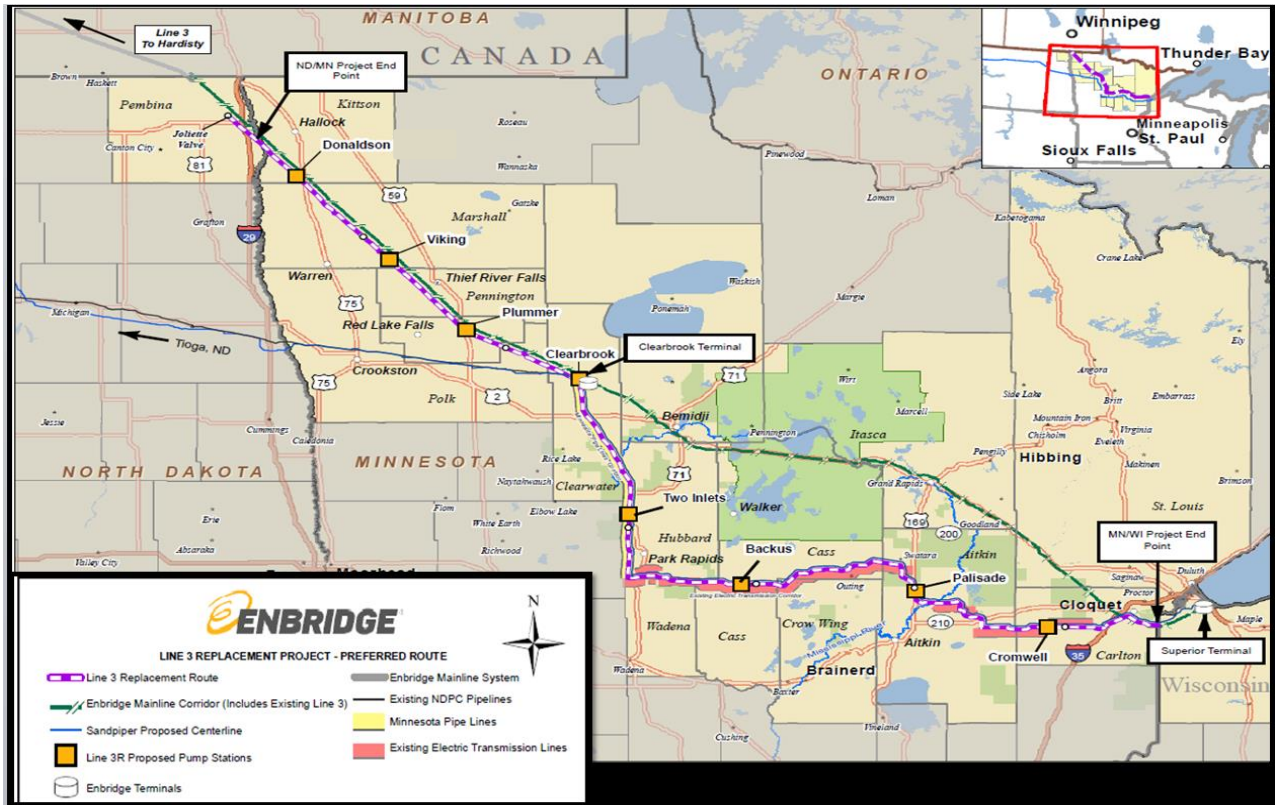
# 4.0 PROJECT DESCRIPTION

## 4.1 General Location

The existing Line 3 originates in Canada and crosses the U.S./Canada border near Neche, North Dakota. It continues through North Dakota to Clearbrook Terminal near Clearbrook, Minnesota and terminates at the Enbridge Superior Terminal near Superior, Wisconsin.

The Applicant proposes the Project to generally follow the existing Line 3 pipeline along the Enbridge Mainline System right-of-way from the North Dakota/Minnesota border in Kittson County to and including the Clearbrook Terminal in Clearwater County (referred to as the "west of Clearbrook" portion of the route). Next, the Project turns south from Clearbrook to generally follow an existing third-party pipeline right-of-way to Hubbard County and then turns east to generally follow other existing electric transmission lines to the Minnesota/Wisconsin border in Carlton County (referred to as the "east of Clearbrook" portion of the route). An overview map of the Project's proposed route is shown in Figure 4.1-1 below, and a more detailed discussion of the route selection process for this Project is described in Section 6 of this Application.

**Figure 4.1-1: Project Overview Map**



The proposed pipeline route traverses the counties of Kittson, Marshall, Pennington, Polk, Red Lake, Clearwater, Hubbard, Wadena, Cass, Crow Wing, Aitkin, and Carlton. (See Appendices B.2 and B.3 to view county maps and detailed route maps of the Project's Preferred Route.)

