Environmental Impact Statement, Chapter 11, Section 11.1 (Minnesota Department of Commerce, 2018).

6.2.2 Construction Impacts and Mitigation

Human Populations and Socioeconomics

There are 176 residences within ½ of a mile of the Project who may be impacted directly through construction activities or indirectly through construction noise and traffic, which includes the associated access roads. Enbridge has been working with private landowners impacted by the Project to address their concerns through notification in writing, direct phone-calls, and in person meetings.

Enbridge anticipates that construction of the Project will provide temporary beneficial impacts to local economies during construction. Enbridge, through construction contractors and subcontractors, will hire local workers where the local workforce possesses the required skills. Enbridge is also committed to doing business with Indigenous contractors and suppliers. As a result, Enbridge plans to provide work commitments to the Fond du Lac Band for this Project. Construction of the Project will also benefit local economies through expenditures of construction worker wages, purchases of materials, and other services. The total project costs are expected to be at least $100M.

Enbridge has not identified any areas crossed by the Project that are in agricultural production. Further, construction of the Project will result in approximately 60.4 acres of impacts to forested areas, of which 10.7 acres are new temporary disturbance associated with the Line 4 pipeline construction. Of the 60.4 acres, 10.6 acres will be converted to permanent impacts for the new Line 4 Right-of-Way that will be maintained free of large-diameter trees and will be disturbed associated with the authorized Line 3 Replacement Project. Although construction of the Project will have temporary and permanent impacts on forested lands, Enbridge does not anticipate that the forestry industry will be impacted because the clearing of the Right-of-Way and workspaces areas will not appreciably reduce the lands available to forestry.

Environmental Justice

Enbridge initiated this Project in response to the request from the Fond du Lac Band, and this Project is intended to improve the environment for the Fond du Lac Band Community. One of the purposes of this Project is to meet environmental justice goals on the Fond du Lac Band Reservation.

6.2.3 Operations Impacts and Mitigation

Human Populations and Socioeconomics

Project operations and maintenance will have no long-term effects on human settlements or populated areas. Long-term benefits to the Fond du Lac Band Community will enable subsequent removal of the existing above-grade pipe to enable better land accessibility to the Fond du Lac Band Community, improving the use of this area to actively practice traditional activities.

The Project will be operated with current Enbridge staff. Long-term economic benefits associated with operation of the Project will include increased tax revenues at the state and county levels in the form of property and/or ad valorem taxes. The rough estimate tax benefit for St. Louis and Carlton County combined is at least $2M per year over and above the existing tax revenue from Line 4.

The Project will not have permanent economic impacts on forestry because, other than the new Right-of-Way, the construction workspace will be allowed to regenerate naturally.

Operation of the Project will not impact future mining activities at the two possible sand and gravel pits (see Section 6.7). Because Enbridge is not aware of other potentially recoverable mineral resources within the Preferred Route, Enbridge does not currently anticipate that the operation of the Project will otherwise impact mining operations.

Environmental Justice

In regards to Environmental Justice, Enbridge is doing this project at the request of the Fond du Lac Band, and the Project will be benefit to the Community.

6.3 Transportation

6.3.1 Existing Environment

Roads

The Project will cross county, city/township, and private roads. In total, the Preferred Route will cross 9 roads as detailed in Table 6.3.1-1.

Table 6.3.1-1
Roads Crossed by the Fond du Lac Band Line 4 Project

County	Milepost	Road Name	Road Type	Paved/ Unpaved	Township/ City	Road Crossing Type
St. Louis	1060.1	Arrowhead State Forest Road	Private	Unpaved	Arrowhead	Open Cut
Carlton	1062.5	Township Road 535	City/County	Unpaved	Perch Lake	Open Cut
Carlton	1064.2	Township Road 536	Private	Unpaved	Perch Lake	Open Cut
Carlton	1065.7	Ditchbank Road	City/County	Paved	Cloquet	Bore
Carlton	1066.3	Magney Drive	Township	Paved	Perch Lake	Open Cut
Carlton	1066.6	Cary Road/CR-7	City/County	Paved	Cloquet	Bore
Carlton	1067.3	Driveway	Private	Unpaved	Cloquet	Open Cut
Carlton	1068.5	Strand Road	Township	Unpaved	Perch Lake	Open Cut
Carlton	1069.5	Reponen Road	Township	Unpaved	Perch Lake	Open Cut

The road crossing methods include either open cut or bore method. The bore method road crossing is represented in Figure 25 of the EPP (Appendix B).

Railroads

The Project will not cross any active or inactive railroads.

Airports

According to data from MNDOT, there are no airports within a one-mile radius of the Preferred Route.

6.3.2 Construction Impacts and Mitigation

Roads

Construction activities could result in short-term impacts on transportation infrastructure and traffic. The traffic volume along roads close to the pipeline could increase due to the movement of construction equipment, material, and crews. Temporary road closures may be required; however, Enbridge will try to avoid road closures during peak-traffic periods. Impacts on local traffic levels during construction will be temporary and minor. Construction across any paved

roads, highways, or roadways will be subject to the requirements of the necessary road crossing permits. Enbridge will obtain these permits prior to the start of construction.

The pipeline will be installed under paved roads using the boring method as indicated in Table 6.3.1-1. This method will avoid disturbance of the road surface and allow traffic to continue to use the road unimpeded by the installation of the pipe. However, some local traffic congestion may result as passing motorists slow down to view the construction and when construction vehicles cross the road or park along the road near the Right-of-Way. These impacts will be temporary and localized, occurring only during construction.

The open-cut construction method typically will be used to cross unpaved roads as indicated in Table 6.3.1-1 (6 of the 9 road crossing will be unpaved roads). This construction method will require temporary closure and detours. If no reasonable detour is available, at least one traffic lane will be maintained, except for brief periods during installation of the pipe. Disturbances at each open-cut road crossing will typically be limited to one day and are not expected to have a substantial effect on local traffic patterns. Safety measures such as detours, warnings, traffic control, and safety signs will be implemented as needed and prescribed by local (county) departments of transportation. Enbridge will attempt to avoid road closures during peak-traffic periods.

Access to most of the construction workspace will be obtained using pre-existing public and private roads. Any damage to roads due to Project construction-related activities will be repaired by Enbridge to the extent practicable.

6.3.3 Operations Impacts and Mitigation

Roads

No long-term effects are expected on roads crossed by the Preferred Route. The function of roads will be restored after construction including, but not specifically limited to: full restoration of vehicular traffic that may have been impeded during construction; repair of damage to the road surface caused by construction; and removal and restoration of access points that were installed to facilitate ingress/egress to the construction workspace. Enbridge will also mitigate and restore any temporary road impacts that may result from subsequent Project maintenance activities.

6.4 Noise

6.4.1 Existing Environment

The Project will involve relocation of an existing pipeline segment. Because the Project does not involve the installation of pump stations, a baseline noise analysis was not completed. Typically, noise contributions come from the pump station equipment during operating conditions. Ambient noise levels are expected to range from 30-40 decibels on the A-weighted Scale (dBA), with higher baseline levels in more developed sections. Although some modifications to the station may be required, the noise levels will not change, and the Minnesota Pollution Control Agency (MPCA) Noise Standards will continue to be met.

6.4.2 Construction Impacts and Mitigation

The heavy equipment needed to construct the Project will have an intermittent and temporary impact on existing noise levels in the vicinity of the construction workspace. Typical pipeline construction equipment (including bulldozers, loaders, backhoes, and sideboom tractors) generate from 80 to 90 dBA within 50 feet of the equipment. The equipment noise will be limited to the period of construction. Because the Preferred Route crosses primarily rural and undeveloped areas, the general public should experience limited increases to existing noise levels. Band members would be impacted to a greater degree than the general public due to their use of the Reservation, but impacts would be temporary and limited to the period of construction. Equipment noise is expected to dissipate to levels within State daytime residential standards (<60 dBA) within 500 to 1,500 feet of the equipment depending on initial source level. Enbridge reviewed aerial photography and identified 33 noise sensitive receptors within 500 feet of the construction workspace, and 54 noise sensitive receptors between 500 feet and 1,500 feet of the construction workspace. The identified noise receptors were residential structures.

In the vicinity of residential areas, the contractor will take reasonable measures to control construction-related noise, including limited pipeline construction activities to daylight hours when possible, maintaining equipment in good working order, and utilizing manufacturer-supplied silencers when available.

6.4.3 Operations Impacts and Mitigation

Following construction, noise will not be generated by the pipeline during normal operations. Maintenance activities on the new Right-of-Way may generate some noise but these activities and the associated noise will be temporary and intermittent, consistent with noise levels experienced during normal maintenance activities on the existing Line 4 pipeline segment.

A small amount of operational noise will be generated at the valve sites; however, the sound level associated with the operation of the valve sites will be low and will not likely be perceptible outside of the new Right-of-Way during normal operations.

6.5 Land Use

6.5.1 Existing Environment

Land Ownership and Land Cover

As shown in Table 6.5.1-1 and Figure 6.5.1-1, the Preferred Route predominantly crosses private lands (approximately 43 acres or 25 percent), Tribal trust lands (approximately 48 acres or 29 percent), and Tribal fee lands (approximately 30 acres or 18%). The Preferred Route also crosses state lands owned and managed by various state agencies (approximately 28 acres or 17 percent), lands owned by the state but administered by the county (tax-forfeit lands) (approximately 12 acres or 7 percent) and county land (approximately 7 acres or 4 percent). The land ownership data was collected in the field and includes the pipeline construction footprint (168 acres). Public and designated lands are described in more detail in Section 6.6.

Land cover along the Preferred Route was classified using Minnesota Land Cover Classification System (MLCCS) digital data (MNDNR, 2018c), as well as through interpretation of recent aerial photography for the pipeline construction footprint (168 acres) and access roads (5 acres). The MLCCS data set includes detailed vegetation and land use patterns for Minnesota, and includes natural/semi-natural or cultural (developed) land use types. For the Project, the land use classes in the data set were combined into the following four general categories based on prevalent land use and vegetation cover types: forest land, wetland/open water, open land, and developed land.

As shown in Table 6.5.1-1, the Preferred Route predominant land cover within the overall Project construction workspace crosses wetlands/open water covering approximately 85 acres (or approximately 49 percent). Forest land accounts for approximately 60 acres (or approximately 35 percent) of the overall Project construction workspace. Open land consists of approximately 22 acres (or approximately 13 percent) within the overall Project construction workspace. Developed comprises approximately 6 acres (or approximately 3 percent) within the overall Project construction workspace.

Table 6.5.1-1
Ownership and Cover of Lands Crossed by the Fond du Lac Band Line 4 Project

Ownership [a]	**Totals (acres)**	**Percentage**
Private Lands	43	25%
Tribal Trust	48	29%
Tribal Fee	30	18%
State Lands (state-administered)	28	17%
State Lands (county-administered)	12	7%
County Land	7	4%
Total	**168**	**100%**
Cover [b]	**Totals (acres)**	**Percentage**
Wetland/Open Water	85	49%
Forest Land	60	35%
Open Land	22	13%
Developed Land	6	3%
Total	**173**	**100%**

[a] Enbridge field collected data within the Line 4 pipeline construction footprint. Land ownership does not include access roads.

[b] Calculations in this table are based on Minnesota Land Cover Classification System digital data (MNDNR, 2018c) and Enbridge aerial interpretation and do not reflect information gathered from field surveys. Land cover includes both construction footprint and access roads.

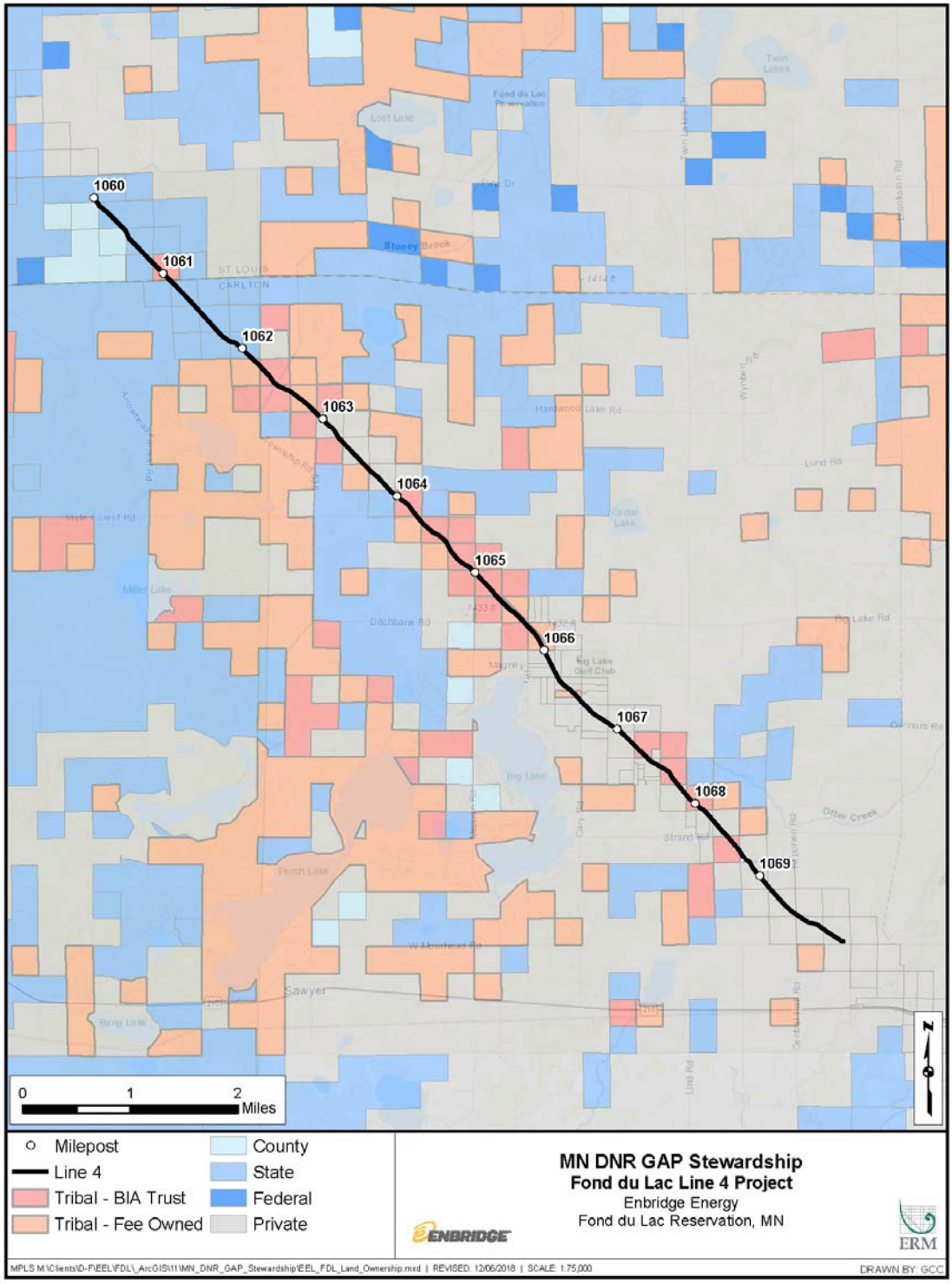

Figure 6.5.1-1 Fond du Lac Band Line 4 Project Land Ownership

6.5.2 Construction Impacts and Mitigation

Land Ownership and Land Cover

Enbridge has been working with the Fond du Lac Band, private landowners, and the appropriate county, state, and federal land-managing agencies to ensure that the Project is designed and constructed in a manner that is consistent with the necessary easements, permits, or licenses to cross these lands. The Project will require new easements for the designated route. As of December 2018, easements have been acquired on 61 percent of the Preferred Route.

Table 6.5.2-1 summarizes the breakdown by land use category of the potential construction impacts of the Project. Calculations in Table 6.5.2-1 are based on MLCCS digital data (MNDNR, 2018c) and Enbridge aerial interpretation and do not reflect information gathered from field surveys. Temporary disturbance refers to temporary construction areas for the Preferred Route and is divided into the following categories: Planned disturbance associated with Enbridge's authorized Line 3 Replacement Project and areas of new disturbance associated with the Project. Permanent impacts are addressed in Section 6.5.3 below. Appendix G.1 provides a detailed breakdown by land use and county of the Project's potential construction impacts.

TABLE 6.5.2-1
Fond du Lac Band Line 4 Project Construction Impacts by Land Cover Type (acres)

Project Component	Land Use	Disturbance Type	Total [a]
Pipeline Construction	Developed	Planned Disturbance for Line 3R [b]	3.5
		New Disturbance [c]	1.4
	Forest Land	Planned Disturbance for Line 3R [b]	46.2
		New Disturbance [c]	10.7
	Open Land	Planned Disturbance for Line 3R [b]	20.7
		New Disturbance [c]	1.2
	Wetland/Open Water	Planned Disturbance for Line 3R [b]	70.1
		New Disturbance [c]	14.3
Pipeline Construction Total			**168.1**
Access Roads	Developed	Temporary	0.9
		Permanent	0.0
	Forest Land	Temporary	3.5
		Permanent	0.0
	Open Land	Temporary	0.4
		Permanent	0.0
	Wetland/Open Water	Temporary	0.5
		Permanent	0.0
Access Roads Total			**5.3**
Grand Total (acres)			**173.4**

[a] Calculations in this table are based on Minnesota Land Cover Classification System digital data (MNDNR, 2018c) and Enbridge aerial interpretation and do not reflect information gathered from field surveys.

[b] Areas of planned disturbance for Enbridge's Line 3 Replacement Project. Includes temporary construction workspace and new Right–of-Way.

[c] New disturbance for the Fond du Lac Band Line 4 Project. Includes temporary construction workspace.

Developed Land

The Project will result in approximately 5.8 acres of temporary impact to developed land, of which 1.4 acres are new temporary disturbed areas associated with pipeline construction (see Table 6.5.2-1). Based on examination of aerial photographs and GIS data, there are two residences within 50 feet of the construction workspace and 162 residences within a half mile of the construction workspace.

During construction, temporary land use impacts may occur to residential land due to short-term increases in construction-related noise and dust. Construction-related dust emissions will generally be of short duration and dependent on soil type, weather conditions, and the extent of ground disturbance. Some minor dust emission is inevitable on any construction project; however, the construction workspace and access roads near residential areas will be sprayed with water as needed to control dust during active construction. After construction is completed, measures to stabilize and revegetate the Right-of-Way will prevent ongoing dust emissions. Planned disturbance of areas by other construction activities before the Line 4 Project may increase the likelihood of invasive species in these areas. Short-term increases in ambient noise levels will occur due to construction equipment used to install the pipeline. Further details regarding noise impacts are described in Section 6.4.

Forest Land

Construction of the Project will impact approximately 60.4 acres of forested areas, of which 10.7 acres are new temporary disturbance associated with pipeline construction (see Table 6.5.2-1). Of the 60.4 acres, 10.6 acres will be converted to permanent impacts for the new Line 4 Right-of-Way that will be maintained free of large-diameter trees. After construction, tree regeneration will be permitted to occur naturally in the cleared forest land outside the new Line 4 Right-of-Way and within the temporary construction workspaces.

Based upon information gathered from the Fond du Lac Band interactive mapping tool, the portions of the Project mapped as forested land use are zoned as Natural Resource Management parcels (Fond du Lac Band, 2019a). The purpose of the Natural Resources Management zoning status is to allow for forest, wildlife, and fish management and to sustain and enhance areas for traditional hunting, fishing, and gathering (Fond du Lac Band, 2019b). Construction impacts to forested areas would remove portions of these lands from their zoned land use. The majority would eventually return to their original land cover type following restoration.

Enbridge will compensate MNDNR for any merchantable timber loss on state-managed forest lands. Compensation for merchantable timber on private lands is agreed upon between Enbridge and the landowner during easement acquisition. The value of merchantable timber is determined through discussions with the landowner and appraisals as needed. The construction and operation of the pipeline will prevent future use of the new Right-of-Way to produce merchantable timber; however, landowners (including the state) will be compensated

for the value of the land within the new Right-of-Way. Enbridge will also acquire all applicable Fond du Lac Band Reservation permits for timber removal.

Open Land

Construction of the Project will result in approximately 22.3 acres of new temporary impact on open land, of which 1.2 acres are new temporary disturbed areas associated with pipeline construction (see Table 6.5.2-1). After final construction clean-up, the open land in upland areas will be restored. Planned disturbance of areas by other construction activities before the Line 4 Project may increase the likelihood of invasive species in these areas. Restoration and revegetation measures are outlined in Section 4.2.9.

Wetland/Open Water

The Project will result in approximately 84.9 acres of temporary impact to wetlands and open water during construction, of which 14.3 acres are new temporary disturbed areas associated with pipeline construction (see Table 6.5.2-1). This is based on land cover data and is not based on the Enbridge's field delineation of wetlands and waterbodies. Enbridge has reduced the construction workspace width to 115 feet when crossing wetlands and waterbodies, and 135 feet when crossing saturated wetlands to reduce impacts. Construction impacts associated with wetland and waterbody crossings are discussed in Sections 6.14 and 6.15.

Associated Facilities

The Project will involve the following valve site work: the removal of an existing mainline valve at the existing MP 1060 valve site; the installation of a new mainline valve at MP 1062; and the removal and replacement of an existing mainline valve at MP 1070. The majority of construction of these valves will be temporarily impacts of approximately 0.055 acre as the valve sites will already be constructed as part of the Line 3 Replacement Project. Approximately 0.03 acre will be permanent converted to upland area to accommodate a valve for the Project.

6.5.3 Operations Impacts and Mitigation

Land Ownership and Land Cover

In general, land ownership will not change, but Enbridge will acquire easements necessary to construct and operate the Project. In some locations, Enbridge may acquire parcels in fee, such as for valve sites. Enbridge will also be acquiring Right-of-Way grant from the Bureau of Indian Affairs for crossing Tribal Trust and Allottee Trust Parcels. The Right-of-Way Application has been submitted and is currently being processed by the Bureau of Indian Affairs.

Operation of the Project will result in new permanent disturbance of 36.8 acres associated with the Line 4 new Right-of-Way. The predominant land use within the new Right-of-Way is wetland and open water, which covers 22.2 acres (or approximately 60 percent). Other land uses in the Right-of-Way are forest land 10.6 acres (or approximately 29 percent), open land 3.5 acres (or approximately 10 percent), and developed land 0.5 acre (or approximately 1 percent). As further discussed in Section 6.9, the new Right-of-Way will be maintained in an herbaceous state by removing woody shrubs, which will result in a conversion of 10.6 acres of forested area to open land for the life of the Project. All of the permanent conversion of forested land will be located in areas authorized for disturbance associated with the Line 3 Replacement Project. All other land cover types will revert to their previous cover type following restoration activities, with the exception of valve sites discussed below in Associated Facilities.

Temporary land cover impacts may also result from Project maintenance activities that require excavation. Access to forested areas, private land, and lands administered by MNDNR (see Section 6.6) will be maintained during operations and maintenance activities. Impacts to forest land and other vegetation types are discussed in Sections 6.9 and 6.10. Wetland and waterbody impacts are addressed in Sections 6.14 and 6.15.

Associated Facilities

Valves located along the Preferred Route will impact a total of 0.055 acre by installing a perimeter fenced in gravel area with task lighting. The valves will also include instrument building, valve stem, associated instrumentation, and electrical service meter within the fenced area.

6.6 Public and Designated Lands

Enbridge initiated Project consultation with the MNDNR as part of the Project. Enbridge will continue to communicate with the MNDNR and other permitting agencies on items that arise from the initial Project consultations as well as items that are ongoing from previous correspondence between the agencies and Enbridge.

6.6.1 Existing Environment

The Project will cross 2.3 miles of the Fond du Lac State Forest, of which approximately 1.0 mile is land, administered by MNDNR (see Table 6.6.1-1 and Figure 6.6.1-1). Enbridge will continue to work with MNDNR to acquire a license for the crossing of state lands.

Table 6.6.1-1
State Forest Crossed by the Fond du Lac Band Line 4 Project

County	State Forest	Milepost Range	Crossing Length (miles)
Carlton	Fond du Lac State Forest	1060.0 – 1062.3	2.3

The Preferred Route will not cross national parks, national natural landmarks, national wilderness areas, national wildlife refuges, national forests, scenic trails, or national waterfowl production areas. The Preferred Route will not cross any waterbodies listed on the U.S. National Park Service (USNPS) National Rivers Inventory (NRI) as designated or potentially designated National Wild and Scenic Rivers (USNPS, 2016); however, the Project will cross tributaries that flow into rivers listed on the NRI.

The Project will not cross any Wildlife Management Areas (WMAs), Aquatic Management Areas (AMAs), Scientific and Natural Areas (SNA), or designated State Recreational Areas. The Project will not cross any state-designated trails, but is within 0.2 mile of the Fond du Lac State Forest Trails near MP 1060.3. The Project will not cross Wild and Scenic Rivers, any canoe and boating routes or any county-administered parks. The Preferred Route will not cross any designated scenic byways, any conservation easements, or other types of public lands.

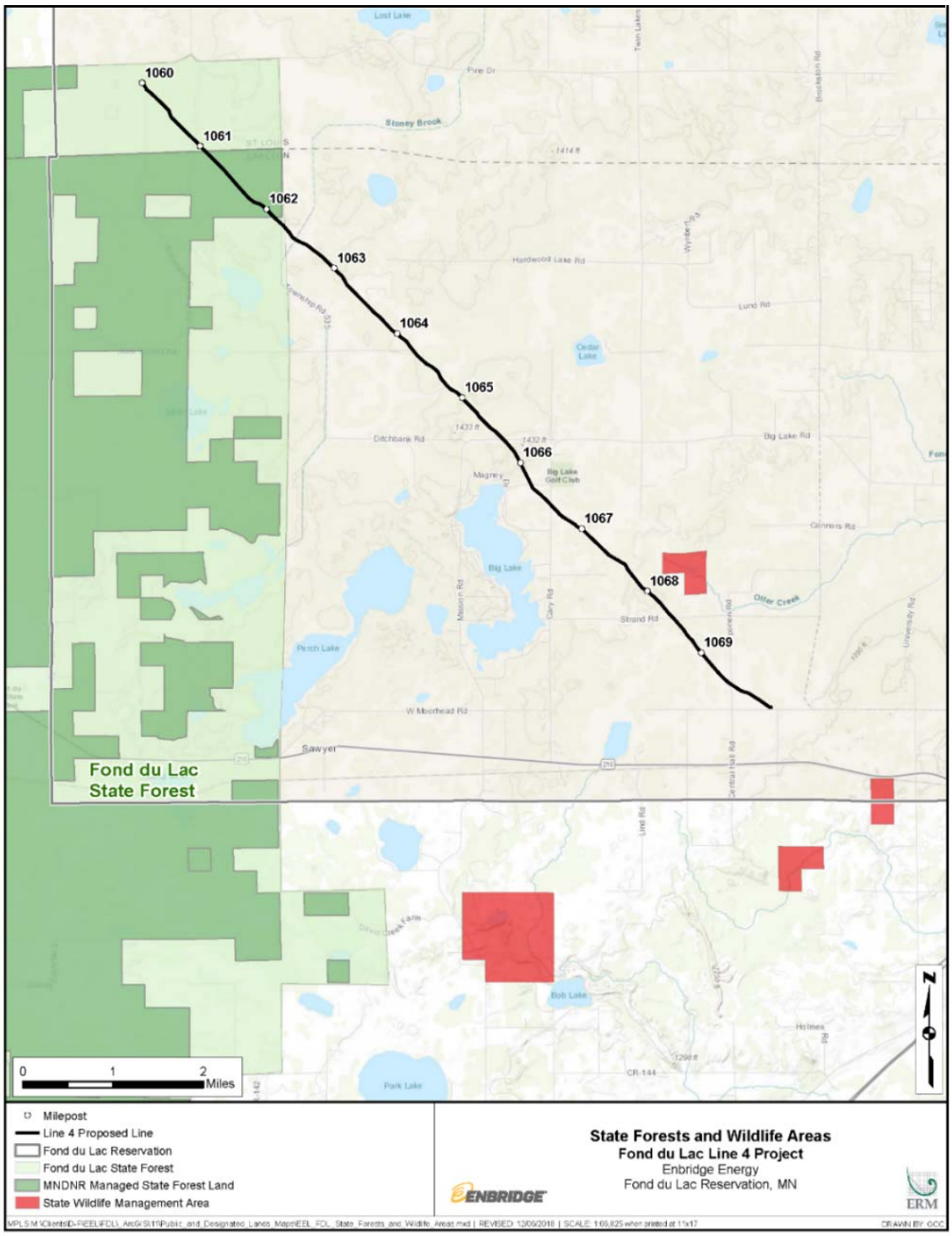

Figure 6.6.1-1 State Forest and Wildlife Areas

6.6.2 Construction Impacts and Mitigation

The Project will only cross the Fond du Lac State Forest and only minor and temporary impacts are expected on the state-designated recreational lands. As described in Section 5.0, the Preferred Route is 100 percent co-located with the existing Enbridge Mainline System and will therefore minimize potential impacts on public lands and recreational areas. In addition, Enbridge plans to construct the Project consecutively with the Line 3 Replacement Project, which will further minimize cumulative impacts associated with the Project.

Impacts on state recreational areas will involve temporary inconveniences and localized disturbances, including noise, dust, and visual intrusions associated with construction activities near recreational areas.

Enbridge will maintain public access to state-designated recreational areas during construction to the extent safe and practicable. Access to state recreational areas in the immediate construction areas may be limited or restricted during excavation and pipeline installation activities. Potential impacts on state recreational activities due to restricted access will be minimal and dependent on the timing of construction, the season in which the recreational activity occurs, and the construction methods used. Temporary closures of some areas may be necessary during construction. Enbridge will post signs as needed to notify the public of construction and will install safety fencing around open trenches at public access locations during periods of inactive construction as necessary. After construction is complete, state recreational areas will be restored to allow previous uses and recreational activities to continue.

6.6.3 Operations Impacts and Mitigation

Impacts on public and designated land areas during operations will involve localized disturbances, including temporary impacts associated with maintenance activities that require excavation, mowing, and visual intrusions associated with valve sites and new access roads.

Vegetation maintenance of the new Right-of-Way, as discussed in Section 6.9, may have visual impacts on public forest lands. Access to public recreational lands and recreational activities will not be restricted or impacted by Project operations or maintenance activities.

Following final restoration after installation of the pipeline, Enbridge will allow operational access across the pipeline for MNDNR vehicles and forest logging equipment for timber management as long as the crossings do not pose a risk to the safe operation of the pipeline. These crossings are expected to be existing roads that will be agreed upon by MNDNR and Enbridge.

Enbridge will continue coordinating with MNDNR to address the balance between resource impacts, landowner needs, and maintenance and safety considerations.

6.7 Geology

6.7.1 Existing Environment

Bedrock and Surface Geology

The topography crossed by the Project is relatively flat due to a long period of erosion and repeated glaciation. Elevations in the Project vicinity range from approximately 1,284 to 1,444 feet above mean sea level (Table 6.7.1-1).

Table 6.7.1-1
Elevation within the Fond du Lac Line 4 Project Vicinity

County	Elevation Above Mean Sea Level (feet)		
	Lowest	Average	Highest
St. Louis	1,299	1,333	1,359
Carlton	1,284	1,317	1,444

Regional maps of depth-to-bedrock generally lack sufficient resolution to identify areas where bedrock occurs at specific depths. Accordingly, the depth to bedrock in a specific location is difficult to determine without sampling. Generally, the bedrock along the Preferred Route is far below the surface and can exceed 400 feet in depth (University of Minnesota, 2018). Bedrock could also be encountered in areas where the pipeline is installed using HDD techniques. The HDD crossing method will not be utilized for this project and therefore bedrock should not be encountered.

The area crossed by the Project has been tectonically stable for more than 500 million years. Therefore, there is a low probability of an earthquake of significant intensity or other seismic event in the Project vicinity (National Atlas of the United States, 2013).

Mineral Resources

Enbridge determined that 1,500 feet was a reasonable distance for evaluating mineral resources that could potentially be impacted by the Project, based on consideration of the potential for expansion of existing resources. The Preferred Route does not cross any mined or mineral resource areas but there are two sites, possibly associated with non-metallic resources (one gravel pit and one sand pit) that are approximately 1,500 feet from the construction workspace. Table 6.7.1-2 identifies possible mining and mineral resource areas within 1,500 feet of the Preferred Route.

Table 6.7.1-2
Mineral Resources within 1,500 Feet of the Fond du Lac Band Line 4 Project[1]

County	Milepost	Operation	Distance and Direction from ROW	Comments
Carlton	1065.8	Gravel Pit	1,500 ft NE	Located at the corner of Enger Rd. and Ditchbank Rd.
Carlton	1066.0	Sand Pit	1,500 ft W	Located 300 ft. North of Magney Drive

[1] Data collected from MNDNR Aggregate Resources Web Map

The Project will not cross any metallic mineral exploration tracts through the Fond du Lac Band Reservation. Enbridge is not aware of any other county- or state-owned metallic mineral rights crossed by the Project that are actively leased to exploration or production companies. Similarly, the Preferred Route will not cross any bedrock greenstone belt terrain. Greenstone belt terrain is primarily located in northwestern Minnesota and is characterized by variably metamorphic rock that has undergone a change in existing rock structure or composition induced by location, chemicals, or temperature. Greenstone belt terrains have the potential to contain gold mineralizations.

Enbridge initiated Project discussions with MNDNR regarding early coordination review of the Project. Enbridge expects that this consultation will, among other things, identify any additional crossings of Public Lands and/or Public Waters that will need further encumbrance determinations for metallic, aggregate, and/or peat resources. Enbridge will continue to coordinate with MNDNR on items that arise from the initial Project consultations as well as items that are ongoing as they pertain to the Project.

Paleontology

Based on the thickness of the unconsolidated glacial material in the vicinity of the Project, significant paleontological resources are not likely to be encountered during construction. Enbridge consulted with the Minnesota Geological Survey and confirmed that paleontological finds are not common in the northern half of Minnesota.

6.7.2 Construction Impacts and Mitigation

Bedrock and Surface Geology

No unique geological features that have received state or federal protection will be disturbed by the Project. Construction of the Project will result in minor impacts on topography and geology. Primary impacts will consist of temporary alteration of slopes on the construction workspace due to grading and trenching operations. These disturbances will be necessary to create a level and safe construction area.

After the pipe is installed, Enbridge will backfill the trench with native material and return surface contours to pre-construction conditions. In some cases, surface geology can affect how a pipeline is installed. Because the Project will not cross any known bedrock outcrops or shallow bedrock areas, Enbridge does not anticipate any blasting will be required.

After the trench is backfilled, Enbridge will stabilize the Right-of-Way with erosion control measures as necessary (e.g., installation of slope breakers, temporary sediment barriers, and permanent trench breakers, as well as the revegetation and mulching of the construction workspace). Refer to Sections 1.9, 1.17, and 7.0 of the EPP (Appendix B) for additional information on erosion control measures.

6.7.3 Operations Impacts and Mitigation

Bedrock and Surface Geology

Operational impacts to bedrock or surface geology will be limited to temporary impacts associated with maintenance activities that require excavation. If such excavations are required they will be in areas previously impacted by pipeline construction. Moreover, these areas will be restored when the excavations are complete. There is minimal risk of earthquake-related impacts on the pipeline during operations due to the limited potential for large, seismically induced ground movements. As such no additional mitigation beyond designing the pipeline to currently accepted industry specifications is required to operate the pipeline.

6.8 Soils

6.8.1 Existing Environment

General Soil Composition

The Project will cross Land Resource Region (LRR) K: Northern Lake States Forest and Forage Region. Within this region it will cross two Major Land Resource Areas (MLRA) 90A: Wisconsin and Minnesota Thins Loess and Till, Northern part; and 93A: Superior Stony and Rocky Loamy Plains and Hills, Western part. A landscape description of these MLRA and the dominant soil types of the MLRA is included in Table 6.8.1-1. The location of these MLRA relative to the pipeline route is shown on Figure 6.8.1-1.

Table 6.8.1-1
MLRA Crossed by the Fond du Lac Band Line 4 Project

MLRA Name	Landscape Description	Dominant Soil Types
Wisconsin and Minnesota Thin Loess and Till, Northern part (90A)	Gently undulating to rolling, loess-mantled till plains, drumlin fields, and end moraines mixed with outwash plains associated with major glacial drainage ways, swamps, and bogs.	Alfisols, Entisols, Histosols, and Spodosols
Superior Stony and Rocky Loamy Plains and Hills, Western part (93A)	Dominated by drumlin fields, moraines, small glacial lake plains, outwash plains and bedrock-controlled uplands.	Entisols, Inceptisols, and Histosols

The above-mentioned MLRA generally range from somewhat poorly drained soils with sandy to clayey textures to well or excessively drained soils. (USDA Natural Resources Conservation Service [NRCS], 2006).

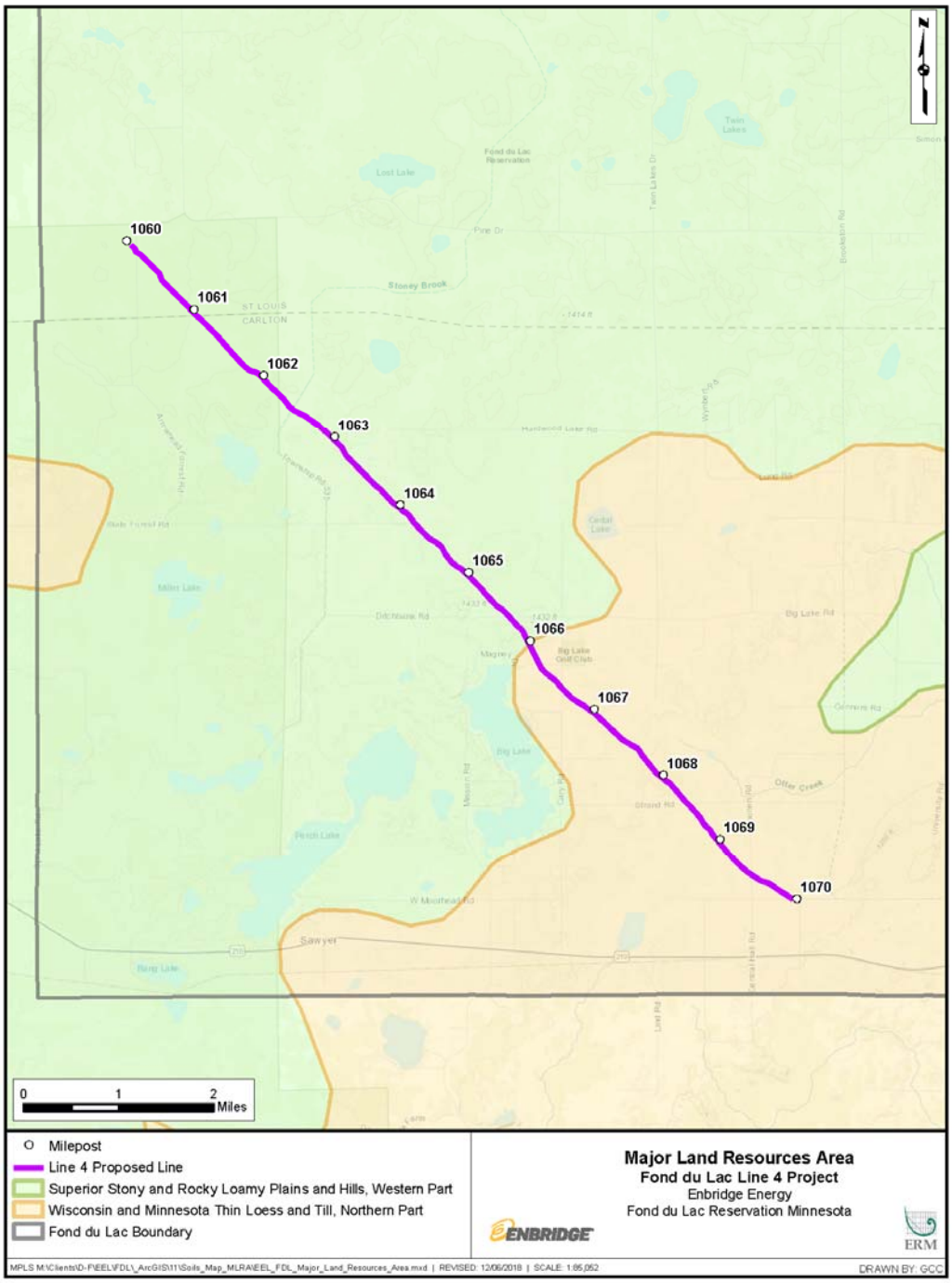

Figure 6.8.1-1 Major Land Resource Areas

Soil Characteristics and Assessments

Enbridge digitized and overlaid the Preferred Route onto SSURGO[3] database data to identify soil mapping units within the Project construction workspace. Based on that analysis, Enbridge identified soil characteristics that could affect or be affected by Project construction. These characteristics include highly erodible soils, prime farmland, hydric soils, compaction-prone soils, presence of stones and shallow bedrock, droughty soils, depth of topsoil, and percent slope.