## 4.2 Proposed Replacement Pipeline

Enbridge proposes to replace its existing Line 3 with 337 miles of new 36-inch diameter pipeline in the route illustrated in Figure 4.1-1 above. Details regarding design specifications of the pipeline and associated facilities are provided below.

### 4.2.1 Pipeline Design Specifications

Table 4.2.1-1 summarizes the design parameters of the pipe required for the Project, which may be modified as the final detailed design engineering is completed.

The determination of an appropriate pipeline wall thickness is governed by design criteria in the Code of Federal Regulations which incorporate numerous safety factors. A minimum wall thickness requirement for pressure containment is calculated for the entire mainline to satisfy the desired MOP, thereby ensuring the mainline system can withstand normal operating pressure at designed wall thickness. In addition, short lengths of heavier-wall pipe will be utilized at railways, roads, and water crossings. The wall thickness, which will vary between .600-inch and .750-inch, and lengths of these sections will be determined on a site-specific basis during detailed engineering for the finale route. The increased wall thickness designed at these crossings is primarily implemented to account for the additional stress caused by exterior loads and additional stress encountered during installation.

| Table 4.2.1-1<br>Line 3 Replacement Project Pipe Specifications | |
|---|---|
| **Explanation** | **Specification** |
| Pipe Size (Diameter) | 36-inch outside diameter (NPS 36) |
| Pipe Type (Grade) | X70 carbon steel pipe manufactured according to American Petroleum Institute (API) Specifications 5L PS2 |
| Pipe Wall Thickness | |
| Nominal | 0.515 inch |
| Road Bore | 0.600 inch |
| Cased Railroad | 0.600 inch |
| Uncased Railroad | 0.750 inch |
| Horizontal Directional Drill (HDD) | 0.750 inch |
| Estimated Length | 337 miles |
| Pipe Design Factor | 0.72 |
| Longitudinal Seam Factor | 1.00 |
| Class Location and Requirements | Not applicable (applies to natural gas pipelines) |
| Coating, mainline | 14 mils Epoxy Bonding |
| Coating, trenchless | 40 mils Epoxy Bonding ABR |
| Specified Minimum Yield Strength (psi) | 70,000 psi |
| Tensile Strength (psi) | 82,000 psi |

### 4.2.2 Operating Pressure

The operating pressure of the Project will be up to 1,440 pounds per square inch gauge (psig) at the station discharge as shown in Table 4.3.2-1 below. The maximum operating pressure of the Project will be 1,440 psig.

## 4.3 Associated Facilities

### 4.3.1 Pump Stations and Locations

Existing Pump Stations and their locations on the existing Line 3

As shown on Table 4.3.1-1 below, the existing Line 3 is currently connected to seven existing pump stations in Minnesota.

**Table 4.3.1-1**
**Existing Line 3 Minnesota Pump Stations**

| Facility Name | Acreage | County | Approximate Milepost | Type |
|---|---|---|---|---|
| **West of Clearbrook along Enbridge Mainline System** | | | | |
| Donaldson | 7.4 | Kittson | 814.11 | Pump Station |
| Viking | 13.1 | Marshall | 848.15 | Pump Station |
| Plummer | 8.4 | Red Lake | 877.05 | Pump Station |
| Clearbrook | 62 | Clearwater | 909.43 | Terminal Connectivity, Pump Station, and PIG Receiver/Launcher, and injection from existing tanks 61, 62, 63 and 64 |
| **East of Clearbrook along Enbridge Mainline System** | | | | |
| Cass Lake | 7.3 | Cass | 953.02 | Pump Station |
| Deer River | 12.5 | Itasca | 996.03 | Pump Station |
| Floodwood | 5.3 | St Louis | 1044.36 | Pump Station |

Project Pump Stations and their locations

The Project will require the installation of eight pump stations in Minnesota, as identified on Table 4.3.1-2 below. Enbridge is enclosing hereto as Appendix C, a station plot plan for each of the pump stations proposed in this Application. For the four pump stations west of Clearbrook, Enbridge plans to expand and build adjacent to its existing Donaldson, Viking, Plummer and Clearbrook pump station sites. The remaining four pump stations east of Clearbrook will be greenfield pump station sites. Enbridge has been working diligently with the affected landowners, and has acquired land in fee or options to purchase such land in fee for each of the station sites. Enbridge plans to exercise such options once it obtains regulatory approval to proceed with the Project.

**Table 4.3.1-2**
**Line 3 Replacement Project Minnesota Pump Stations**

| Facility Name | Approximate Acreage Acquired | County | Approximate Milepost | Type | Station Plot Plan |
|---|---|---|---|---|---|
| **West of Clearbrook*** | | | | | |
| Donaldson | 13 | Kittson | 25.1-W | Pump Station | Appendix C.1 |
| Viking | 10 | Marshall | 59.4-W | Pump Station | Appendix C.2 |
| Plummer | 13 | Red Lake | 88.3-W | Pump Station | Appendix C.3 |
| Clearbrook | 98 | Clearwater | 121.5-W | Terminal Connectivity, Pump Station, and PIG Receiver/Launcher, and injection from existing tanks 61, 62, 63 and 64 | Appendix C.4 |
| **East of Clearbrook**** | | | | | |
| Two Inlets | 10 | Hubbard | 45.6-E | Pump Station | Appendix C.5 |
| Backus | 10 | Cass | 96.1-E | Pump Station, PIG Receiver/Launcher | Appendix C.6 |
| Palisade | 10 | Aitkin | 150.8-E | Pump Station | Appendix C.7 |
| Cromwell | 37 | Carlton | 195.5-E | Pump Station | Appendix C.8 |

*Land acquired in fee or optioned for the expansion of existing pump station sites.
**Land acquired in fee or optioned for new greenfield pump station sites.

Enbridge selected the location of the new pump stations based on its hydraulic studies to achieve optimum pipeline performance. Enbridge also considered and evaluated other location factors that are important in minimizing impacts to the environment and human settlement. Some of the factors considered include, but are not limited to, the following:

- Avoiding sensitive areas, such as state forests;
- Avoiding wetlands and/or minimizing wetland impacts where possible;
- Minimizing tree clearing;
- Avoiding close proximity to residential areas and communities;
- Ensuring reasonably level grade (good drainage);
- Ensuring that the site spacing provides sufficient clearances to allow effective operation and maintenance of all components;
- Ensuring reasonable highway access with minimal upgrading of municipal roads;
- Ensuring reasonable access to suitable power and utilities;
- Ability to locate on the correct side of the mainline corridor to prevent pipe cross-overs for station suction and discharge lines; and
- Landowner willingness to sell property.

### 4.3.2 Pump Station Specifications

Table 4.3.2-1 below provides specifications for each of the Project's eight pump stations.

**Table 4.3.2-1**
**Line 3 Replacement Project Pump Station Specifications**

| Station | # of Units | Inlet Diameter (Inches) | Pump Maximum Operating Pressure* (psig) | Annual Average Capacity (kbpd) | Maximum Power Capacity of Motors (hp) |
|---|---|---|---|---|---|
| Donaldson | 3 | 24 | 1,440 | 760 | 7000 |
| Viking | 2 | 24 | 1,440 | 760 | 7000 |
| Plummer | 2 | 24 | 1,440 | 760 | 7000 |
| Clearbrook | 4 | 24 | 1,440 | 760 | 7000 |
| Two Inlets | 3 | 24 | 1,440 | 760 | 7000 |
| Backus | 3 | 24 | 1,440 | 760 | 7000 |
| Palisade | 3 | 24 | 1,440 | 760 | 7000 |
| Cromwell | 3 | 24 | 1,440 | 760 | 7000 |

* Pump Maximum Operating Pressure is based on design temperature of 56.5° C.

## 4.4 Above-Ground Facilities

### 4.4.1 Valve Placement

Enbridge conducted an Intelligent Valve Placement (IVP) analysis for the Project's Preferred Route to ensure that the proposed valve placement complies with federal law and the operational needs of the Enbridge Mainline System. Based on the preliminary engineering design studies, 27 mainline valves will be installed in Minnesota. Valves will be installed near

major rivers, other environmentally sensitive areas, population centers, and pump stations, and are discussed in more detail in Sections 7.5, 7.8, 7.12, and 7.14 of this Application.

The valves to be installed will be 36-inch American National Standards Institute (ANSI) 600 weld end by weld end, full port, rising stem gate valves. These valves will be manufactured in accordance with API Standard 6D "API Specification for Steel, Gate, Plug, Ball and Check Valves for Pipeline Service." Table 4.4.1-1 below summarizes the current design parameters of the valves, which may be modified during detailed design engineering.

**Table 4.4.1-1**
**Valve Design Parameters**

| Design Parameter | Specification |
|---|---|
| Diameter | 36-inch outside diameter (NPS 36) |
| American National Standards Institute Rating | ANSI Class 600 |
| Maximum Operating Pressure | 1440 psig |

### 4.4.2 Launcher and Receive Traps

Enbridge plans to install launcher and receiver traps at sites near Clearbrook and Backus as depicted on the station plot plans in Appendix C.4 (Clearbrook) and Appendix C.6 (Backus).

### 4.4.3 Other Third-Party Ancillary Facilities

New electrical transmission lines will be needed to serve the new pump stations east of Clearbrook. Enbridge is currently working with the electrical transmission provider to determine the facilities required to meet the needs of the Project.