Table 6.8.1-2 provides a summary of significant soil characteristics identified along the Preferred Route by county according to the SSURGO database. Individual soil characteristics are discussed separately in the following sections.

Table 6.8.1-2
Soil Characteristics within the Fond du Lac Band Line 4 Project

County	Total Acres in County [a]	Prime Farm-land [b]	Farmland of Statewide Importance	Hydric Soils	Compact Prone	Highly Erodible		Droughty	Stony/ Rocky	Shallow Bedrock
						Water	Wind			
	Acres									
St Louis	22.2	0.0	12.1	16.7	9.7	0.0	4.4	0.0	14.1	0.0
Carlton	151.2	3.9	52.1	63.5	5.7	34.6	36.8	54.6	51.6	0.0
Total [c]	**173.4**	**3.9**	**64.2**	**80.2**	**15.4**	**34.6**	**41.2**	**54.6**	**65.7**	**0.0**

[a] Acreage is based on the construction workspace dimensions as discussed in Table 6.1.3-1 and Figures 6.1.3-3 through 6.1.3-5 in Section 6.1.

[b] Includes prime farmland soils and soils considered prime farmland if limiting factors are mitigated. All soils classified as prime farmland are 'prime farmland if drained.

[c] The total of all categories is greater than the total acres of the Project workspace due to the SSURGO dataset having overlapping features, causing some areas to be over-represented.

6.8.2 Construction Impacts and Mitigation

The Preferred Route crosses approximately 64.2 acres (approximately 37 percent) of soils classified as farmland of statewide importance (Table 6.8.1-2). Section 1.10 of the EPP describes mitigation measures that will be implemented during construction to minimize impacts to soils classified as farmland of statewide importance.

The Project also crosses approximately 54.6 acres (approximately 31 percent) of soils classified by USGS as droughty soils (see Table 6.8.1-2). Enbridge will minimize the impacts of construction on droughty, non-cultivated soils by timely reseeding using species tolerant of dry

[3] Soil Survey Geographic (SSURGO) database (USDA NRCS, 2014). The SSURGO database is a digital version of county soil surveys developed by NRCS for use with GIS.

conditions and by applying mulch to conserve soil moisture. Enbridge will work with NRCS and Fond du Lac to review seed mixes proposed in the EPP (Appendix B), and seeding dates adapted to the Project, including droughty soil areas.

To minimize topsoil disturbance and topsoil/subsoil mixing associated with construction, Enbridge will remove and segregate topsoil in hay fields, pasture, residential areas, and other areas as requested by the landowner or as specified in the Project plans, commitments, and/or permits. The maximum depth of topsoil stripping will be 12 inches. If less-than-specified maximum depths of topsoil are present, the topsoil will be segregated to the depth that is present. The segregated topsoil and subsoil will be stockpiled separately and replaced in the proper order during backfilling and final grading of the construction workspace. Implementation of proper topsoil segregation will aid in successful post-construction revegetation, and minimize the potential for long-term erosion problems.

The Preferred Route crosses approximately 15.4 acres (approximately 9 percent) of soils that are prone to compaction (see Table 6.8.1-2). Enbridge will minimize compaction and rutting impacts by constructing from timber mats or using low-ground-weight equipment where warranted (e.g., in saturated wetland soils). Enbridge will also take steps to mitigate the effects of compacted soils. In uplands this may include deep tilling and/or plowing soils where compaction has been noted. If subsequent construction and cleanup activities result in further compaction, additional measures will be undertaken to reduce soil compaction. See Section 1.18 of the EPP (Appendix B) for additional information on compaction minimization techniques.

The majority of the Preferred Route is underlain by soils that are not likely to be susceptible to water erosion. Water erosion soils makes up approximately 34.6 acres (approximately 20 percent) of the Preferred Route (see Table 6.8.1-2); these soils are generally found on terrain with slopes that are less than or equal to five percent. In addition, approximately 41.2 acres (approximately 24 percent) of the soils along the Preferred Route are considered susceptible to wind erosion.

Enbridge will implement erosion control measures to minimize erosion both during and after construction activities as necessary. These measures may include construction of silt fences, installation of slope breakers, temporary sediment barriers, permanent trench breakers, revegetation, and mulching of the construction workspace. Erosion and sediment controls will be inspected and maintained as necessary until final stabilization is achieved. Enbridge will also implement dust mitigation measures, including the use of water trucks to moisten the construction Right-of-Way, as needed, to reduce impacts from wind erosion.

During construction, there is a potential for soil contamination if there is an equipment spill and/or leakage of fuel, lubricant, or coolant. Enbridge's implementation of the practices outlined in the EPP (Appendix B) will help avoid or minimize this risk and any other operational impacts on soils.

Associated Facilities

Valves proposed for the Project are located within the construction workspace and will account for approximately 0.055 acre of disturbance.

6.8.3 Operations Impacts and Mitigation

Operations impacts to soils will be limited to sporadic and temporary disturbance during maintenance activities in discrete locations. If excavation is required during maintenance activities, soils will be restored to pre-maintenance conditions as soon as is reasonable following completion of the maintenance work. Right-of-Way clearing and mowing activities performed during maintenance activities have a very low potential to compact soils due to the small size of the equipment and minimal number of passes across a given area. During operations, there is a potential for soil contamination if there is an equipment spill and/or leakage of fuel, lubricant, or coolant. Enbridge's implementation of the practices outlined in the EPP (Appendix B) will help avoid or minimize this risk and any other operational impacts on soils.

Associated Facilities

Valves proposed for the Project are located within the new Right-of-Way and will account for approximately 0.055 acre of disturbance.

6.9 Vegetation

6.9.1 Existing Environment

Cover Types

Section 6.5 (Land Use) provides further details regarding cover types, which also provides estimates of impacts to each cover type to be affect by Project construction and operation. This section further details potential impacts to vegetation associated with these cover types associated with construction and operation of the Project, as well as proposed mitigation measures.

Ecological Classifications

Based on Minnesota's Ecological Classification System (MNDNR, 2018a), the Project is located in the North Shore Highlands Subsection of the Laurentian Mixed Forest Province. The North Shore Highlands Subsection occupies the area adjacent to Lake Superior, and is underlain by soils formed in red and brown glacial till (see Section 6.8 for more information on soils). Pre-settlement vegetation was forest and consisted of white pine, red pine, jack pine, balsam fir, white spruce, and aspen-birch.

Sensitive Plant Communities

Native Plant Communities

Enbridge evaluated the occurrence of sensitive plant communities and wild rice waters along the Preferred Route using publicly available data layers from MNDNR, including Native Plant Communities (NPC), Minnesota Biological Survey (MBS) data, designated Calcareous Fens, and Railroad Right-of-Way Prairies. MBS data included a combination of publicly available Sites of Biodiversity Significance (SOBS) data and draft SOBS data provided directly to Enbridge by MNDNR. Enbridge also used interpretation of aerial photography by professional plant surveyors approved by MNDNR to identify sensitive plant communities. There are no wild rice waters crossed by the Project. Further, the only NPC crossed by the Preferred Route is the Northern Poor Fen (APn91), an acidic peatland system.

Fond du Lac Band Tribal Species of Concern

Enbridge completed surveys to identify tribal species of concern occurring within the Project. Further information regarding the results of the surveys and species identified are contained in Section 6.12.3.

Sites of Biodiversity Significance

Through the MBS program, MNDNR systematically collects, interprets, and delivers baseline data on the distribution and ecology of rare plants, rare animals, native plant communities, and functional landscapes to guide decision making. SOBS rankings are based on MBS data, which

MNDNR reviews before finalizing and making the data public. SOBS crossed by the Project are listed in Table 6.9.1-1.

Table 6.9.1-1
Sites of Biodiversity Significance Crossed by the Fond du Lac Band Line 4 Project

Site Name	SOBS Rank	County
Central Ditchbank Woods	Moderate[a]	Carlton
East of Bog Lake	Moderate[a]	St. Louis
Hasty Brook Wetlands	High[b]	St. Louis
Hasty Brook Wetlands	High[b]	Carlton
Rice Portage Wetlands	Moderate[a]	Carlton
West of Big Lake	Moderate[a]	Carlton
Wild Rice Lake Peatlands[c]	Moderate[a]	Carlton

[a] MNDNR defines Moderate as: Sites contain occurrences of rare species moderately disturbed native plant communities, and/or landscapes that have strong potential for recovery of native plant communities and characteristic ecological processes.

[b] MNDNR defines moderate High as: Sites contain very good quality occurrences of the rarest species, high-quality examples of rare native plant communities, and/or important functional landscapes.

[c] The Wild Rice Lake Peatlands is associated with Wild Rice Lake, located approximately 1.1 mile south of the Project. The Project will not cross any wild rice waters.

Due to the co-location of the Project with the Line 3 Replacement Project, the information gathered for NPC, SOBS, and other data on the Line 3 Replacement Project were used to identify sites for rare plant field surveys for the Fond du Lac Band Line 4 Project. These surveys included SOBS with a ranking of moderate or high crossed by the Preferred Route survey corridor. These areas were surveyed for rare and sensitive plant species. For results of the 2018 surveys, see Section 6.12 – Threatened, Endangered, and Sensitive Species.

Enbridge has not identified any sensitive forest resources within the Project area.

6.9.2 Construction Impacts and Mitigation

Herbaceous Areas

The clearing of herbaceous vegetation during construction will result in short-term vegetation impacts. Enbridge will seed disturbed areas following installation of the pipeline. This active revegetation measure and the anticipated rapid colonization of disturbed areas by annual and perennial herbaceous species will restore most of the herbaceous vegetative cover within the first growing season after construction.

Enbridge will revegetate disturbed areas in accordance with Section 7.0 of the EPP (Appendix B) unless otherwise directed by landowners, Fond du Lac Band, or land managing agencies. To the extent it is practicable to vegetate immediately after pipe placement, Enbridge will do so.

However, this may not be feasible if Enbridge constructs in winter conditions, or if the Right-of-Way is too wet to replace topsoil. Per Section 7.15 of the EPP (Appendix B), Enbridge will delay seeding during frozen ground conditions until the applicable spring seeding period or will complete dormant seeding where conditions allow (i.e., no snow cover). Timely restoration of the construction workspace and reseeding with an appropriate seed mix will minimize the duration of disturbance to herbaceous areas. Impacts on vegetation adjacent to the construction workspace will be minimized through adherence to soil erosion control specifications and by confining clearing activities to the approved Right-of-Way and extra workspaces.

Forested Areas

The clearing of woody shrubs and trees will be the primary long-term impact of the Project on vegetation. Woody shrubs and trees will be allowed to recolonize within the temporary construction workspace. However, recolonization of disturbed areas by woody shrubs and trees will be slower than recolonization by herbaceous species. As natural succession proceeds in these areas, it is anticipated that forested communities will eventually reestablish after a number of years.

Clearing could also affect undisturbed forest vegetation growing along the edges of the cleared areas. To prevent damage to adjacent trees, Enbridge will fell trees toward the cleared Right-of-Way. However, the creation of a new edge will expose some edge trees to elevated levels of sunlight and wind, which could increase evaporation rates and the probability of tree blowdowns. Where increased light levels penetrate the previously shaded interior, shade-intolerant species may be able to grow, and the species composition of the newly created forest edge may change. Clearing may 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 cleared Right-of-Way.

Noxious Weeds and Invasive Plant Species

Noxious weeds are defined in Minnesota Statutes as annual, biennial, or perennial plants injurious to public health, the environment, public roads, crops, livestock, or other property. The MNDNR maintains a list of state and federally-listed noxious weeds (MNDNR, 2018b). In addition, the Fond du Lac Band has developed a list of invasive species of concern within the Fond du Lac Band Reservation. Enbridge would address noxious and invasive species in accordance with the EPP (specifically Section 1.6 and Appendix B) and the Band's Invasive Species Management Plan. Further, Enbridge is working directly with the Fond du Lac Band regarding additional control and management of noxious and invasive plant species.

To minimize the introduction and increase of noxious and invasive plants, Enbridge will implement Best Management Practices (BMPs) including minimizing the time between final grading and permanent seeding, cleaning construction equipment, and preparing a seeding supplement to prevent the spread of noxious weeds and invasive plants. Section 1.6 of

Enbridge's EPP (Appendix B) describes these measures in more detail. This section of the EPP also explains topsoil segregation and conservation practices, which play a role in preventing the spread of noxious weeds and invasive plants. Finally, Enbridge has conducted surveys for terrestrial noxious weeds and invasive plant species in advance of construction activities. This survey information will provide background information to assist in implementing mitigation measures during construction.

Sensitive Plant Communities

Although no state-listed plant species occurrences are known within the Project based on Enbridge's consultations with the MNDNR for the Line 3 Replacement Project (Natural Heritage Information System search), the Project does cross through an area designated as Northern Poor Fen. Enbridge has completed surveys for rare and sensitive plants along the Preferred Route through this area. No rare or sensitive plant species were documented within the Project workspace located within the Northern Poor Fen.

6.9.3 Operations Impacts and Mitigation

Revegetation will take place following restoration, and seed mixes will be selected in accordance with Section 7.1 of Enbridge's EPP (Appendix B) and through consultation with the Fond du Lac Band, landowners, or land managing agencies. Use of compatible species and high-quality revegetation methods will help disturbed ground to blend in with the surrounding landscape.

Enbridge will maintain the new Line 4 Right-of-Way in a herbaceous state by removing woody shrubs and trimming branches overhanging the Right-of-Way approximately every five years. Vegetation that grows so that it obscures the visibility of the Right-of-Way for federally required surface condition inspections will be mechanically removed. These practices will result in the new Right-of-Way maintenance of approximately 10.6 acres of impacted forest land authorized as part of the Line 3 Replacement Project. The remaining areas of forest land temporarily impacted by construction of the Project will be seeded and then allowed to regrow naturally, which over time will reestablish the forest habitat.

Herbicides may be used during operations in limited situations, such as to control weedy species. If used, herbicides will be applied by properly licensed individuals and coordinated with the necessary regulators and landowners.

6.10 Wildlife

6.10.1 Existing Environment

Species and Habitats

The Project will be constructed through several ecosystem types, including deciduous forest, coniferous forest, wetland, and shrub land. Much of the Project will be developed within an existing Right-of-Way that consists of open grasslands and emergent wetlands. Wildlife habitats within these ecosystems are diverse. Existing wildlife resources along the Preferred Route are described below.

Agricultural Areas

No areas within the Project footprint are currently used for agricultural purposes such as hayfields, pastures, and row crop production.

Open Lands

Open lands affected by the Project consist primarily of grasslands with some scrub-shrub areas. The undeveloped, vegetated open lands likely support several species of birds, numerous small rodents, and several species of snakes. Species such as coyote, red fox, and a variety of raptors typically hunt open areas for varied prey. Other common wildlife species that may use open areas include ground squirrels, eastern cottontail rabbits, white-tailed jackrabbits, white-tailed deer, striped skunks, raccoons, weasels, and Virginia opossum. Common invertebrates that may occupy open areas include bees, grasshoppers, and butterflies.

Forested Areas

Forested areas are present along the edge of the existing Enbridge Mainline Corridor for the entire length of the Preferred Route. Mammalian species typical of Minnesota's deciduous forests include eastern chipmunks, black bears, snowshoe hares, gray squirrels, gray fox, porcupines, pine martens, and several species of bats. Some of these species also inhabit northern Minnesota's coniferous forests, while others, such as least chipmunks, snowshoe hares, and red squirrels, are more unique to evergreen forests. The structural diversity of forests provides a variety of habitats that can support a large number of avian species, including songbirds, game birds, and raptors.

Wetland and Riparian Areas

Wetlands affected by the Project consist primarily of woody wetlands, emergent herbaceous wetlands, and open water. The emergent wetlands and open water provide habitat for a variety of aquatic wildlife, including muskrats, beavers, mink, river otters, waterfowl, wading birds, and numerous species of reptiles and amphibians. The woody wetlands and riparian areas provide additional habitat for terrestrial wildlife, such as white-tailed deer, moose, gray wolves, black bears, and a variety of small mammals and songbirds.

Sensitive Wildlife Areas

The Project crosses aquatic and terrestrial habitat cores and corridors within Minnesota's Wildlife Action Network, which was formulated and detailed in Minnesota's Wildlife Action Plan 2015-2025 (MNDNR, 2016). Enbridge plans to consult with MNDNR regarding minimization of impacts to aquatic and terrestrial habitat areas within Minnesota's Wildlife Action Network.

The Project does not cross any Minnesota Audubon-designated Important Bird Areas or any state-designated WMAs.

6.10.2 Construction Impacts and Mitigation

As described in Section 6.9, construction will involve the temporary removal of vegetative cover within the construction workspace. The clearing activities will cause temporary displacement of wildlife species along the Preferred Route. The construction workspace will remain relatively clear of vegetation until the Project is completed. Some smaller and 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 Right-of-Way during construction. Displaced individuals may temporarily occupy adjacent, undisturbed areas, possibly causing increased competition with other individuals in those areas. It is expected that individual wildlife will return to their previously occupied habitats after construction has been completed 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.

As noted in Section 5.0, the Preferred Route would enable partial sharing and/or paralleling of the existing Line 3 Replacement Project Right-of-Way along the Enbridge Mainline System, as well as the co-construction with the Line 3 Replacement Project. This would minimize the time of disturbance on the Fond du Lac Band Reservation and the amount of new temporary workspace that would need to be obtained for the Project. The majority of the temporary workspace along the Preferred Route will be shared and cleared by the permitted Line 3 Replacement Project. Therefore, environmental impacts will be reduced for this Project along the Preferred Route.

Species and Habitats

Open Lands

The clearing of herbaceous and shrub communities in upland areas of the construction workspace will have a short-term impact on open habitat, but the effect will be minimized by the reestablishment of the plant species that comprise these communities. Open lands that are disturbed by construction will be seeded following the completion of pipeline construction, and it is expected that pre-existing herbaceous and shrub habitats will quickly recolonize the affected areas. It is also expected that the wildlife species that use these habitats will also return relatively soon after construction. Enbridge will employ BMPs to avoid and/or limit the

introduction or spread of noxious weeds and invasive plant species, which can degrade habitat quality (see Section 1.6 of the EPP in Appendix B and also Section 6.9).