## 4.5 General Design and Operational Specifications

Existing Line 3

As previously noted in Section 2 of this Application, Line 3 is currently operating under voluntary pressure restrictions, and has an average annual capacity of 390 kbpd. However, once this Project is completed, Line 3 will be fully replaced from the U.S./Canadian border near Neche, North Dakota to Superior, Wisconsin. The full replacement enables Enbridge to restore Line 3's historical operating capabilities.[1]

[1] See Section 1.4 of this Application for more detailed information on the history of Line 3.

Proposed Line 3

The Project will be designed and constructed in accordance with federal pipeline safety regulations, specifically 49 C.F.R. Parts 194 and 195 and any applicable national technical standards, including ASME B31.4.

As previously noted, the Project will be constructed with 36-inch diameter pipe including the installation of eight pump stations in order to achieve its annual transportation capacity of 760 kbpd. Liquid pipelines are generally designed at a specified capacity for a known liquid. The change in fluid characteristics (e.g., density and viscosity) of the transported liquids will affect the capacity of the pipeline. Liquids are also batched, meaning that different liquids, or grades of crude oil, are shipped at different times, generally in a repeatable sequence. Both the fluid characteristics and batch sequence will affect the capacity of the pipeline.

Two definitions are used to describe pipeline capacity: Design Capacity and Annual Capacity.

**Design Capacity**: The capacity of the pipeline and pumping facilities, at its current or proposed design state for given types of liquids and their batch sequence. Design capacity is calculated assuming ideal operating conditions. Design capacity for the Project is 844 kbpd.

**Annual Capacity**: The average sustainable pipeline throughput over a year. Annual capacity is calculated assuming historic average annual operating conditions. These operating conditions include scheduled and unscheduled maintenance, normal operating issues, and crude supply availability. Annual capacity of a pipeline is typically 90 percent of design capacity, and represents the capacity requested in this Application. Annual Average Capacity for the Project is 760 kbpd.

Pursuant to the applicable requirements, Enbridge is providing for the Commission's information the ultimate design capacity for the pipeline considering its diameter, wall thickness, steel grade, and crude (slate irrespective of the number of pump stations proposed), which is 1,016 kbpd. The figure in turn yields an annual average capacity of 915 kbpd. Further engineering design studies would be required to determine the number of pump stations needed to achieve the ultimate design capacity levels, but that is not the level sought in this Application.

### 4.5.1 Product Capacity Information

The Project's design and annual capacity information assumes that 65 percent heavy crude oil and 35 percent light crude oil will be transported.

### 4.5.2 Product Description

Enbridge transports a wide variety of petroleum products. The products, generally described, are condensate, light crude, medium crude, heavy crude, and natural gas liquids.

The Project is currently expected to transport heavy and light crude oil from the Western Canadian Sedimentary Basin, which spans the provinces of British Columbia, Alberta, Saskatchewan, and Manitoba, as well as the Northwest Territories.

### 4.5.3 Material Safety Data Sheets

Enclosed as Appendix F are Material Safety Data Sheets for the crude oil that may be transported on the Project.

## 4.6 Land Requirements

As proposed, the Project will require the acquisition of new permanent right-of-way and temporary workspace in Minnesota. Land requirements have been minimized by the Project's Preferred Route, which was selected to primarily share and/or run parallel to other existing Enbridge or third-party pipeline rights-of-way, and existing utility and transportation corridors.

The Project will require the acquisition of up to 50 feet of permanent right-of-way and up to 70 feet of temporary workspace, much of which has been previously disturbed where the Project parallels other existing utility and transportation corridors. The area necessary for new permanent right-of-way will vary in width depending on the terms of existing easements and the current alignment of existing pipelines or utilities within existing easements. The Temporary Workspaces (TWS) will be located adjacent to and contiguous with the proposed roght-of-way/permanent corridor and will be identified by distinctive staking of construction limits prior to clearing.

A more detailed discussion of the land requirements is provided in the following sections.

### 4.6.1 Typical Permanent Right-of-Way and Temporary Workspace

As noted above, the Project's Preferred Route will generally follow the existing Enbridge Mainline Corridor and run parallel to Line 67's existing pipeline right-of-way west of Clearbrook and then generally follow other existing third-party pipelines, electric transmission and transportation corridors east of Clearbrook. Shown on Table 4.6.1-1 below are the anticipated land requirements based on the location of the proposed 36-inch diameter pipeline. However, if NDPC's Sandpiper Pipeline is approved to be built in the Project's currently proposed route east of Clearbrook and it is constructed prior to the approval and construction of this Project, then the Project will share permanent right-of-way with the Sandpiper Pipeline.