Forested Areas

Clearing of trees in the construction workspace will have similar impacts as the clearing of other vegetation in terms of the potential for direct mortality and temporary displacement of wildlife species. Tree clearing will have longer-term impacts than the temporary removal of herbaceous and shrub species because recolonization of trees will be slower than the recolonization of other vegetation. As natural succession is allowed to proceed in these areas, it is expected that forested communities will eventually reestablish. As described in Section 6.9, however, recolonization may have some long-term effects on forested areas along the edge of the Preferred Route by triggering changes in nearby forest structure and species composition. The ability of wildlife to reoccupy the forested areas will depend on the characteristics of the reestablished forests and the specific habitat requirements of wildlife species. The overall impacts will be minimized by co-location of the Project with the existing Enbridge Mainline System.

Wetland and Riparian Areas

Construction-related wetland and waterbody impacts are discussed in Sections 6.14 and 6.15. As described above for wildlife that occupy other habitats, smaller and less mobile animals may experience direct mortality during construction activities in wetland areas, and larger and more mobile animals will disperse from the Project Right-of-Way during construction.

Similar to upland areas, clearing of herbaceous and shrub communities in wetland areas of the construction workspace will cause a short-term impact to wildlife until vegetation is reestablished. Enbridge will employ BMPs as necessary to limit the introduction or spread of noxious weeds and invasive plant species, which can degrade habitat quality.

Enbridge will minimize impacts on riparian habitats by employing BMPs as described in Section 2.5 of its EPP (Appendix B), such as maintaining vegetative buffers on each stream bank during wet trench, dam and pump, and flume stream crossing methods. The clearing of forested and brushy areas for ATWS will also be avoided as much as possible. Typically, woody vegetation in wetlands and riparian areas will not be cleared for the purpose of ATWS unless approved by appropriate regulatory agencies as stipulated in permits issued for the Project. By maintaining vegetative buffers along stream corridors, Enbridge will help reduce exposure of prey species to predators and provide shade that maintains cooler stream temperatures during construction.

6.10.3 Operations Impacts and Mitigation

Species and Habitats

Open Lands

The open lands that are affected by construction will be permanently revegetated with herbaceous species. During restoration, disturbed soils will be seeded with species determined through consultation with agencies and landowners. This active seeding program and Enbridge's implementation of other BMPs will accelerate the reestablishment of herbaceous habitat and minimize the potential for the introduction or spread of noxious weeds and invasive plant species. Taken together, these measures are expected to minimize impacts on wildlife species in herbaceous and shrub habitats during Project operations. Maintenance activities such as mowing in the new Right-of-Way and activities that require excavation may cause intermittent, temporary impacts on wildlife such as direct mortality or displacement, but these activities and potential effects will be infrequent, and in the case of mowing essential to maintain the open habitat on the Right-of-Way.

Forested Areas

After the pipeline is constructed, the new Right-of-Way for Line 4 will be maintained free of larger-diameter trees, which will result in the permanent conversion of approximately 10.6 acres of forested land associated with the construction workspace. The remaining areas of forest land temporary impacted by construction of the Project will be seeded and then allowed to regrow naturally, with the exception of the portion of the construction workspace that overlaps with the Line 3 Replacement Project maintained Right-of-Way. Over time, these areas will reestablish the forest habitat.

The Right-of-Way maintenance of approximately 10.6 acres of impacted forest land within the new Right-of-Way will result in permanent impacts on forest wildlife, as this area will be converted to non-forested habitat for the life of the Project. The nature of the impacts will depend on the characteristics of the forest land that is cleared; for example, any trees cleared within the existing, operationally maintained Enbridge Mainline System represent low-quality forest habitat because of previous clearing activities. The nature of the impacts will also depend on species-specific habitat requirements.

Enbridge's utilization and overlap with existing Rights-of-Way would reduce the total amount of forest clearing required and limit the disturbance to the edge of existing forestlands, leaving larger adjacent forest patches intact.

Wetland and Riparian Areas

Operation-related wetland and waterbody impacts are discussed in Sections 6.14 and 6.15. Because of wetland revegetation practices and measures taken to minimize impacts on riparian habitats as described above, Project operations are not expected to impact wildlife that occupy wetland and riparian areas. The Right-of-Way maintenance of approximately 13.8 acres of

impacted forest and scrub-shrub wetlands within the new Right-of-Way will result in permanent conversion of forest and scrub-shrub wetlands to non-forested emergent wetlands for the life of the Project. In addition, one of the valves will result in a conversion of 0.03 acre of scrub-shrub wetland to upland area.

Mitigation measures are outlined in Section 6.14 for the permanent conversions of forest and scrub-shrub wetlands. By maintaining vegetative buffers along stream corridors, Enbridge will help reduce exposure of prey species to predators and provide shade that maintains cooler stream temperatures during operations and maintenance activities.

6.11 Fisheries

6.11.1 Existing Environment

Species and Habitats

Representative Fish Species

As described in Section 6.15, the Project will cross three waterbodies, including one stream and two tributaries (see Table 6.15.1-2 in Section 6.15, Waterbodies). One of the three waterbodies is designated as a public water by MNDNR. The Preferred Route will not cross any Aquatic Management Area (AMA) or designated trout streams. Game fish species possibly found in waterbodies in the vicinity of the Project are listed in Table 6.11.1-1 (MNDNR, 2018d). The majority of fish in the streams crossed by the Preferred Route will be warm-water game fish, although some cold-water species, including trout, may be present in Stoney Brook, depending on the season.

Table 6.11.1-1
Game Fish Species in the Fond du Lac Band Line 4 Project Area

Warm-Water Game Fish	Cold-Water Game Fish
Bass (largemouth, smallmouth)	Brook trout
Catfish (channel)	Rainbow trout
Crappie (black)	Brown trout
Muskellunge	
Perch (yellow)	
Pike (northern)	
Sunfish (bluegill, green, hybrid, pumpkinseed)	
Walleye	

Sensitive Fisheries Areas

Designated Trout Streams

Stoney Brook is designated as a trout stream by the Fond du Lac Band.

6.11.2 Construction Impacts and Mitigation

Temporary Disturbances and Sediment Loads

As described in Section 6.15, Enbridge's intention is to execute the primary crossing method (dry crossing method) for each of the three waterbodies including the dam-and-pump and/or flume method. Both of these methods involve the installation of temporary dams upstream and downstream of the crossing area and the use of either an active (pump(s)) or passive (flume(s)) mechanism to isolate the waterbody flow and convey it across the work area without impeding normal downstream flows. If at the time of construction, the contractor, in coordination with

Fond du Lac Band and Enbridge, determines that the primary crossing method is not attainable due to site conditions, the secondary crossing method (wet crossing method) will be utilized.

The disturbances associated with installation of the pipeline, and in the case of dry crossings the dams, pumps, or flumes, across or in streams may temporarily impact movement of fish upstream and downstream of crossing sites, but this effect would be limited and of short duration. 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. Aquatic plants, woody debris, and boulders that provide in-stream fish habitat will also be removed from the construction workspace during trenching. Noise disturbances upstream and downstream of the sites will temporarily deter fish that may otherwise inhabit the area.

Sediment loads may temporarily increase downstream during open-cut wet stream crossings. These increased loads may temporarily affect the more sensitive fish eggs, fish fry, and invertebrates inhabiting the downstream area. To minimize impacts, Enbridge will complete the crossings as quickly as possible so that suspended sediment levels return to pre-construction levels in a short amount of time after the in-stream work is completed. Enbridge will also implement erosion and sediment control measures at each waterbody as necessary. Section 1.9 of the EPP (Appendix B) includes discussion of temporary erosion controls, including temporary stabilization, erosion control blankets, mulch, cat tracking, and temporary slope breakers. Additionally, Enbridge will comply with in-water work exclusion dates as necessary per MNDNR guidance.

Sensitive Fisheries Areas

Stoney Brook provides some fishing opportunities and is designated as a trout stream by the Fond du Lac Band. Enbridge will implement its EPP, which includes stream crossing mitigation measures that will minimize in-water impacts during construction. Refer to Section 6.15 and Enbridge's EPP (Appendix B) for more detailed information on waterbody crossing construction methods.

Riparian Habitats

As described in Section 6.10, Enbridge's BMPs minimize impacts on riparian habitats. These practices include minimizing clearing of forested and brush habitat along river and creek corridors, which helps provide shade that maintains cooler stream temperatures. In addition, pending landowner and environmental agency approval, Enbridge will likely replant suitable woody species in the affected riparian areas that are characteristic of the ecological zone of the waterbody crossings, and that, over time, may achieve heights of up to 15 feet.

6.11.3 Operations Impacts and Mitigation

During operations, Enbridge will maintain the new Right-of-Way by removing woody shrubs and trimming branches overhanging the Right-of-Way approximately every five years. Additional temporary impacts to woody shrubs and branches overhanging the Right-of-Way may result from maintenance activities. The changes in the light and possibly temperature characteristics at some stream crossings caused by this removal of vegetation could affect the behavioral patterns of fish, including spawning and feeding activities. However, due to the limited width of the maintained stream banks, associated effects would be highly localized and is not expected to impact the overall temperature or light conditions of the streams crossed by this Project.

6.12 Threatened, Endangered, and Sensitive Species

In December 2018, Enbridge initiated consultations with the U.S. Fish & Wildlife Service (USFWS) and MNDNR for the Fond du Lac Band Line 4 Project. In addition, due to the co-location of the Project with the Line 3 Replacement Project, the information gathered for the Line 3 Replacement Project was also used to assess potential impacts of the Fond du Lac Band Line 4 Project. Enbridge will continue to coordinate with these agencies and the Fond du Lac Band on protected species issues as warranted for the Project.

The sections below provide information for sensitive species that could occur within one mile of the Project ("the Project area") and include relevant regulations, geographic ranges, biological and habitat characteristics, primary threats, agency consultation status, and survey findings. The following groups of listed species are discussed in this section: Federally listed species, State listed species, Fond du Lac Band Tribal species of concern, and bald and golden eagles.

6.12.1 Federally Listed Species

Enbridge identified federally listed species under the federal Endangered Species Act (ESA) that could occur within the Project area by using the USFWS Information for Planning and Consultation online tool, which produces a list of species based on the Project footprint. An official list was requested through the tool and provided by the Minnesota-Wisconsin Ecological Services Field Office (USFWS, 2018a). One endangered species and three threatened species have the potential to occur in the Project area (Table 6.12.1-1). No critical habitat is located within the Project area. Further information on the species listed in Table 6.12.1-1 is provided in the sections below.

Table 6.12.1-1
Federally Listed Species that Potentially Occur within the Fond du Lac Band Line 4 Project Area

Species Name	Federal Status	State Status	Habitat
Canada Lynx (*Lynx canadensis*)	Threatened	Special Concern	Northern forest
Gray Wolf (*Canis lupus*) – Western Great Lakes Distinct Population Segment	Threatened	None	Northern forests and areas with a matrix of forest and agriculture
Northern Long-eared Bat (*Myotis septentrionalis*)	Threatened with 4(d) Rule	Special Concern	Caves and mines during hibernation; forested areas during active season
Piping Plover (*Charadrius melodus*)	Endangered	Endangered	Sandy beaches with areas of gravel and little to no vegetation

6.12.1.1 Canada Lynx

Existing Environment

The Canada lynx (*Lynx canadensis*) is a federally threatened species and a species of special concern in Minnesota.

Construction Impacts and Mitigation

Construction activities may affect Canada lynx by potentially diverting individuals from the workspace area due to noise or presence of humans and equipment involved in construction activities. Due to the extensive range of the Canada lynx and extensive habitat near the Preferred Route, disturbance is expected to be temporary and localized. Construction activities may also impact Canada lynx habitat, which in turn may affect foraging and sheltering behaviors of individual lynx. Due to the abundance of habitat near the Preferred Route, these potential impacts are expected to be localized.

Enbridge will minimize potential impacts on Canada lynx individuals and habitat through general Project-based conservation and mitigation measures. For example, Enbridge has minimized impacts on the species due to habitat loss and fragmentation by co-location of the Project with the existing Enbridge Mainline System. In addition to these general Project-based conservation and mitigation measures, Enbridge will implement the following species-specific conservation measures, as appropriate:

- Contractors and inspectors will be trained to identify and immediately report sightings of Canada lynx to USFWS.
- If a Canada lynx is sighted by Enbridge's contractor or Environmental Inspector within the construction workspace, Enbridge will cease construction activities until the individual(s) have left the area.

Operations Impacts and Mitigation

During operations, Enbridge will maintain the new Right-of-Way by removing woody shrubs and trimming branches overhanging the Right-of-Way approximately every five years. Other maintenance activities may occur as necessary. Noise and presence of humans and equipment during operations activities may divert Canada lynx from the Right-of-Way; however, any impacts will be temporary and localized. Enbridge will not remove any additional lynx habitat during operations beyond the minimal amount of new Right-of-Way that will be maintained in free of woody vegetation. Thus, no impacts on Canada lynx or their habitat are anticipated during Project operations.

6.12.1.2 Gray Wolf

Existing Environment

The Western Great Lakes Distinct Population Segment of the gray wolf (*Canus lupus*) is federally threatened; the gray wolf has no state-level special status in Minnesota. The threatened status for the gray wolf in the Western Great Lakes Distinct Population Segment was reinstated under the ESA on December 19, 2014 (USFWS, 2018b).

Construction Impacts and Mitigation

Construction activities may affect the gray wolf by potentially diverting individuals from the workspace area due to noise or presence of humans and equipment involved in construction activities. Due to the range of the gray wolf and extensive habitat near the Preferred Route, disturbance is expected to be temporary and localized. Additionally, due to the co-location of the Project with an existing Right-of-Way, temporary and permanent impacts to forested habitat that may be used by gray wolves will be minimized.

Enbridge will minimize potential impacts on gray wolves through general Project-based conservation and mitigation measures. In addition to these general Project-based conservation and mitigation measures, Enbridge will implement the following species-specific conservation measures, as appropriate:

- Contractors and inspectors will be trained to identify and immediately report sightings of gray wolves to USFWS.
- If a gray wolf is sighted by Enbridge's contractor or Environmental Inspector within the construction workspace, Enbridge will cease construction activities until the individual(s) have left the area and coordinate with the Fond du Lac Band Reservation Business Committee.

Operations Impacts and Mitigation

During operations, Enbridge will maintain the new Right-of-Way by removing woody shrubs and trimming branches overhanging the Right-of-Way approximately every five years. Other maintenance activities may occur as necessary. Noise emissions and presence of humans and equipment during operations activities may divert gray wolves from the Right-of-Way; however, any impacts will be temporary and localized. Enbridge will not remove any additional gray wolf habitat during operations. Thus, no impacts on gray wolf or their habitat are anticipated during Project operations.

The Fond du Lac Band has an ongoing wolf monitoring program on the Reservation, and Enbridge is working with Band to understand specifics for the program to ensure that the Project doesn't conflict with the plan's objectives, both during construction and operation.

6.12.1.3 Northern Long-eared Bat

Existing Environment

The northern long-eared bat (NLEB; *Myotis septentrionalis*) is listed as a state species of special concern in Minnesota. The NLEB was listed as threatened under the ESA on May 4, 2015, and the USFWS issued a 4(d) rule that became effective on February 16, 2016 (81 Federal Register 1900-1922).

Suitable NLEB habitat includes forest stands in riparian areas, forested ponds, and woodlots made up of potential roosts (i.e., snags and/or live trees ≥3 inches diameter at breast height with exfoliating bark, cracks, crevices, and/or cavities). Wooded corridors and other linear features (such as fencerows) and non-forested habitats (including emergent wetlands and adjacent edges of agricultural fields and pastures) are also used by NLEBs for foraging and hunting (USFWS, 2014). Enbridge will identify NLEB maternity roost trees prior to construction and will implement mitigation measures as needed in accordance with the NLEB 4(d) rule (USFWS, 2018c).

Construction Impacts and Mitigation

Potential impacts to NLEB may occur if clearing of forested habitat for construction workspace takes place at locations where individuals are breeding, foraging, or raising pups. Bats may be injured or killed if occupied trees are cleared during this active window. NLEB may be disturbed during clearing or construction activities due to noise or human presence.

Enbridge will minimize potential impacts on NLEB and habitat through general Project-based conservation and mitigation measures. For example, Enbridge has minimized impacts on the species due to habitat fragmentation by co-location of the Project with the existing Enbridge Mainline System. If maternity roost trees are identified, Enbridge will implement the following mitigation measures:

- Clearing of known maternity roost trees and trees within 150 feet of known maternity roost trees will not occur between June 1 and July 31; and
- No trees will be removed within 0.25 mile of a known hibernacula at any time of the year, and Project activities will not be conducted within known hibernacula (although it is acknowledged that no NLEB hibernacula currently exist within the Reservation).

Operations Impacts and Mitigation

During operations, Enbridge will maintain the new Right-of-Way by removing woody shrubs and trimming branches overhanging the Right-of-Way approximately every five years. Enbridge will not remove any additional NLEB habitat during operations. Furthermore, routine clearing will prevent woody vegetation from growing, thus preventing NLEB occupation within the maintained Right-of-Way. By preventing NLEB from occupying the Right-of-Way, the species will not be affected by operation or maintenance activities.

6.12.1.4 Piping Plover

Existing Environment

Minnesota is home to piping plovers from both the Northern Great Plains and Great Lakes populations, and the species was listed as a state endangered species in 1984 (MNDNR, 2018e). The Project is located within the area of the Great Lakes population, and the rest of this section will focus on that population of the piping plover.

Construction and Operations Impacts and Mitigation

No potentially suitable habitat for the piping plover exists within the Project footprint or the immediate surrounding area, and the species is not expected to occur within the Project area. Therefore, it is anticipated there will be no impact to the piping plover or its habitat as a result of construction or operation of the Project.

6.12.2 State Listed Species

Enbridge requested a review of the Minnesota Natural Heritage Information System (NHIS) data by the MNDNR in December 2018 and is awaiting a response to this request. Enbridge reviewed the NHIS database search results associated with the Line 3 Replacement Project from March 2015 requested by Merjent. Table 6.12.2-1 lists NHIS Element Occurrences (EO) of state-listed sensitive species within one mile on either side of the Preferred Route, including access roads and temporary workspace. Enbridge will update this information as needed based upon the results of the most recent NHIS for the Project area. Table 6.12.2-1 also lists state listed species observed during vegetation studies conducted by Enbridge in 2018 within the Fond du Lac Band Reservation.

Minnesota's Endangered Species Statute and the associated Rules impose a variety of restrictions, a permit program, and several exemptions pertaining to species designated as endangered or threatened. Species of special concern are not protected by Minnesota's Endangered Species Statute or the associated Rules. Additional information on the species in Table 6.12.2-1 is provided in the sections below.

Table 6.12.2-1
State Listed Element Occurrences in Minnesota's Natural Heritage Information System within One Mile of the Preferred Route Work Space

Species	State Status [a]	Habitat
BOTANICAL RECORDS		
Least Moonwort [b] (*Botrychium simplex*)	Special Concern	Prairies, wetlands, and interior forests
Narrow Triangle Moonwort [c] (*Botrychium lanceolatum*)	Threatened [d]	Moist, shady, mature northern hardwood forests
Pale Sedge [c] (*Carex pallescens*)	Endangered	Low, moist, grassy, and rocky habitats at the edge of fire-dependent forests where there is partial sunlight
Slender Naiad [b] (*Najas gracillima*)	Special Concern	Ponds and lakes with good water quality
Torrey's Mannagrass [c] (*Torreyochloa pallida*)	Special Concern	Wetland habitats including streams, lakes, vernal ponds, and beaver ponds
ZOOLOGICAL RECORDS		
Northern Goshawk [b] (*Accipiter gentilis*)	Special Concern	Forests

[a] The state status of all species reflects updates published by the Minnesota Department of Natural Resources on August 19, 2013 (MNDNR, 2013c)
[b] State Listed Element Occurrences in Minnesota's Natural Heritage Information System within One Mile of the Preferred Route Workspace (MNDNR, 2015)
[c] Species observed during Enbridge's 2018 vegetation surveys (Enbridge, 2018).
[d] *Botrychium lanceolatum* ssp. *angustisegmentum* is the subspecies listed in the state of MN.

6.12.2.1 Least Moonwort

Existing Environment

There are three varieties of the least moonwort (*Botrychium simplex*) in Minnesota. The species as a whole was listed as a state species of concern in 1996. No known conservation efforts have been directed towards this species in Minnesota. *B. simplex* var. *simplex* is the most common and widespread of the three and appears to be adapted to a wide variety of habitats – primarily in open sites, including prairies, wetlands, and abandoned mine sites – and occurs at various locations across the northern half of the state. *B. simplex* var. *tenebrosum* is the least common and also appears to be the most habitat-specific of the three, occurring over a much smaller range in the north central part of the state, preferring forest interiors, especially low and moist spots in mesic hardwood forests. The third variety, *B. simplex* var. *compositum*, is poorly known in Minnesota but appears to occur in the northwestern prairie counties (MNDNR, 2018f).

6.12.2.2 Narrow Triangle Moonwort

Existing Environment

The narrow triangle moonwort (*Botrychium lanceolatum* var. *angustisegmentum*) was listed as a threatened species in Minnesota in 1996. The species occurs from Minnesota, south and east to Tennessee and North Carolina, and north to Quebec, Canada. In Minnesota, the narrow triangle moonwort prefers moist, shady, mature northern hardwood forests, particularly in low areas, with a rather open understory and sparse ground cover. The species appears to be very sensitive to habitat disturbance, with threats including loss of the humus layer caused by non-native earthworms, damage caused by timber harvesting and road building, and land use changes that affect drainage (MNDNR, 2018g).

6.12.2.3 Pale Sedge

Existing Environment

The pale sedge (*Carex pallescens*) has been listed as endangered in Minnesota since 1996. It is primarily an eastern species with rare or infrequent occurrences in the Great Lakes region. The only place where pale sedge has been found in Minnesota is near the shore of Lake Superior, where only a few sites are currently known to support the plant. Minnesota populations occur on the margin of fire-dependent forests of pine (*Pinus* spp.), spruce (*Picea* spp.), aspen (*Populus* spp.), and birch (*Betula* spp.), adjacent to the lake shore. The species prefers low, moist, grassy, or rocky habitats at the edge of the forest where it receives partial sunlight, but may also occur in roadside ditches.

6.12.2.4 Slender Naiad

Existing Environment

Slender naiad (also known as the slender waternymph; *Najas gracillima*) was listed as a state species of special concern in 1996. It is a delicate plant and not usually found where exposure to significant wave action may occur. The plant is most often found rooted in sand or silt and in relatively shallow water, often less than 1 meter (3.3 feet) deep. Declining water quality appears to be the biggest threat to the species (MNDNR, 2018g).

6.12.2.5 Torrey's Mannagrass

Existing Environment

Torrey's Mannagrass (*Torreyochloa pallida*) was listed as a special concern species in Minnesota in 1996. Two varieties occur in Minnesota. *T. pallida* var. *fernaldii* is found across portions of Canada and south through the upper Great Lakes states to greater New England. *T. pallida* var. *pallida* occurs primarily in the northeastern U.S. and Canada, occurring west to Manitoba and Minnesota and south to Missouri and Georgia. The species is known to occur in swamps, marshes, bogs, margins of lakes and streams, wet hollows in woods, alder thickets, and cattail marshes, often in shallow water. As of 2008, Torrey's Mannagrass had been reported in over 100 locations. The majority of these occurrences are from the Arrowhead region of Cook, Lake, and St. Louis counties, although the species is also known to occur in Itasca, Otter Tail, and Carlton counties.

6.12.2.6 Impacts to State Listed Plant Species

Construction Impacts and Mitigation

Enbridge has been working throughout Project design to avoid construction in areas where state threatened or endangered plant species are known to occur. If state threatened or endangered plants are unavoidable, Enbridge will apply for an incidental take permit.

Operations Impacts and Mitigation

Enbridge does not anticipate any effects of Project operations on state-protected flora.

6.12.2.7 Northern Goshawk

Existing Environment

The northern goshawk (*Accipiter gentilis*) is a state species of special concern. The goshawk can be found across North America and occurs year round in northern Minnesota. The species is a large forest-dwelling hawk generally associated with mature deciduous, coniferous, or mixed forests. Nests are typically found in mature to old-growth forests consisting primarily of large trees with high canopy closure (60-90 percent). The northern goshawk breeds in northeastern and north central Minnesota, and is an irruptive migrant and winter visitor throughout the state.

Construction Impacts and Mitigation

Potential impacts to northern goshawk may occur if clearing of forested habitat for construction workspace takes place at locations where individuals are breeding or foraging. The species may be disturbed during clearing or construction activities due to noise or human presence. Due to the abundance of habitat near the Preferred Route, these potential impacts are expected to be localized. Enbridge will minimize potential impacts to the northern goshawk and habitat through general Project-based conservation and mitigation measures. For example,

Enbridge has minimized impacts on the species due to habitat fragmentation by co-location of the Project with the existing Enbridge Mainline System.

Operations Impacts and Mitigation

During operations, Enbridge will maintain the new Right-of-Way by removing woody shrubs and trimming branches overhanging the Right-of-Way approximately every five years. Enbridge will not remove any additional goshawk habitat during operations. Routine clearing will prevent woody vegetation from growing, thus preventing northern goshawk from nesting within the maintained Right-of-Way. It is possible the goshawk could nest near or immediately outside the new Right-of-Way, and the species may use the Right-of-Way for foraging. During Right-of-Way maintenance activities, the species may avoid the area due to noise or human presence but would likely utilize surrounding areas and habitats. Therefore, no impacts to northern goshawk are anticipated to result from operations activities.

6.12.3 Fond du Lac Band Tribal Species of Concern

Field surveys completed in 2018 have identified the following Fond du Lac Band Tribal species of concern occurring within the Project Right-of-Way: black ash (*Fraxinus nigra*), lowbush blueberry (*Vaccinium angustifolium*), sugar maple (*Acer saccharum*), white birch (*Betula papyrifera*), white cedar (*Thuja occidentalis*), and wild rice (*Zizania palustris*). Enbridge is currently working with the Fond du Lac Band regarding specific mitigation.

6.12.4 Bald and Golden Eagles

Existing Environment

Bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are not listed under the ESA or in Minnesota. However, the Bald and Golden Eagle Protection Act (BGEPA) protects and conserves bald and golden eagles from intentional take of an individual bird, chick, egg, or nest, including alternate and inactive nests (USFWS, 2007). BGEPA prohibits disturbance that may lead to biologically significant impacts, such as interference with feeding, sheltering, roosting, and breeding, including abandonment of a nest (USFWS, 2007). The breeding season for bald eagles in Minnesota is generally January 1 – July 31 (MDNR, 2019). The disturbance distance for active bald eagle nests in Minnesota is 0.125 mile (USFWS, 2007).

Golden eagles typically nest on cliffs but may also nest in large trees or on the ground (DeLong, 2004). Golden eagles typically do not breed within the Project area. They may winter in the Project area and may migrate through portions of the survey area in the spring and fall (Kochert et al., 2002). The Project is anticipated to have no impact on golden eagles, and the remainder of this section will focus on bald eagles.

Bald eagles may be present and nest throughout Minnesota in areas with suitable habitat (Buehler, 2000). Bald eagles commonly nest in trees but may also nest in other tall structures, such as rocky outcrops, cliffs, utility poles, and communication towers. They typically nest near bodies of water. Bald eagle breeding pairs may have more than one nest and may alternate use

of these nests from year to year. Bald eagles may roost communally during migration, winter, and summer (USFWS, 2007).

Bald eagle nest aerial surveys were conducted within 0.25 mile of the Line 3 Replacement Project Preferred Route in 2014 and 2015 in accordance with the 2014 Bald and Golden Eagle Nest Survey Protocol. Enbridge also conducted surveys in 2018. No eagle nests were identified within 0.25 mile of the Fond du Lac Band Line 4 Project during these surveys.

Construction Impacts and Mitigation

Potential impacts to bald eagles may occur if clearing of forested habitat for construction workspace takes place at locations where individuals are breeding or foraging. The species may be disturbed during clearing or construction activities due to noise or human presence. Due to the abundance of habitat in the vicinity of the Preferred Route, these potential impacts are expected to be localized. Enbridge will minimize potential impacts to the eagles and habitat through general Project-based conservation and mitigation measures. For example, Enbridge has minimized impacts on the species due to habitat fragmentation by co-location of the Project with the existing Enbridge Mainline System. Additional mitigation measures may include surveying trees for nests prior to removal.

Operations Impacts and Mitigation

During operations, Enbridge will maintain the new Right-of-Way by removing woody shrubs and trimming branches overhanging the Right-of-Way approximately every five years. Enbridge will not remove any additional eagle habitat during operations. Routine clearing will prevent woody vegetation from growing, thus preventing eagles from nesting within the maintained Right-of-Way. It is possible eagles could nest near or immediately outside the new Right-of-Way, and the species may use the Right-of-Way for foraging. During Right-of-Way maintenance activities, the species may avoid the area due to noise or human presence but would likely utilize surrounding areas and habitats. Therefore, no impacts to bald eagles are anticipated to result from operations activities.

6.13 Groundwater Resources

The primary source of water for private, public, commercial, and industrial uses near the Project is groundwater pumped from wells. Most lakes, rivers, and many wetlands near the Project are hydraulically connected with the water table and are typically a surface expression of the water table. The Project traverses glaciated terrain dominated by thick glacial drift deposits of glacial till and outwash, overlying primarily Precambrian crystalline bedrock. Although groundwater is present in both the glacial drift and underlying bedrock, the glacial drift tends to be the most widely used for water production in the vicinity of the Project due to its greater accessibility and the presence of permeable sediments.

6.13.1 Existing Environment

Aquifers

An aquifer is a geologic unit (or a combination of geologic units) that is capable of yielding usable quantities of water. Aquifers are typically composed of thick, laterally continuous deposits of permeable sand, gravel, or bedrock composed of permeable sandstone or limestone, or is highly fractured.

Glacial Aquifers

Many lakes and streams near the Project are in direct hydraulic connection with the surficial glacial aquifers and the open water of these features are typically at the same elevation as the water table. Groundwater from surficial aquifers discharges to lakes and rivers, a portion of which then evaporates into the air. Evapotranspiration from plants is also a mechanism of discharge.

Precambrian Aquifers

The Preferred Route is located over Precambrian aquifers comprised of undifferentiated granite, greenstone, and slate. These aquifers can yield limited supplies of water to rural domestic and livestock wells where fractures, faults, and weatherized zones provide porosity and permeability. Wells in these aquifers are generally completed at depths ranging from 30- to 400-feet and generally yield between one and 25 gallons per minute (Adolphson et al., 1981).

Wells

Water Supply Wells

The Minnesota County Well Index (CWI) (2018) is the most complete record of well construction and location in Minnesota and is kept up-to-date and maintained by the Minnesota Geological Survey, in cooperation with the Minnesota Department of Health (MDH). This index and the USGS National Water Information System Mapper were consulted for this analysis. A review of these resources identified one drilling record of wells within 150 feet of the Preferred Route construction workspace (Table 6.13.1-1). This well is approximately 85 feet from the proposed workspace. The CWI also identified a well within the existing Enbridge Right-

of-Way near MP 1065.6; however, the home which this well served is no longer present. Enbridge believes this well would have been sealed as part of the previous Enbridge Line 67 Project and is no longer functional. Enbridge continues to consult with affected landowners regarding known cased wells in the vicinity of the Right-of-Way. If such wells are identified, the locations of these wells will be noted. Further, the Minnesota Department of Health Administrative Rules 4725.4450 states that water-supply well must be no less than 100 feet from a pipeline. While Enbridge does not anticipate that the Project would impact the well listed in Table 6.13.1-1, all wells within 100 feet of the operational Right-of-Way would be replaced.

Table 6.13.1-1
Wells and Boreholes Identified within 200 Feet of the Fond du Lac Band Line 4 Project

Unique Well Number	County	Milepost	Distance from Construction Workspace (feet)	Direction from Construction Workspace	Use	Road Crossing Type
731993	Carlton	1067.4	85	E	Domestic	Open Cut

Public Water Supply Wells

The Project will not cross any Environmental Protection Agency (EPA)-designated sole-source aquifers or any of the Fond du Lac Band Wellhead Protection Areas. The Project will not encounter any surface water intakes for drinking water.

Contaminated Groundwater

The MPCA database was assessed to identify sites with known or potential contamination within 0.5 mile of the Project (MPCA, 2018).

Two sites with potential contamination were identified within 0.5 mile of the Project Preferred Route. Both sites were determined to be more than 500 feet from the Preferred Route centerline and therefore are not anticipated to impact or be impacted by the Project.

6.13.2 Construction Impacts and Mitigation

Construction of the Project is not expected to have long-term impacts on groundwater resources. Construction activities, such as trenching, backfilling, and dewatering, that encounter shallow surficial aquifers may result in minor short-term and localized fluctuations in groundwater levels within the aquifer. Ground disturbance associated with pipeline construction is limited to surface and very shallow ground layers and only temporary, minor impacts to groundwater are anticipated.

Construction dewatering may temporarily impact groundwater levels in proximity to the dewatering location. Dewatering techniques are detailed in the EPP (Attachment B). In addition, any applicable water appropriations and use permits required under Fond du Lac Band, federal or state law would be obtained prior to utilizing groundwater resources. Once the construction

activity is complete, the groundwater levels are expected to recover quickly to preconstruction levels. Because Enbridge does not anticipate the need for blasting, the Project is not anticipated to affect bedrock aquifers.

As discussed in Section 6.13.1, there is one water well located within 85 feet of the proposed workspace. Enbridge will confirm the exact location of this well and its proximity to the operational Right-of-Way during the civil survey. If necessary, Enbridge will work with the landowner to replace the well if it is found to be within 100 feet of the operational Right-of-Way.

No blasting is anticipated near the well, but the groundwater that supplies the well could be impacted by a spill of hazardous material. The introduction of contaminants into groundwater due to accidental release of construction related chemicals, fuels, or hydraulic fluid during construction could have an adverse effect on groundwater quality. Spill-related impacts from pipeline construction are primarily associated with fuel storage, equipment refueling, and equipment maintenance. Section 10.0 of Enbridge's EPP (Appendix B) outlines measures that will be implemented to prevent accidental releases of fuels and other hazardous substances. Sections 10.7 and 10.8 of the EPP also describe response, containment, and cleanup procedures. Enbridge's implementation of the protective measures, as set forth in the EPP, will minimize the potential for any groundwater contamination due to construction activities. Moreover, Enbridge will work with the Fond du Lac Band and the affected landowner to develop a site-specific plan to avoid any impacts on the well that is near the proposed workspace.

No known or suspected buried glacial aquifers (i.e., aquifers with artesianal properties) will be crossed by the Preferred Route. This conclusion is supported by well log data in the CWI database.

In addition, Enbridge developed a Contaminated Sites Management Plan (Appendix H), which outlines procedures if impacted soil or groundwater is encountered during pipeline construction.

6.13.3 Operations Impacts and Mitigation

Routine operations and maintenance is not expected to affect groundwater resources. During operations, potential minor short-term groundwater quality degradation is possible from maintenance equipment and vehicle spills and maintenance activities that may require excavation. Although there is potential for dewatering of shallow groundwater aquifers and potential changes in groundwater quality (such as increases in total suspended solids (TSS) concentrations) during trenching, excavation, and backfilling maintenance activities, these changes are expected to be temporary. Shallow groundwater aquifers generally recharge quickly because they are receptive to recharge from precipitation and surface water flow.

6.14 Wetlands

6.14.1 Existing Environment

The major drainage basins and watershed districts crossed by the Project are described in Section 6.15.

In Minnesota, wetland crossings are regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act. Wetland impacts associated with the Project will also be regulated by Fond du Lac Band through the Tribe's Standard Wetland Activity Permit under the Fond du Lac Band Wetlands Protection and Management Ordinance (WPMO). Since 1996, the Band has had "Treatment in the Same Manner as a State" under the federal Clean Water Act (CWA) for water quality, in addition to its inherent tribal authority to regulate water quality on the Reservation. The Fond du Lac Band has a comprehensive water quality monitoring program, which includes a water quality monitoring strategy (last updated 2012) and an EPA-approved Quality Assurance Project Plan (Fond du Lac Band RMD, 2018). The Water Quality Standards for the surface water resources of the Reservation set contaminant criteria and designating uses for 24 lakes and eight streams within the Reservation boundaries, and identify Outstanding Reservation Resource Waters. Public Waters are regulated by the MNDNR. Wetlands are also regulated by Minnesota Board of Water and Soil Resources (BWSR) and local governmental units through the Wetland Conservation Act (WCA); however, wetland impacts associated with utilities, including pipelines and associated facilities are exempt from WCA wetland replacement requirements if certain requirements are met as outlined in Minnesota statues and rules. Enbridge has initiated Project consultations with USACE, Fond du Lac, and MNDNR related to wetland and waterbody permitting and with BWSR and WCA local governmental units to confirm the Project exemption from WCA wetland replacement requirements. Enbridge will continue to coordinate with these agencies on items that arise from the initial Project consultations, as well as items that are ongoing as they pertain to the Project. Through a USEPA Direct Implementation Tribal Cooperative Agreement, the Fond du Lac Band Office of Water Protection staff obtains credentials through the USEPA to conduct wetland permit inspections on the Environmental Protection Agency's behalf.

Wetlands

Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of wetland vegetation typically adapted for life in saturated soil conditions (Cowardin et al., 1979). The following wetland types are found in the Project area:

- Palustrine emergent (PEM) wetlands consist of sedge- and rush-dominated wetlands adjacent to waterbodies, sedge meadows along existing pipeline ROWs, and shallow marsh communities dominated by cattails and reed canary grass. Emergent wetlands can also include widely scattered small, ephemeral pools that support a variety of emergent hydrophytes.

- Palustrine scrub-shrub (PSS) wetlands are primarily comprised of shrub-carr communities, with a mix of other hydrophytic species common to emergent wetlands.
- Palustrine forested (PFO) are wetlands dominated by a forest plant community. PFO wetlands comprise several distinct communities, including floodplain forest, hardwood swamp, coniferous swamp, and coniferous bog.
- Palustrine unconsolidated bottom (PUB) are wetlands and deepwater habitats with a vegetative cover less than 30 percent.

Enbridge will acquire the necessary wetland permits for the Project from local, state, federal, and Fond du Lac Band agencies, as needed. As part of the permitting requirements for USACE, and Fond du Lac Band, Enbridge will avoid and minimize impacts on wetlands to the extent possible, restore temporary impacts to wetlands on-site, and provide compensatory mitigation as required by permits.

Wetland Delineations

Enbridge conducted wetland delineation surveys along approximately 91 percent of the Preferred Route to identify the wetlands that will be affected during Project construction. The majority of the numbers represents information gathered from field surveys in this section. Wetlands were identified and mapped in general accordance with the Northcentral and Northeast Regional Supplements of the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987). Enbridge will conduct wetland delineations along the remaining nine percent of the Preferred Route when it is granted permission for survey access.