| Preferred Route | TABLE 4.6.1-1<br>Anticipated Land Requirements | | | | | |
|---|---|---|---|---|---|---|
| | Description | ROW Configuration Drawing | Permanent ROW (ft.) | | Temporary Workspace (ft.) | Total Land Requirements (ft.) |
| | | | Shared ROW | New ROW | | |
| **West of Clearbrook** [a] | Where the Preferred Route will be co-located and run parallel to the existing Line 67pipeline. | Appendix G.1. | 25 (upland)<br>25 (wetland) | 25 (upland)<br>25 (wetland) | 70 (upland)<br>45 (wetland) | 120 (upland)<br>95(wetland) |
| **East of Clearbrook** | Where the Preferred Route will be located parallel to other existing third-party pipeline right-of-ways, existing electric transmission lines. | Appendix G.2. | N/A | 50 (upland)<br>50 (wetland) | 70 (upland)<br>45 (wetland) | 120 (upland)<br>95 (wetland) |
| **Greenfield** | Where Project's Preferred Route is greater than 250 ft. from existing pipeline ROW, utility or transportation corridors. | Appendix G.3 | N/A | 50 (upland)<br>50 (wetland) | 70 (upland)<br>45 (wetland) | 120 (upland)<br>95 (wetland) |
| **East of Clearbrook** [a] (Assumes Sandpiper is constructed first) | Where the Preferred Route will be co-located and run parallel to the Sandpiper pipeline, assuming Sandpiper is constructed first. | Appendix G.4 | 25 (upland)<br>25 (wetland) | 25 (upland)<br>25 (wetland) | 70 (upland)<br>45 (wetland) | 120 (upland)<br>95(wetland) |

[a] Where Preferred Route will share permanent ROW with any existing Enbridge owned or operated pipeline.

Overall, the amount of new permanent right-of-way to be acquired is anticipated to be limited to 1,042.8 acres (see Table 7.5.3-1 in Section 7.0 of this Application). In total, Project construction will affect approximately 5,098.7 acres of land (see Table 7.5.2-1 in Section 7.0 of this Application).

As noted in Table 4.6.1-1 above, the ROW configuration drawings depicting the typical Project construction footprint in upland and wetland areas are included in Appendix G of this Application.

### 4.6.2 Additional Temporary Workspace (ATWS)

In certain limited areas, the Project's Preferred Route may require additional temporary workspace when encountering environmental features that require special construction methods.

For example, Enbridge may require ATWS in locations where side sloping terrain requires additional soil management to build a working area for:

- Construction equipment and working personnel to travel safely within the Project's construction site;

- Environmental monitoring and mitigation to be employed as required; and
- Continuous ingress/egress for emergency equipment in the event of an accident during construction.

For special construction techniques such as horizontal directional drilling (HDD) or boring at roads and waterbodies, ATWS will also be required. For instance, ATWS will be needed where a pull string cannot be placed within the normal workspace footprint and additional area is needed to align the drill paths so the pipe can be installed continuously without stopping.

### 4.6.3 Above-Ground Facilities

The only above-ground facilities for the Project are valves (for which Enbridge acquires a separate and distinct easement) and pumping facilities (for which Enbridge acquires land in fee). The total estimated acreage acquired for the pump stations is provided at Table 4.3.1-2 above. Valves and other above-ground appurtenances will require approximately 15 acres. Enbridge is currently working with its landowners to acquire land for each of the potential sites. As previously mentioned above, the locations of these facilities are subject to change until the final engineering design and hydraulic studies are completed.

### 4.6.4 Trench Dimensions

Typical trench dimensions are included in Table 4.6.4-1 below. The total amount of soil excavated during construction will be approximately 2.17 million cubic yards that is then returned to the trench during the Project's backfill operation.

**Table 4.6.4-1**
**Typical Trench Dimensions**

| | **36-inch outside diameter pipe** |
|---|---|
| Minimum ditch depth to allow for a nominal 36-inches of ground cover to the top of the pipe | 72-inches |
| Trench width at the bottom | 5-feet |
| Trench width at the top | 7-feet |

### 4.6.5 Minimum Depth of Cover

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, which is provided below:

> § 195.248 Cover over buried pipeline.
> (a)Unless specifically exempted in this subpart, all pipes must be buried so that it is below the level of cultivation. Except as provided in paragraph (b) of this section, the pipe must be installed so that the cover between the top of the pipe and the ground level, road bed, river bottom, or underwater natural bottom (as determined by recognized and generally accepted practices), as applicable, complies with the Table 4.6.5-1.

| Table 4.6.5-1: Location | Cover in inches (millimeters) | |
|---|---|---|
| | For normal excavation | For rock excavation [1] |
| Industrial, commercial, and residential areas | 36 (914) | 30 (762) |
| Crossing of inland bodies of water with a width of at least 100 feet (30 millimeters) from high water mark to high water mark | 48 (1219) | 18 (457) |
| Drainage ditches at public roads and railroads | 36 (914) | 36 (914) |
| Deepwater port safety zones | 48 (1219) | 24 (610) |
| Gulf of Mexico and its inlets in waters less than 15 feet (4.6 meters) deep as measured from mean low water | 36 (914) | 18 (457) |
| Other offshore areas under water less than 12 ft. (3.7 meters) deep as measured from mean low water | 36 (914) | 18 (457) |
| Any other area | 30 (762) | 18 (457) |

[1] Rock excavation is any excavation that requires blasting or removal by equivalent means.