Along the nine percent of the route where Enbridge was unable to obtain field-verified survey data, Enbridge used NWI data in digital format obtained from MNDNR to identify potential wetlands (MNDNR, 2013a). Through a combination of NWI and 2018 field data, Enbridge determined that the Preferred Route will cross a total of 37 wetlands (based on feature IDs) with a combined wetland crossing length of approximately 6.16 linear miles. Summaries of the wetland types crossed, the total length of each crossing, and the areas affected by construction and operations are presented in the sections below.

The Project does not cross wetlands (Public Water Wetlands) or basins (Public Water Basins) listed on the MNDNR Public Waters Inventory (MNDNR, 2013b), nor does it cross any Outstanding Resource Value Waters (ORVW) designated by the MNDNR.

6.14.2 Construction Impacts and Mitigation

Based on review of field data collected through 2018, supplemented by NWI data where field data were not available, Enbridge has determined that approximately 6.16 linear miles of wetlands will be crossed by the Project. Construction across wetlands for the pipeline will result in wetland impacts totaling approximately 96.5 acres (including construction impacts and access roads). Enbridge reduced the construction workspace width within unsaturated wetlands to 115 feet, and within saturated wetlands to 135 feet to minimize impacts.

Table 6.14.2-1 summarizes the construction impacts breakdown by wetland type along the Project. Construction impacts are divided into the following categories: Planned disturbance associated with Enbridge's authorized Line 3 Replacement Project and areas of new disturbance associated with the Project. Impacts are calculated based on the construction area proposed at the time of this filing. Appendix G provides a breakdown by wetland type.

Table 6.14.2-1
Temporary Construction Impacts of the Fond du Lac Band Line 4 Project

Wetland Type	Area of Planned Disturbance for Line 3R (acres) [a]	Area of New Proposed Disturbance (acres)[b]	Project Total (acres)
PEM	41.1	3.9	45.0
PFO	16.6	8.1	24.7
PSS	20.2	3.6	23.8
PUB	2.0	0.4	2.4
Total	***79.9***	***16.0***	***95.9***

Note: PEM – Palustrine Emergent; PSS – Palustrine Scrub-Shrub; PFO – Palustrine Forested; PUB – Palustrine Unconsolidated Bottom
Totals may not add due to rounding.
[a] Areas planned to be disturbed for Enbridge's Line 3 Replacement Project. Includes temporary construction workspace and new Right-of-Way.
[b] New Disturbance for the Fond du Lac Band Line 4 Project. Includes temporary construction workspace and new Right-of-Way.

Construction will result in temporary impacts and, in a few situations, minor changes in plant species composition. The temporary impacts include: loss of wetland vegetation and wildlife habitat as a result of clearing and other construction activities; soil disturbance associated with clearing, trenching, and equipment traffic; and increases in turbidity and alterations of hydrology as the result of trenching, dewatering, and soil stockpiling activities. Further, invasive species were observed within some saturated wetlands within the Right-of-Way. Enbridge would follow procedures outlined in the EPP (Appendix B) to prevent the spread of invasive species, to the extent possible, within the construction corridor.

Approximately 45.0 acres of PEM wetland and 2.4 acres of PUB wetland will be temporarily affected by construction of the proposed Project. Of those acres, 3.9 acres of PEM wetland and 0.4 acre of PUB wetland will be newly disturbed as part of the Project. Enbridge anticipates that there will be no long-term impacts on emergent wetlands. The wetlands will be restored to preconstruction conditions, and the herbaceous vegetation will be allowed to vegetate naturally in these areas, which Enbridge anticipates will occur quickly.

Approximately 23.8 acres of PSS wetland and 24.7 acres of PFO wetland will be affected by construction of the Project. Of those acres, 3.6 acres of PSS wetland and 8.1 acres of PFO wetland will be newly disturbed as part of the Project. Approximately 10.1 acres of PEM and 0.7 acre of PUB will be located within the proposed Line 4 new Right-of-Way and will be temporarily impacted as the wetlands will be restored back to preconstruction conditions. Approximately 7.7 acres of PFO and 6.1 acres of PSS will also be located within the proposed Line 4 new Right-of-Way and will be permanently impacted as a result. This is further described in the Operations Impacts and Mitigation section below. The temporary impacts on scrub-shrub wetlands and forested wetlands will be of a longer duration than emergent wetlands because the woody vegetation will require a longer time to reestablish on the temporary construction workspace after restoration.

Typical 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. Construction activities will be minimized in wetlands and/or special construction techniques will be used to minimize the disturbance to vegetation and soils and to maintain wetland hydrology. Where a wetland cannot support construction equipment, construction activities will be accomplished from timber construction mats or by the use of low ground pressure equipment, thus limiting disturbance to the wetland. A typical construction schematic illustrating a wetland crossing is provided in Section 4.0. Posting of signage noting environmental features such as wetlands during construction is described in Section 6.15.

Enbridge's reduction of the temporary construction workspace by 5 to 25 feet will minimize impacts on wetlands and saturated wetlands. Additionally, Enbridge's co-location of the pipeline with the authorized Line 3 Replacement Project will limit the amount of new disturbance in unaffected wetland areas.

Enbridge will also minimize impacts on wetlands by implementing the mitigation measures specified in USACE permits and the Fond du Lac Band WPMO, including the purchase of wetland mitigation credits or other agreed upon compensatory mitigation. Wetlands crossing general requirements are included in Section 3.0 of the EPP (Appendix B).

USACE and BWSR have designated ten Wetland Bank Service Areas (BSAs) throughout the state. The Project crosses BSAs 1 and 6 (see Figure 6.14.2-1 and Table 6.14.2-2). Fond du Lac Band will require the Project to establish compensatory wetland mitigation as per § 310 of the WPMO. The WPMO requires compensatory wetland mitigation be pursued and rejected on-Reservation, for both permanent and temporary wetland impacts, before off-Reservation wetland banking can be pursued. Enbridge is working with the Fond du Lac Resource Management Division to develop appropriate compensatory wetland mitigation for the Project.

Table 6.14.2-2
Wetland Bank Service Areas Crossed by the Fond du Lac Band Line 4 Project

Bank Service Area	Major Watershed Name	Major Watershed Number	Crossing Length (miles)
1	St. Louis River	3	8.3
6	St. Croix River	35	1.7
		PROJECT TOTAL	**10.0**

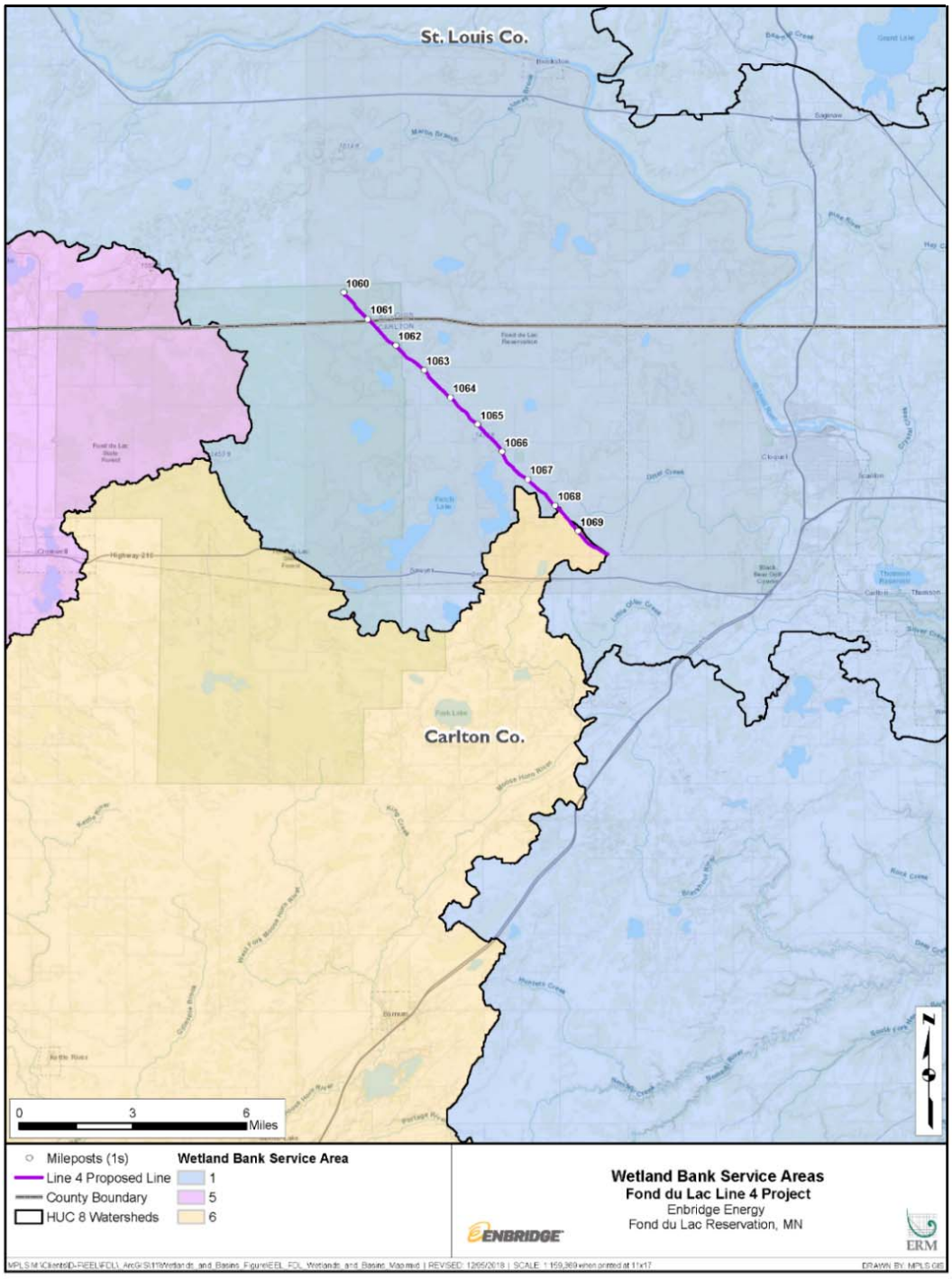

Figure 6.14.2-1 Wetland Bank Service Areas

Access Roads

Enbridge conducts the same level of environmental survey for access roads that require improvement as it does for the construction workspace. It does this to avoid and minimize access road impacts on sensitive resources, including wetlands. A majority of access roads that will be utilized for the Project are existing roads, which will require some widening. Impacts on wetlands will be temporary and will be limited to the extent possible during construction. Access road construction impacts to wetlands are depicted in Table 6.14.2-3. Any proposed access roads that included wetland crossings were reviewed to determine if these wetlands could be avoided, and if unavoidable, what could be done to minimize the impacts on these areas.

Table 6.14.2-3
Access Road Construction Impacts of the Fond du Lac Band Line 4 Project

Access Road/Wetland Type	Total Area (acres)
PEM	0.4
PFO	0.0
PSS	0.2
PUB	0.0
Total	**0.6**

Notes: PEM – Palustrine Emergent; PSS – Palustrine Scrub-Shrub; PFO – Palustrine Forested; PUB - Palustrine Unconsolidated Bottom Wetlands

Clearing and Grading

Vegetation within wetlands will be cut off at the ground level, leaving existing root systems intact to preserve natural sources of rootstock and to facilitate revegetation of the native wetland species after construction. Stumps will only be removed over the trench line and where necessary for safe operation of equipment. Trees, shrubs, and stumps that are removed will be disposed of properly outside wetlands. Temporary erosion control measures and, where necessary, timber mats will be installed to minimize impacts to wetlands during construction.

Trenching and Installation

Typically, the pipeline trench will be excavated in wetlands using a backhoe excavator. In unsaturated wetlands, up to 12 inches of topsoil will be stripped from the trench line and stockpiled separately from trench spoil.

If the soils in the wetland area are stable and capable of supporting equipment with or without timber construction mats, the pipe will be strung, welded, and lowered into the trench as in upland areas. When water is present in the trench, the trench may be temporarily dewatered and/or concrete and/or bag weights may be employed (e.g., set on the pipeline) to provide negative buoyancy and prevent movement of the pipeline once it is buried.

It may not be feasible to use the construction methods described above for crossing large wetlands with standing water and saturated soils. In these wetlands, topsoil segregation is often infeasible and the pipe cannot be strung and welded up within the wetland. In these instances the trench will be dug by a backhoe working across the wetland on timber mats, and the pipe will be assembled in an upland area and floated across the wetland using the "push-pull" and/or "float" techniques. When the pipeline is in position, the floats (if used) will be removed, and the pipeline will settle into the trench.

After the pipe has been installed, the trench will be backfilled and the original contours will be restored to the extent practicable. In areas where the topsoil has been segregated, the topsoil will be restored after the trench is backfilling to facilitate the natural revegetation process. Any excess backfill material will be removed to an upland area.

Cleanup and Revegetation

Cleanup and rough grading of wetlands will begin as soon as practical after the trench is backfilled and topsoil is restored. Enbridge will restore wetland crossings in accordance with permit conditions. The goal of cleanup and rough grading is to restore wetland hydrology and soils and avoid permanent impacts. Enbridge will restore affected wetland to pre-construction elevations and remove any timber mats that may have been used. Disturbed wetland areas will then be revegetated in accordance with the EPP (Section 7.0 in Appendix B), unless standing water is prevalent or as otherwise directed by landowners or regulatory agencies. No fertilizer, lime, or mulch will be applied in wetlands.

6.14.3 Operations Impacts and Mitigation

After the pipeline is constructed, the new Right-of-Way for Line 4 will be maintained free of larger-diameter trees and will limit the reestablishment of the scrub-shrub wetlands and forested wetlands. Therefore, based on the Right-of-Way widths and overlap with other existing and authorized corridors, Enbridge has determined that the Project will result in the permanent impacts of approximately 7.7 acres of forested wetland and 6.1 acres of scrub-shrub wetland as these wetland types will be converted to emergent wetland (see Table 6.14.3-1). Approximately 0.03 acre of PSS wetland will be permanent impacts converted to upland area to accommodate the valve installation at MP 1062 (see Table 6.14.3-1). Additional temporary impacts to wetlands may result from maintenance activities that require excavation.

Table 6.14.3-1 summarizes the permanent wetland conversion type (PFO and PSS) within the Project.

Table 6.14.3-1
Permanent Wetland Conversion Impacts of the Fond du Lac Band Line 4 Project

Wetland Type	Wetland Impact (Type Conversion) – Proposed New Line 4 Operational ROW (acres) [a]	Permanent Wetland Fill (acres)[b]
PEM	0.0	0
PSS	6.1	0.03
PFO	7.7	0
PUB	0.0	0
Total	***13.8***	***0.03***

Note: PEM – Palustrine Emergent; PSS – Palustrine Scrub-Shrub; PFO – Palustrine Forested; PUB – Palustrine Unconsolidated Bottom
Totals may not add due to rounding.

[a] Proposed operational new Right-of-Way to be maintained as Enbridge's proposed Fond du Lac Band Line 4 Project. PSS and PFO wetland type will be converted to emergent wetland within the proposed Line 4 ROW.

[b] Permanent wetland fill associated with the valve installation at MP 1062.

Planned future removal of the existing segment of Line 4 in Fond du Lac Band Reservation will provide enhanced access to Fond du Lac Band lands by removing the above-ground pipe. The Project will allow water to move naturally across the Enbridge Mainline Corridor and restore the wetland hydrology to allow for the long-term restoration of the temporary impacted PEM, PFO, and PSS wetlands.

6.15 Waterbodies

6.15.1 Existing Environment

Surface waters crossed by the Preferred Route are located within the St. Louis River and St. Croix Watersheds (USGS, 2013) (Figure 6.15.1-1). Table 6.15.1-1 summarizes the watersheds crossed by the Project (USGS, 2013). Enbridge reviewed information on the Minnesota Board of Water & Soil Resources website to identify any potential Watershed Districts crossed by the Project. No watershed districts will be crossed by the Project (Minnesota Board of Water & Soil Resources, 2019).

Table 6.15.1-1
Major Watersheds Crossed by the Fond du Lac Band Line 4 Project

Major Watershed Name	Major Watershed ID Number	Crossing Length (miles)
St. Louis River	3 (HUC 040102)	8.3
St. Croix	35 (HUC 070300)	1.7
	PROJECT TOTAL	**10.0**

Waterbody Crossings

Enbridge conducted waterbody field surveys in 2018 to identify the locations and characteristics of the waterbodies (i.e., lakes, streams, rivers, and drainage ditches) crossed by the Preferred Route. By the end of the 2018 field season, 91 percent of the route was accessible and surveyed. The remaining nine percent will be surveyed upon being granted survey access. Based on a review of hydrographic spatial data, there do not appear to be any waterbodies in the parcels yet-to-be surveyed. Upon completion of the waterbody field surveys, Enbridge will evaluate any additional resources surveyed and conduct agency consultations, as appropriate.

The pipeline will cross three waterbodies. Waterbodies crossed by the Project are detailed in Table 6.15.1-2.

Table 6.15.1-2
Waterbody Crossings – Fond du Lac Band Line 4 Project

Waterbody Name (Feature ID)	Approximate Milepost	Flow Regime	State Status [a]	Federal Status [b]	Primary Crossing Type	Secondary Crossing Type
Stoney Brook (s-49n18w6-aa)	1062.5	Perennial	PWI	N/A	Dry Crossing	Wet Open Cut
Unnamed Tributary to Stoney Brook (w-49n18w17-x)	1064.2	Perennial	N/A	N/A	Dry Crossing	Wet Open Cut
Unnamed Ditch (s-49n18w17-aa)	1064.8	Perennial	N/A	N/A	Dry Crossing	Wet Open Cut

[a] MNDNR (2018h); Designated a Trout Stream, per Minnesota Rules 6264.0050, Subp. 4
[b] USACE (2018)

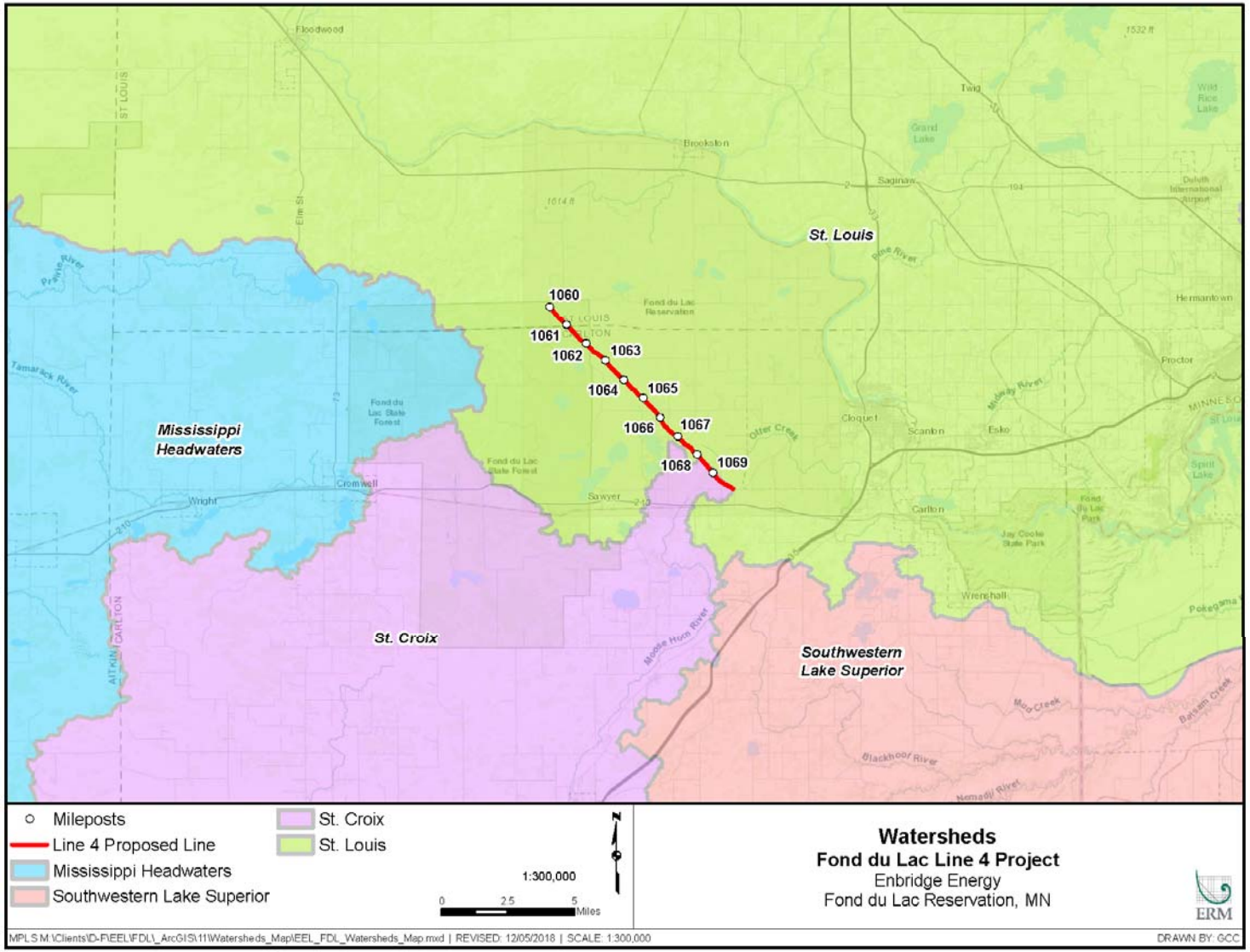

Figure 6.15.1-1 Watersheds

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Special Designated and Sensitive Waterbodies

The Project will cross one watercourse, Stoney Brook, listed on the MNDNR Public Water Inventory (PWI) (MNDNR, 2018h). This watercourse is regulated as a public water under the MNDNR's Public Waters Permit Program. Enbridge will prepare and submit an application to MNDNR to obtain a License to Cross Public Waters permit for this public water crossing.

No waterbodies crossed by the Project are considered navigable waters, as defined under Section 10 of the Rivers and Harbors Act of 1899 (USACE, 2018). The Project will not cross any waterbodies meeting ORVW criteria. The Project will not cross any river segments that are listed on the National Rivers Inventory (NRI) as designated or potentially designated National Wild and Scenic Rivers. The Project will not cross any river segments that are listed as state-designated canoe and boating routes (MNDNR, 2018i).

Wild rice, known to the Anishinaabeg as manoomin, is a culturally significant plant harvested by the Fond du Lac Band. Hand-harvested wild rice is a traditional staple food of the Band that provides irreplaceable cultural and nutritional benefits. Links to land and food are important components of culture and health to the Ojibwe people; within the Anishinaabe worldview, the health of wild rice and the health of the people are inseparable (Fond du Lac Band of Lake Superior (LFDL), 2004; Fond du Lac Band of Lake Superior Chippewa Health Impact Assessment (Fond du Lac Band HIA), 2019). Additionally, the physical activity associated with traditional food gathering, combined with the high nutritional value may offer great benefits to decreasing risks of chronic disease (LFDL, 2004; Fond du Lac Band HIA, 2019). Within the Reservation boundaries, there are five primary wild rice producing waterbodies. These include Perch Lake, Mud Lake, Rice Portage Lake, Jaskari Lake, and Deadfish Lake. These lakes are not located within the Project area and are not expected to be impacted by the Project. Additional discussion regarding wild rice resources is included in Section 6.16.

Water Quality

The Fond du Lac Band Environmental Program developed, and the Reservation Business Committee (RBC) adopted, a set of Water Quality Standards for the surface water resources of the Reservation, setting contaminant criteria and designating uses for 24 lakes and eight streams within the boundaries, and identifying Outstanding Reservation Resource Waters. As discussed in Section 6.14.1, the Band has Treatment-in-the-Same-Manner-As-a State under the CWA and inherent tribal regulatory authority. As a critical tool for implementing these standards, the Fond du Lac Band has a comprehensive water quality monitoring program, which includes a water quality monitoring strategy (last updated 2012) and an EPA-approved Quality Assurance Project Plan (Fond du Lac Band RMD, 2018).

Enbridge consulted the final USEPA 2016 and draft 2018 303(d) impaired waters lists to identify impaired waterbodies potentially crossed by the Project. The Project does not cross any rivers or streams listed on the USEPA's 303(d) list. Enbridge reviewed the waterbodies crossed by the

Project against the October 26, 2018 MNDNR Designation of Infested Waters (MNDNR, 2014). No waterbodies crossed by the Project were included on the Infested Waters list.

6.15.2 Construction Impacts and Mitigation

Enbridge's routing analysis and proposed construction procedures minimize wetland and surface water impacts to the maximum extent practicable. All in-stream work activities required for pipeline installation would be minimized to the extent practicable. In-stream trenching would be conducted during periods permitted by the appropriate regulatory agencies and applicable permits. Stream crossings would be designed as close to perpendicular to the axis of the stream channel as engineering and routing constraints allow, creating the shortest crossing length.

Direct temporary impacts to surface waters crossed by pipeline segments and indirect temporary impacts to downstream surface waters may occur during the construction period due to soil erosion resulting from vegetation clearing, trenching, and other construction-related activities. Potential impacts on waterbodies will be minimized along the Preferred Route by implementing BMPs described in Enbridge's EPP (Appendix B). Stream banks will be protected from erosion through the use of temporary and permanent soil stabilization techniques. Examples of erosion control techniques include placement of erosion control blankets, mulch, straw bales, bio-logs, silt fence, and prompt seeding following construction activities. Stream banks will be restored to pre-construction grades when practicable and revegetated with appropriate vegetation. Placement of rock rip-rap, geotextile fabric, and other bioengineering techniques may be implemented to stabilize sites inherently unstable.

Waterbody Crossings

The following subsections describe the waterbody crossing methods for each of the three waterbodies. It is Enbridge's intention to execute the primary crossing method for each of the three waterbodies. If at the time of construction, the contractor, in coordination with Fond du Lac Band and Enbridge, determines that the primary crossing method is not attainable due to site conditions, the secondary crossing method will be utilized.

Enbridge will first clear the existing vegetation at the three waterbodies from the construction workspace as necessary to prepare for excavation. A minimum 20-foot buffer of undisturbed non-woody vegetation will be maintained on the stream banks until the trenching begins at the stream crossing. Woody vegetation within this buffer, if present, will be cut and removed during initial clearing of the Right-of-Way.

Once the woody vegetation has been removed from the stream banks, Enbridge will install temporary bridges across the streams to allow the passage of equipment along the construction workspace. Construction equipment, with the exception of clearing/bridge installation equipment, will be required to use the bridge to cross over the waterbody. Equipment bridges will be designed to pass the maximum foreseeable flow of the stream and will be maintained to prevent flow restriction while the bridge is in place. Bridges will be

cleaned as necessary to minimize the potential for loose soil that has fallen off passing equipment from entering the stream. A list of bridge types is described in Section 2.4.1 of the EPP (Appendix B).

Grading will be completed on each side of the waterbody, as necessary, to establish a safe, level working area for construction personnel and equipment and to accommodate limitation on pipe bending. Any grading that is necessary will be directed away from the waterbody to reduce the potential for material to enter the waterbody. Prior to grading, the appropriate soil erosion and sediment control measures such as silt fence and/or staked straw bale structures will be installed for spoil containment and to minimize the potential for sediment to migrate into the waterbody as discussed in Section 1.9 of the EPP (Appendix B). Further, any additional temporary workspaces that are needed for the waterbody crossings will be set typically 50 feet back from the water's edge if topographic and other site conditions permit.

Primary Crossing Methods

After initial clearing and grading is complete, the pipeline will be installed across the three waterbodies using one of the two primary dry crossing methods: dam-and-pump or flume method, as discussed in Section 2.5 of the EPP (Appendix B). These methods are described below. Enbridge will comply with the in-water work exclusion dates specific to MNDNR's Northeast and Northwest Regions.

Dam-and-Pump Method

The dam-and-pump method (see Section 2.5.2 of the EPP in Appendix B) is a dry crossing method used for sensitive streams with low gradients and flow, or sensitive streams with meandering channels. Prior to in-stream excavation, stream flow will be diverted by means of a dam-and-pump system. This method isolates the construction work area from the stream flow. Temporary dams are installed, generally consisting of sandbags, plastic sheeting, and/or steel bulkheads, across the waterbody upstream and downstream of the crossing prior to excavation. Stream flow is actively pumped around the in-stream construction work area to maintain downstream flow. The discharge point downstream will have additional soil erosion and sedimentation control measures to reduce any potential stream channel scouring (e.g. filter bag or dewatering structure). The dam and pump system will remain in place until the pipeline is installed, the ditch is backfilled, and the banks are restored. The temporary dams will then be removed and natural stream flow restored to the channel.

Flume Method

The flume method (see Section 2.5.3 of the EPP in Appendix B) is a dry crossing method used for sensitive, relatively narrow waterbodies free of large rocks and bedrock at the trench line and that have a relatively straight channel across the construction workspace. The flume method is generally not appropriate for wide, deep, or heavily flowing streams. Similar to the dam-and-pump method, stream flow is isolated from the construction work area by diverting the natural flow into a flume or multiple flume pipes extending across the work area. These

flumes remain in place throughout the in-stream construction process and until the pipe is installed, backfilled, and the banks have been restored.

Secondary Crossing Method

Open Cut Wet Trench Method

This method is a secondary crossing type for the three waterbodies and will be used to cross the waterbodies were flumed or dam and pumped methods is not attainable due to site conditions. The open-cut wet trench method (see Section 2.5.1 of the EPP in Appendix B) is a waterbody crossing technique that often minimizes total duration of in-stream disturbance. This method will involve excavating the trench through the waterbody or ditch using draglines or backhoes operating from the stream banks.

Waterbody Restoration

After the pipeline is installed, the streambed will be restored and the banks will be reconstructed and stabilized with erosion control materials. Temporary erosion control measures will be re-installed if they were removed during the pipe installation, and will be maintained until permanent erosion control measures are installed and effective. Permanent slope breakers will also be installed, where needed, across the full width of the Right-of-Way during final cleanup. After installation and while the pipe section is being tied-in into the pipeline, should trench dewatering be necessary during the tie-in process, the water will be pumped into a filtration device located in a well-vegetated area and in a manner to prevent the migration of heavily silt-laden water into waterbodies or wetlands as identified in Section 5.0 of the EPP (Appendix B).

Stream banks disturbed during construction will be restored as near as practicable to pre-construction conditions unless the slope is determined to be unstable. As necessary, erosion control blankets (curlex, jute, or equivalent) will be placed on slopes over 30 percent or that are a continuous slope to a sensitive resource area (e.g., wetland or waterway) to ensure revegetation and slope stabilization (to preconstruction conditions) in these sensitive areas. Mitigation measures such as bioengineering, rock riprap, or reshaping the banks may be utilized to prevent slumping. Enbridge will work closely with MNDNR, USACE, and the Fond du Lac Band Tribe to identify waterbodies where bioengineering practices could be used as a method of bank stabilization. Rock riprap may be used in areas where other stabilization methods are not effective. Enbridge recognizes that site-specific coordination and approval with the Fond du Lac Band will be necessary in the event riprap is required to achieve bank stabilization.

Once the banks have been stabilized, the erosion control devices (ECDs) will be reinstalled. Temporary slope breakers may be installed on sloped approaches to streams in accordance with the spacing requirements specified in Section 1.9.5 of the EPP (Appendix B). A temporary seed mix approved by the landowner and the Fond du Lac Band, and mulch and/or erosion control blankets will be installed within a 50-foot buffer on either side of the stream. Silt fence

or functional equivalent as approved in advance by Enbridge will be installed upslope of the temporary seeding area (Section 2.5.1 of the EPP in Appendix B).

Where necessary for access, the travel lane portion of the construction workspace and the temporary bridge will remain in place until final cleanup activities are completed. These temporary bridges and travel lanes will be removed when they are no longer needed, at which time the areas disturbed by these bridges and lanes will be restored, seeded and mulched as specified in the EPP (Appendix B). The temporary erosion control measures will be removed after vegetation has been re-established.

Special Designation and Sensitive Waterbodies

Enbridge will post signs for environmental features such as wetlands, waterbodies, drainages/drain tiles, buffer zones, rare plant or ecological community sites, invasive species and noxious weed locations, regulated wildlife habitat, cultural resources, and erosion-prone or steep slopes.

Public Water Watercourses

The Stoney Brook crossing has been identified as a sensitive crossing and is listed by the MNDNR as a Public Watercourse. Enbridge will not conduct instream work within this brook between April 1 and June 30 without written approval from MNDNR. Enbridge will prepare a site-specific plan for this crossing and will continue to work with MNDNR to permit proposed and alternate crossing methods at the public waterbody.

Water Quality

It is anticipated that any impacts to water quality from construction of the Project will be temporary. The following measures from the EPP (Appendix B) addresses water quality issues.

- Section 1.9 requires installation of temporary ECDs at the edge of the construction workspace to slow water leaving the site and prevent siltation of waterbodies and wetlands downslope. It also requires riparian buffers to be maintained to provide an additional barrier to prevent sedimentation.
- Section 10.0 addresses planning, prevention, and control measures to minimize the potential for and consequences of spills of fuels, petroleum products, or other regulated substances as a result of construction. Sections 10.9.1 and 10.10 states that if a spill should occur during refueling operations, operations shall stop until the spill can be controlled and the situation corrected.
- Section 10.6.3 requires that the storage of petroleum products, refueling, maintenance, and lubricating operations take place in upland areas that are more than 100 feet from wetlands, streams, and waterbodies (including drainage ditches), and water supply wells.

- Section 10.6.5 prohibits the discharge of concrete wash water, grindings, and slurry to wetlands, waterbodies, or storm sewer systems, or the drainage of any of these materials onto adjacent properties.

Enbridge will implement BMPs described in Enbridge's EPP (Appendix B) to maintain existing designated water uses and prevent the degradation of water quality in accordance with the Fond du Lac's water quality standards.

Hydrostatic Testing

Enbridge will hydrostatically test the new pipe to verify its integrity prior to placing the pipeline in service. Enbridge plans on utilizing water from Big Lake (near MP 1066) as a source for appropriating hydrostatic test water. Enbridge will obtain the applicable water appropriation and discharge permits for hydrostatic testing activities.

Water used for hydrostatic testing will be discharged on land or returned to the waterbody from which it was appropriated, in accordance with EPA's National Pollutant Discharge Elimination System (NPDES) permit requirements for the Project and Fund du Lac water quality standards. If the water is discharged to an upland area, energy dissipation devices (e.g., straw bale structures) and controlled discharge rates will minimize the potential for erosion and subsequent release of sediment into nearby surface waters and wetlands. If hydrostatic test water is discharged directly into waterbodies, energy dissipation devices (e.g., splash pups) and controlled discharge rates will be used to prevent stream bottom scour. Enbridge will develop a site-specific discharge plan for each waterbody that will receive hydrostatic test discharges. At this time, Enbridge does not anticipate the use of test water additives, and no chemicals will be used to dry the pipeline following the hydrostatic testing.

Enbridge will comply with all requirements of the individual NPDES hydrostatic test discharge permits issued for the Project, including working with the Fond du Lac Band regarding the type and location of any required discharge structures. Further, Enbridge will work with the Fond du Lac Band regarding water appropriations to ensure that impacts to historical and culturally important springs are avoided and minimized. Additional details regarding hydrostatic test discharges are included in Environment Hydrotest Discharge Authorization & Documentation located in Appendix D of the EPP (Appendix B). In addition, new procedures are in place to measure discharge flows. The total volume of water discharged and the discharge rate will be verified with a flow meter (or equivalent), or as required by the individual NPDES permit. The total volume of water discharged and the discharge rate will not exceed that specified in the individual NPDES permit (refer to Section 5.2.5 of the EPP).

Enbridge intends to use the MNDNR's General Permit 1997-0005 for water appropriations over 10,000 gallons per day. Per guidance from MNDNR, Enbridge will select an appropriation site (or sites if needed) that will meet MNDNR's criteria of "doing no harm." All appropriation sites will be reviewed by MNDNR prior to issuance of a Water Appropriations Permit. The MNDNR General Permit further states that water withdrawals must have a minimal potential for

impacts on groundwater resources and must not adversely impact trout streams, calcareous fens, or other significant environmental resources. Enbridge may request withdrawal from impaired waters if use of the water will not impact the impairment for which the waterbody is listed. In the event that Enbridge must use water from a surface water source that is designated as infested, Enbridge will apply for an Infested Waters Diversion or Transportation Permit and will comply with all requirements of that permit.

6.15.3 Operations Impacts and Mitigation

Impacts on water quality due to operations and maintenance activities are expected to be temporary (e.g., excavation, mowing), minimal, and site-specific. Disturbed areas at crossings will be restored and stabilized as soon as practical after pipeline installation. Impacts could result from alteration of stream banks and maintenance clearing of woody vegetation as needed, approximately every five years within the Right-of-Way.

6.16 Cultural Resources

6.16.1 State Regulations, Policies, and Executive Orders

Minnesota state policy is to engage in formal government-to-government tribal consultation on Projects that affect Minnesota tribes and their lands, as provided in Executive Order 13-10.

Under Minnesota Rules Chapter 7852.1900, subpart 3(C), Project analysis the Commission must consider impacts to archaeological sites "lands of historical, archaeological, and cultural significance," which includes tribal resources on public lands and the protection of human remains and burials. The State Historic Preservation Office (SHPO) consults with applicants, as well as tribal, state, and federal government agencies, to identify historic properties and ways to avoid or reduce adverse effects on those properties, and this includes tribal historic and cultural properties. Applicable laws include, but may not be limited to, Minnesota Statutes sections 138.31-138.42; the Private Cemeteries Act (Minnesota Statutes 307.08); and others.

6.16.2 Federal Regulations, Policies, and Executive Orders Relating to Historic Properties and Tribal Consultation

Federal executive orders, policies, and memoranda also provide for consultation by the federal government with American Indian tribes, along with some components of federal legislation. Some of the federal regulations also allow for the preservation and management of cultural resources, largely pertaining to those that are archaeological or historic in nature. Among these are Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (November 6, 2000); Presidential Memorandum (November 5, 2009); Executive Order 13007, Indian Sacred Sites; Presidential Memorandum Government-to-Government Relations with Native American Governments (April 29, 1994); National Historic Preservation Act of 1966 (NHPA); Archaeological and Historic Preservation Act of 1974; American Indian Religious Freedom Act of 1978; Native American Graves Protection and Repatriation Act of 1990 (NAGPRA); Antiquities Act of 1906; Historic Sites Act of 1935; and Archaeological Resources Protection Act of 1979, among others.

Certain, tribal consultation required under state and federal law can only take place upon the submission of the final Tribal Cultural Resources survey (discussed below). Because the survey has been conducted by the Fond du Lac Band, however, and will meet all Tribal Historic Preservation Office (THPO) requirements, and due to the Band's support for the Project, it is anticipated that consultation will be completed in accordance with the planned construction schedule.

6.16.3 Archaeological and Tribal Cultural Resource Surveys

Enbridge has completed a traditional, archeological historic properties review for the Line 3 Replacement Project, which includes an evaluation of what also encompasses the Line 4 corridor across the Reservation. However, the standard interpretation of the archeological

record usually does not recognize sites of cultural, religious, and historic significance to Indian tribes and is insufficient to meet all federal legal requirements.

Cultural resources consist of archaeological resources (e.g., sites and isolated finds), historic resources (e.g., objects, buildings, structures, or districts), and sacred places (including traditional cultural properties (TCPs), as defined by NHPA and related regulations, and landscapes). Cultural resources may also include tribal, usufructuary rights resources both within reservation boundaries and ceded lands by treaty (e.g., traditional hunting and fishing areas) and treaty areas. For the purposes of this discussion, these resources are referred to collectively as cultural resources. Cultural resources are finite and non-renewable; once destroyed they and the information they provide are lost. Federal laws and regulations provide standards for cultural resources identification, evaluation, and mitigation of impacts.