Pursuant to the federal regulations, the majority of the pipeline could be buried with a depth of cover of 30 inches, since the majority of the proposed pipeline is not located in industrial, commercial, or residential areas as demonstrated in Sections 6.6 and 7.5 of the Application. However, while Enbridge will ensure that it complies with the federal minimum depth of cover requirements, it will also target a nominal 48 inches of cover, where possible and preferred.

Where the pipeline crosses cultivated agricultural lands, state law requires that a minimum depth of cover of 54 inches be maintained, unless waived by the landowner[2]. To implement the targeted nominal 48 inches of cover, landowners in areas where the pipeline crosses cultivated agricultural lands will be asked to waive the 54-inch minimum cover requirement, as Enbridge has done during the construction of Enbridge's previous 1994, 1998, 2002 and 2008-2009 pipeline

[2] Minn. Stat. 2014, § 216G.07, subd. 1.

projects. In those cases where waivers are not obtained, a minimum cover of 54 inches will be achieved.

### 4.6.6 Right-of-Way Sharing and Paralleling

Enbridge has identified by Mile Post those locations where its Preferred Route follows other existing pipeline right-of-ways, utilities, and transportation corridors. Additionally, Enbridge has defined a greenfield segment as any area where its Preferred Route is greater than 250 feet from an existing pipeline, utility, or transportation corridor and has also identified such areas by Mile Post. The following tables show both where the route parallels other existing corridors and any greenfield segments along the Preferred Route west of Clearbrook and east of Clearbrook as detailed below.

**West of Clearbrook** - Approximately 98 percent of the Preferred Route from the North Dakota border in Kittson County to Enbridge's Clearbrook Terminal in Clearwater County will parallel existing Enbridge pipelines and other existing utility corridors as shown on Table 4.6.6-1 below.

**Table 4.6.6-1**
**Line 3 Replacement Project - Paralleling Other Corridors West of Clearbrook**

| Begin Mile Post | End Mile Post | Enbridge Pipelines | Third-Party Pipelines | Other Utilities Corridors | Roads/Railroads/ Highways | Greenfield | Paralleling Miles | Greenfield Miles | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| 12.3 | 24.43 | X | | | | | 12.09 | | |
| 24.43 | 25.27 | | | | | X | | 0.84 | |
| 25.27 | 39.05 | X | | | | | 13.78 | | |
| 39.05 | 39.81 | | | | | X | | 0.76 | |
| 39.81 | 88.17 | X | | | | | 48.36 | | |
| 88.17 | 88.66 | | | | | X | | 0.49 | |
| 88.66 | 90.40 | X | | | | | 1.74 | | |
| 90.40 | 96.60 | X | | | X | | 6.20 | | |
| 96.6 | 98.00 | X | | | | | 1.40 | | |
| 98.00 | 103.90 | X | | | X | | 5.90 | | |
| 103.90 | 121.10 | X | | | | | 17.20 | | |
| 121.10 | 122.51 | | | X | | | 1.41 | | |
| 122.51 | 122.59 | | | | | X | | 0.08 | |
| 122.59 | 122.8 | X | | | | | 0.21 | | |
| **Ends at Clearbrook Terminal at M.P. 123-W** | | | | | | **Total Miles** | 108.29 | 2.17 | 110.46 |
| **Percentages** | | | | | | | 98.04% | 1.96% | |

**East of Clearbrook** – Approximately 75 percent of the Preferred Route from the Enbridge Clearbrook Terminal in Clearwater County to the Wisconsin border in Carlton County will parallel an existing third-party pipeline right-of-way, and other existing utility and transportation corridors as shown on Table 4.6.6-2 below.

**Table 4.6.6-2**
**Line 3 Replacement Project - Paralleling Other Corridors East of Clearbrook**

| Begin Mile Post | End Mile Post | Enbridge Pipelines | Third-Party Pipelines | Other Utilities Corridors | Roads/Railroads/ Highways | Greenfield | Paralleling Miles | Greenfield Miles | Total |
|---|---|---|---|---|---|---|---|---|---|
| **East of Clearbrook** | | | | | | | | | |
| 0.00 | 0.56 | | | | X | | 0.56 | | |
| 0.56 | 1.56 | | | | | X | | 1.00 | |
| 1.56 | 1.90 | | X | X | | | 0.34 | | |
| 1.90 | 2.85 | | X | | | | 0.95 | | |
| 2.85 | 3.10 | | X | X | | | 0.25 | | |
| 3.10 | 3.25 | | | X | | | 0.15 | | |
| 3.25 | 15.90 | | X | | | | 12.65 | | |
| 15.90 | 16.65 | | X | X | | | 0.75 | | |
| 16.65 | 16.67 | | | | | X | | 0.02 | |
| 16.67 | 24.58 | | X | | | | 7.91 | | |
| 24.58 | 24.90 | | | | | X | | 0.32 | |
| 24.90 | 25.94 | | X | | | | 1.04 | | |
| 25.94 | 25.98 | | | | | X | | 0.04 | |
| 25.98 | 29.90 | | X | | | | 3.92 | | |
| 29.90 | 30.30 | | X | X | | | 0.40 | | |
| 30.30 | 31.50 | | X | | | | 1.20 | | |
| 31.50 | 32.03 | | | | | X | | 0.53 | |
| 32.03 | 32.44 | | X | | | | 0.41 | | |
| 32.44 | 32.84 | | | | | X | | 0.40 | |
| 32.84 | 35.50 | | X | | | | 2.66 | | |
| 35.50 | 35.65 | | | | | X | | 0.15 | |
| 35.65 | 38.48 | | X | | | | 2.83 | | |
| 38.48 | 39.08 | | | | | X | | 0.60 | |
| 39.08 | 39.15 | | | | X | | 0.07 | | |
| 39.15 | 39.20 | | | | | X | | 0.05 | |
| 39.20 | 39.45 | | | | X | | 0.25 | | |
| 39.45 | 39.60 | | | | | X | | 0.15 | |
| 39.60 | 48.81 | | X | | | | 9.21 | | |
| 48.81 | 48.89 | | | | | X | | 0.08 | |
| 48.89 | 56.70 | | X | | | | 7.81 | | |

**Table 4.6.6-2**
**Line 3 Replacement Project - Paralleling Other Corridors East of Clearbrook**

| Begin Mile Post | End Mile Post | Enbridge Pipelines | Third-Party Pipelines | Other Utilities Corridors | Roads/Railroads/ Highways | Greenfield | Paralleling Miles | Greenfield Miles | Total |
|---|---|---|---|---|---|---|---|---|---|
| 56.70 | 58.33 | | | | | X | | 1.63 | |
| 58.33 | 64.79 | | X | | | | 6.46 | | |
| 64.79 | 65.03 | | | | | X | | 0.24 | |
| 65.03 | 65.70 | | X | | | | 0.67 | | |
| 65.70 | 71.00 | | | X | | | 5.30 | | |
| 71.00 | 71.33 | | | X | X | | 0.33 | | |
| 71.33 | 71.41 | | | | | X | | 0.08 | |
| 71.41 | 72.35 | | | X | | | 0.94 | | |
| 72.35 | 73.15 | | | X | X | | 0.80 | | |
| 73.15 | 76.13 | | | X | | | 2.98 | | |
| 76.13 | 76.33 | | | | | X | | 0.20 | |
| 76.33 | 76.76 | | | | X | | 0.43 | | |
| 76.76 | 83.90 | | | | | X | | 7.14 | |
| 83.90 | 85.03 | | | | X | | 1.13 | | |
| 85.03 | 86.23 | | | | | X | | 1.20 | |
| 86.23 | 86.47 | | | | X | | 0.24 | | |
| 86.47 | 86.50 | | | | | X | | 0.03 | |
| 86.50 | 113.67 | | | X | | | 27.17 | | |
| 113.67 | 113.95 | | | | | X | | 0.28 | |
| 113.95 | 114.23 | | | X | | | 0.28 | | |
| 114.23 | 114.54 | | | | | X | | 0.31 | |
| 114.54 | 116.85 | | | X | | | 2.31 | | |
| 116.85 | 117.05 | | | | X | | 0.20 | | |
| 117.05 | 119.75 | | | X | | | 2.70 | | |
| 119.75 | 120.07 | | | | X | | 0.32 | | |
| 120.07 | 120.71 | | | | | X | | 0.64 | |
| 120.71 | 120.81 | | | | X | | 0.10 | | |
| 120.81 | 121.97 | | | | | X | | 1.16 | |
| 121.97 | 122.20 | | | | X | | 0.23 | | |
| 122.20 | 127.04 | | | X | | | 4.84 | | |
| 127.04 | 128.43 | | | | | X | | 1.39 | |
| 128.43 | 132.36 | | | X | | | 3.93 | | |
| 132.36 | 132.46 | | | | | X | | 0.10 | |
| 132.46 | 141.00 | | | X | | | 8.54 | | |
| 141.00 | 141.82 | | | | X | | 0.82 | | |
| 141.82 | 144.08 | | | | | X | | 2.26 | |