The NHPA requires tribal consultation and evaluation of TCPs as part of required, Section 106 review, in addition to other types of historic properties review, for on-reservation projects, and state law likewise requires review of project impacts on these and other types of certain types of cultural resources historic properties. Federal guidance and best practice dictate that tribal historic properties review be led by tribes, and that has guided the review here. The Fond du Lac Band has assumed Section 106 responsibilities on the Reservation and has established a THPO. Enbridge has worked with the THPO to design and conduct comprehensive tribal historic properties review intended to comply with Section 106 and other federal requirements. The Band, as Enbridge's fiscal agent under Section 106 and contractor, has led a tribal historic properties assessment on the Reservation (as part of a larger assessment along the entire Line 3 corridor). Federal tribal consultation, fieldwork, interviews, literature review, mapping, avoidance, and mitigation planning are nearing completion. The Band will issue a final, comprehensive written Tribal Cultural Resources report for the Reservation Right-of-Way before any construction begins, with appropriate protections to preserve confidentiality.

Enbridge and the Fond du Lac Band have agreed upon procedures for conducting all aspects of the TCR Survey, as well as for handling unanticipated discoveries on the Reservation. Enbridge will continue to consult on these matters throughout every phase of the Project.

Additionally, the Fond du Lac Band has competed field work, interviews, and literature review for the TCR Survey. There is one possible historic feature adjacent to the proposed route that continues to be under evaluation, which can only be completed after snow cover is out and with the participation of the BIA. Enbridge has committed to full avoidance if the feature is determined to be a historic property. Therefore, the Fond du Lac Band has informed Enbridge that the preliminary conclusion is that no TCPs or other historic sites will be impacted by the Project.

6.16.4 Natural Resources as Cultural Resources; Manoomin

Enbridge understands that, for American Indian tribes, cultural resources have evolved in concert with natural resources, such that one is dependent on the other. In this manner, and that no distinction is present between what is considered a cultural resource and a natural resource (Stults et. al. 2016). Therefore, a natural resource is also one of cultural and spiritual value. Traditional American Indian cultural belief considers all elements of an ecosystem to be interconnected and that certain species of wildlife and plants are relatives and spiritual messengers. Based on the sovereign, inherent right to self-determination, tribes collectively oversee sacred responsibilities to the land, waters, and people.

Wild rice, known to the Anishinaabeg as manoomin, is a culturally significant plant harvested by the Fond du Lac Band (and other tribes in parts of the United States and Canada). Hand-harvested wild rice is a traditional staple food of the Band that provides irreplaceable cultural and nutritional benefits. Links to land and food are important components of culture and health to the Ojibwe people; within the Anishinaabe worldview, the health of wild rice and the health of the people are inseparable (Fond du Lac Band Health Impact Assessment, Fond du Lac Band HIA, 2019). Additionally, the physical activity associated with traditional food gathering, combined with the high nutritional value may offer great benefits to decreasing risks of chronic disease (Fond du Lac Band HIA, 2019). For these reasons, wild rice waters, medicinal plant sites, and other natural resources will be included in the Fond du Lac Band BIA Right-of-Way Survey (and wild-rice producing waters near the Right-of-Way are further discussed in Section 6.15).

6.16.5 Unanticipated Discoveries

Enbridge has also developed an Unanticipated Discoveries Plan (Appendix F) for use during all Project construction activities. The Unanticipated Discoveries Plan prescribes actions to be taken in the event that previously unrecorded archaeological or historic site or human remains are discovered during construction activities, which sets forth the guidelines to be used in the event archaeological resources (including both prehistoric and historical resources) or human skeletal remains are discovered during construction activities. If any cultural resources are identified within the construction corridor possible archaeological and cultural materials or suspected human skeletal remains are identified during ground disturbing activities within the construction corridor, Enbridge would work with THPO representatives and any other applicable authorities to establish a mitigation strategy for pipeline construction and operation. Moreover, there will be Tribal Monitors, approved and trained by the Band, present during construction to ensure no sites are disturbed.

6.17 Air Quality

6.17.1 Existing Environment

The counties in which the Project will be constructed and operated are all designated as in attainment or unclassifiable for the National Ambient Air Quality Standards for all criteria pollutants, which were developed by the EPA to protect human health and the environment. The criteria pollutants include carbon monoxide (CO), lead (Pb), nitrogen oxides (NO_X), ozone (O_3), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), particulate matter less than 10 microns in diameter (PM_{10}), and sulfur dioxide (SO_2). Criteria pollutant emissions from pipeline systems are predominantly limited to volatile organic compounds (VOC) from transferring crude oil to and from storage tanks and fugitive VOC emissions from piping components (such as valves, flanges, and pump seals). VOC is a precursor of ozone, which is one of the criteria pollutants. The Project will relocate a segment of the existing Line 4 pipeline that connects to the existing Clearbrook Terminal. No operational changes are proposed to the Clearbook Terminal associated with the Project; therefore, the Project will result in no operational emission changes.

6.17.2 Construction Impacts and Mitigation

Construction of the Project is not expected to have a substantial impact on air quality. Construction of the pipeline and associated facilities could result in intermittent and short-term fugitive emissions. These emissions would include dust from soil disruption and combustion emissions from the construction equipment. The amount of fugitive dust emissions would depend on the moisture content and texture of the soils that are disturbed. Generally, however, emissions from construction are not expected to cause or significantly contribute to a violation of any applicable ambient air quality standard because the construction equipment would be operated on an as-needed basis, primarily during daylight hours. Emissions from the gasoline and diesel engines would be minimized because the engines must be built to meet the standards for mobile sources established by the EPA mobile source emission regulations (Title 40 C.F.R. Part 85).

Enbridge will minimize dust generated from construction activities. The contractor will take reasonable steps to control dust near residential areas and other areas as directed by Enbridge. Control practices may include wetting soils on the Right-of-Way, limiting working hours in residential areas, and/or additional measures as appropriate based on site-specific conditions such as high wind events. The use of these dust suppression techniques will minimize fugitive dust emissions during construction, and minimize potential air quality impacts on nearby residential and commercial areas.

In addition to combustion emissions and fugitive dust, the Project's disturbance of wetlands during construction has the potential to temporarily release greenhouse gasses (GHG), in the form of carbon dioxide (CO_2) to the atmosphere. Peatlands (i.e., bogs, fens, and marshes) represent the single largest terrestrial carbon stock in the state of Minnesota. Undisturbed

peatland areas contain large, thick deposits of organic materials that have accumulated over long periods of time in saturated conditions where decomposition is minimal. Drainage and disturbance of these wetland areas introduces the accumulated organic material to oxygen resulting in comparatively rapid decomposition and a rapid release of CO_2 to the atmosphere. Enbridge's restoration of the wetlands following construction has the potential to sequester carbon from the atmosphere. This sequestration process would occur much more slowly than the carbon release associated with wetland disturbance but may ultimately result in total carbon accumulation that is comparable to an undisturbed wetland of a similar type. Peatlands in Minnesota have been accumulating carbon for on the order of 5,000 years, and peatlands can continue to accrue carbon for millennia. Because carbon accumulation in wetlands occurs gradually and over long periods of time, a restored wetland must be preserved over very long timescales to offset carbon released due to disturbance.

Based on the carbon cycle in wetlands and the potential impacts of the Project, construction activities will result in temporary carbon cycle impacts ranging from possible decreases in wetland carbon sequestration or partial loss of accumulated carbon to total loss of accumulated wetland carbon. Different wetland types will experience different levels of carbon release during construction and re-sequestration after restoration. It would be very difficult to predict with any certainty what the release or re-sequestering values will be.

6.17.3 Operations Impacts and Mitigation

Emissions of criteria pollutants at the Clearbrook Terminal will continue to be regulated under an air emissions permit. Emissions will not increase at the facility because there is no increase in throughput as a result of the Project. Indirect criteria and GHG emissions will be generated as a result of using purchased electricity to run the pumps at Enbridge's existing Line 4 pump stations, which may require some modification as part of the Project but will not increase GHG emissions.

Minnesota GHG Reduction Goals

The operation of crude oil pipelines generates very little direct GHG emissions. Direct GHG emissions may be generated from trace amounts of methane contained in the crude oil as it is transferred through tankage at the terminals. Indirect GHG emissions will be generated by utility companies that provide electricity to Enbridge. Enbridge uses electricity to operate electric pumps that transport the crude oil through the pipeline. These pumps are located at pump stations along the pipeline at locations that are determined by a variety of factors including engineering design, terrain, power availability, and delivery needs.

Enbridge understands that Minnesota has GHG reduction goals as set out in Minnesota Statutes, Section 216H.02. Enbridge's pipelines are currently designed to operate efficiently, which minimizes demand for electricity (and as a result minimizes indirect GHG emissions). Because operation of the pipeline does not directly produce significant amounts of GHG emissions,

operating the pipeline in the most efficient manner possible is the best way that Enbridge can help meet Minnesota's GHG reduction goals.

6.18 Permit Table

Table 6.18-1 lists the government agencies or authorities, title of each permit or certificate, anticipated application and decision dates, and status of the permit or certificate Enbridge must file for the Fond du Lac Band Line 4 Project.

Table 6.18-1
Preliminary List of Government Authorities and Titles of Permits/Approvals
(Fond du Lac Band Line 4 Project)

Name of Agency	Title of Permit/ Approval	Date of Application [a]	Date of Decision	Status
United States Army Corps of Engineers – St. Paul District and Minnesota Pollution Control Agency	Section 404 Regional General Permit	January 2018	Pending	Pending submittal
United States Fish and Wildlife Service	Section 7 Endangered Species Act Consultation (Federal endangered species)	December 2018	Pending	Initial consultation in December 2018. Further consultation pending
Bureau of Indian Affairs	Grant of Right-of-Way	February 2019	Pending	Initial consultation meeting October 2018. Pending submittal.
United States Environmental Protection Agency	Hydrostatic Test Water Discharge Permit	February 2019	Pending	Pending submittal
Fond du Lac Band	Standard Wetland Activity Permit	January 2019	Pending	Initial consultation meeting October 2018. Pending submittal.
	Land Use Permit	February 2019	Pending	Initial consultation meeting October 2018. Pending submittal.
	401 Water Quality Certification	January 2019	Pending	Initial consultation meeting October 2018. Pending submittal.
	Threatened and Endangered Species Consultation	October 2018	Pending	Initial consultation meeting October 2018. Pending submittal.

Table 6.18-1
Preliminary List of Government Authorities and Titles of Permits/Approvals
(Fond du Lac Band Line 4 Project)

Name of Agency	Title of Permit/ Approval	Date of Application [a]	Date of Decision	Status
Fond du Lac Band	Timber Removal Permit	February 2019	Pending	Initial consultation meeting October 2018. Pending submittal.
	Right-of-Way Ordinance Consent	December 2018	February 2019	Complete
Minnesota Public Utilities Commission	Pipeline Routing Permit	February 2019	Pending	Pending submittal
Minnesota Department of Natural Resources	License to Cross Public Waters	February 2019	Pending	Initial consultation in December 2018. Pending submittal
	License to Cross Public Lands	February 2019	Pending	Initial consultation in December 2018. Pending submittal
	Water Appropriation General Permit (hydrostatic test water and trench dewatering)	February 2019	Pending	Pending submittal
	State Endangered Species Consultation	December 2018	Pending	Initial consultation in December 2018.
Tribal Historic Preservation Office	Cultural Resources Consultation, NHPA Section 106 Clearance	October 2018	Pending	Initial consultation in October 2018. Further consultation pending
Minnesota Department of Transportation	Road Crossing Permits	April 2019	Pending	Pending Submittal
Carlton County	Wetland Conservation Act Utility Exemption	February 2019	Pending	Pending Submittal
St. Louis County	Wetland Conservation Act Utility Exemption	February 2019	Pending	Initial consultation in December 2018. Further consultation pending

[a] Actual date of initial consultation/anticipated dates for submission.

7.0 Removal of Existing Line 4

After the Project goes into service, the existing Line 4 segment will be removed from the Fond du Lac Band Reservation after it has been disconnected and deactivated and upon approvals from appropriate permitting authorities such as the MNDNR, USACE, and the Fond du Lac Band. The process by which the pipeline segment will be permanently taken out of service is designed to adhere to the applicable environmental rules and regulations, and to ensure the protection of the public, the environment, current land use, and adjacent Enbridge pipelines.

Fond du Lac Band has raised concerns that the above-grade Fond du Lac Band Line 4 segment creates a barrier to the natural water flow across the Reservation and, in some areas, impedes land access for the Band members. Planned future removal of the existing segment of Line 4 in Fond du Lac Band Reservation will provide enhanced access to Fond du Lac Band lands by removing the aboveground pipe. The Project will allow water to move naturally across the Enbridge Mainline Corridor, provide better land accessibility for the Fond du Lac Band Community, and improve the usability of this area for traditional purposes. The Project will also better protect Line 4 against third party damage.

7.1 Project Timing

Planned future removal of the existing Line 4 pipe will occur after installation of the Project. Timing depends on the receipt of required regulatory approvals and permits.

In addition, existing Line 3 and existing Line 4 lie adjacent to one another. To reduce risk of damaging an operating Line 3 pipeline, removal of Line 4 is planned to occur after Line 3 is relocated to the outside of the Enbridge Mainline Corridor and existing Line 3 is deactivated.

7.2 Pipeline Removal Process

Removing the segment of existing Line 4 that will be relocated may include the following activities:

- Purging: The existing segment of Line 4 will be purged of all oil.
- One call: Enbridge contacts the Gopher One Call system to locate where all of the third party utilities exist within the areas where work will be completed.
- Locate and 4 way sweeps: A 4 way sweep is when Enbridge locates its own pipelines and verifies the locations of any third party utilities as previously marked via the Gopher One Call system. This is done using electronic pipe locators to find, trace, and map underground.
- Visual indicators, such as lathe or flags, will be installed and monitored to ensure the safety of existing utilities.
- Potholing: Is an excavation method, typically done using a hydrovac truck, which creates a test hole to expose underground infrastructure to determine the horizontal and

vertical location of the facility. Per Enbridge's ground disturbance standards, visual confirmation of adjacent and crossed utilities (including other Enbridge pipelines) will be completed by way of exposing the pipeline in spot areas to confirm alignment.

- Rght-of-way access: Access roads will be developed to accommodate equipment travel and delivery and removal trips of materials, equipment, and pipe.
- Timber mat placement: the removal of a pipeline within a multi-pipe corridor necessitates the placement of timber mats over the active pipelines to ensure safe distribution of weight created by heavy construction equipment. Construction equipment then uses these mats as a working and travelling surface when excavating and removing the deactivated pipe.
- Installation of environmental protection equipment listed in Enbridge's Environmental Protection Plan (i.e., silt fence) (Appendix B).
- Dewatering structures/equipment are installed and utilized to abate the risk of soil instability to directly adjacent lines caused by water intrusion/events.
- Sheet piling: Installation of sheet piling may be required in areas where pipelines are in close proximity to other infrastructure or where there are slope stability concerns due to differences in either ground elevation, wet soils, saturated wetlands, or depth of cover.
- Inspections of existing utilities will be continuous throughout this process to ensure soil is stable throughout removal activities and to ensure there is no unplanned movement of the utility causing unsafe stresses.
- Topsoiling: Topsoil will be stripped and stockpiled. Topsoil will be removed, and subsequently stockpiled onsite, from areas above the to-be-removed pipeline and where heavy truck/equipment travel is predicted. Topsoil will be stored adjacent to the trench, or in designated areas nearby if conditions do not allow for local storage.
- Excavation: Soil around the pipeline, referred to as "ditch spoil," will be removed and stockpiled to accommodate safe access to the pipe for subsequent steps. Ditch spoil will be stored adjacent to the trench, or in designated areas nearby if conditions do not allow for local storage.
- Removal of existing set-on weights: where set-on weights are present, bolt-on weights will be unbolted, lifted from trench, and removed from site.
- First cutting of existing pipe: The pipe will be cut into long sections, inclusive of cuts around existing valves, and at crossings.
- Staging of existing pipe and valves: Long sections of pipe and valves will be lifted out of the trench and placed upon matting.

- Second cutting of pipe: Long sections will be further cut into shorter sections to accommodate lengths short enough to transfer and stack upon removal truck trailers.
- Removal of pipe and valves: Staged pipe and valves will be loaded onto trucks and removed from site.
- Pipe removal at crossings: Pending approval from the crossing authority, pipe will be removed via open cut, which was originally how the Line 4 pipe was installed. Each crossing removal will need to be engineered to ensure public safety and environmental protection. Where open cut is not possible or permitted by the crossing authority, the pipe will remain in place.
- Hauling of replacement fill: Fill will be hauled onsite and placed in the trench to fill in the space left when the pipe is removed. The trench width for the removal of the 48-inch pipe will be approximately 6 feet wide at the bottom of the trench and 12-15 feet wide at the top of the trench.
- Sheet piling removal: Sheet pile will be removed and hauled offsite.
- Trench backfill/grading: Trench will be backfilled and graded by using stockpiled trench spoil.
- Mat removal: Construction matting will be removed.
- Topsoil replacement/grading: Areas where topsoil was previously stripped will have stockpiled topsoil replaced and graded.
- Initial/final restoration and clean-up: Depending upon seasonality/conditions, site will be fully restored with appropriate seeding or will be stabilized until which time conditions allow for final restoration.

7.3 Continued Maintenance of the Right-of-Way

The existing Line 4 segment that will be removed is mostly located in the center of the Enbridge Mainline Corridor within the Fond du Lac Band Reservation. Therefore, where removal occurs and pipelines continue to operate within the existing easement and adjacent to and on both sides of the removal location, the removed Line 4 segment land will continue to be maintained within the Enbridge Mainline Corridor.

Fond du Lac Band and Enbridge have also agreed to complete additional maintenance activities within the Enbridge Mainline Corridor Right-of-Way through the Fond du Lac Band Reservation once the Line 4 Project is complete. This work will include lowering portions of Line 1, among other efforts. Line 1 lowering work will be done pursuant to the exemption in Minnesota Rule 7852.0300 and additional environmental and tribal approvals will be obtained as required.

These Projects will allow the Fond du Lac Band to meet important restoration goals on the Reservation. For example, at least three large formerly forested wetlands have been affected by altered hydrology as a direct result of the Line 4 above-ground exposures. In these areas, water on one side of the pipeline has been ponded for decades, causing the trees to die over time. This ponding has occurred off the Right-of-Way to affect 10s to 100s of acres of once-coniferous swamp or bog. In attempt to restore these areas to former forested wetland, the following steps will be undertaken by the Fond du Lac Band:

- Once the old Line 4 is removed, a period of hydrology "draw down" would begin, which in some cases, may take several years.
- At least in one location, a stream would have to be restored for proper draw down to be successful.
- At least in one location, a series of beaver dams would have to be removed for proper draw down to be successful.
- Once hydrology has stabilized at each restoration location, tree planting can begin, which would also take several years at some locations.
- Monitoring of the restorations would also be part of the Project.

The Fond du Lac Band has also identified several other stream channel reconnects/improvements that could be accomplished as part of Enbridge's access roads.

In summary, and as stated in Section 2.0 above, the purpose of this Project is to meet the Fond du Lac Band's concerns over current Line 4 on the Reservation. The Project will meet four important goals: (1) protection of Line 4 from third-party damage; (2) restoration of wetlands and other remediation; (3) improved land accessibility and access for timber management; and (4) elimination of exposed pipe segments. The Fond du Lac Band believes that the Project will benefit its Community by meeting each of these goals; Enbridge agrees.

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