**Table 4.6.6-2**
**Line 3 Replacement Project - Paralleling Other Corridors East of Clearbrook**

| Begin Mile Post | End Mile Post | Enbridge Pipelines | Third-Party Pipelines | Other Utilities Corridors | Roads/Railroads/ Highways | Greenfield | Paralleling Miles | Greenfield Miles | Total |
|---|---|---|---|---|---|---|---|---|---|
| 144.08 | 144.41 | | | | X | | 0.33 | | |
| 144.41 | 155.50 | | | | | X | | 11.09 | |
| 155.50 | 155.86 | | | X | | | 0.36 | | |
| 155.86 | 159.30 | | | | | X | | 3.44 | |
| 159.30 | 159.60 | | | X | X | | 0.30 | | |
| 159.60 | 160.34 | | | | | X | | 0.74 | |
| 160.34 | 162.10 | | | X | | | 1.76 | | |
| 162.10 | 162.60 | | | X | X | | 0.50 | | |
| 162.60 | 163.18 | | | X | | | 0.58 | | |
| 163.18 | 166.84 | | | | | X | | 3.66 | |
| 166.84 | 168.21 | | | | X | | 1.37 | | |
| 168.21 | 175.18 | | | | | X | | 6.97 | |
| 175.18 | 177.35 | | | | X | | 2.17 | | |
| 177.35 | 177.80 | | | | | X | | 0.45 | |
| 177.80 | 180.00 | | | X | | | 2.20 | | |
| 180.00 | 180.32 | | | | | X | | 0.32 | |
| 180.32 | 184.54 | | | X | | | 4.22 | | |
| 184.54 | 191.13 | | | | | X | | 6.59 | |
| 191.13 | 207.51 | | | X | | | 16.38 | | |
| 207.51 | 207.98 | | | | | X | | 0.47 | |
| 207.98 | 208.35 | | X | | | | 0.37 | | |
| 208.35 | 209.10 | | | | | X | | 0.75 | |
| 209.10 | 209.36 | | X | | | | 0.26 | | |
| 209.36 | 211.70 | | | | | X | | 2.34 | |
| 211.70 | 212.18 | | | X | | | 0.48 | | |
| 212.18 | 212.43 | | | | | X | | 0.25 | |
| 212.43 | 213.74 | | | X | | | 1.31 | | |
| 213.74 | 214.00 | | | | X | | 0.26 | | |
| 214.00 | 214.09 | | | | | X | | 0.09 | |
| 214.09 | 214.64 | | | X | | | 0.55 | | |
| 214.64 | 214.80 | | | | | X | | 0.16 | |
| 214.80 | 218.10 | | | X | | | 3.30 | | |
| 218.10 | 219.25 | | X | | | | 1.15 | | |
| 219.25 | 220.1 | X | | | | | 0.85 | | |
| 220.10 | 220.5 | X | X | | | | 0.40 | | |
| 220.50 | 220.9 | X | | | | | 0.40 | | |

| Table 4.6.6-2<br>Line 3 Replacement Project - Paralleling Other Corridors East of Clearbrook | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Begin Mile Post | End Mile Post | Enbridge Pipelines | Third-Party Pipelines | Other Utilities Corridors | Roads/Railroads/ Highways | Greenfield | Paralleling Miles | Greenfield Miles | Total |
| 220.90 | 221.19 | X | X | | | | 0.29 | | |
| 221.19 | 223.92 | X | | | | | 2.73 | | |
| 223.92 | 226.60 | | X | | | | 2.68 | | |
| Ends at Minnesota/Wisconsin Border M.P. 227-E | | | | | | Total Miles | 169.28 | 57.32 | 226.60 |
| | | | | | | Percentages | 74.70% | 25.30% | |

Of the total mileage, approximately 82 percent runs parallel to existing pipelines, utilities and transportation corridors.

### 4.6.7 Project Widths

The Preferred Route width, environmental survey area, and permanent right-of-way width are depicted in Table 4.6.7-1 below.

| Table 4.6.7-1<br>Typical Project Widths | |
|---|---|
| **Type** | **Typical Width** |
| Preferred Route Width* | 700 feet<br>(see Appendix B.3 ) |
| Environmental Survey Area** | 300 feet: east of Clearbrook<br>450 – 500 feet: west of Clearbrook<br>(see Appendix B.3) |
| Permanent Right-of-Way Width | 50 feet<br>(typically 25 feet of new ROW and 25 feet of shared ROW west of Clearbrook, and typically 50 feet of new ROW east of Clearbrook) |
| *The Preferred Route Width includes the minimum area where Enbridge has undertaken a desktop analysis of available environmental data.<br>**The Environmental Survey Area is the minimum area where Enbridge collected and analyzed in-field data. | |

## 4.7 Pipeline Estimated Costs and Accessibility

The U.S. portion of the Replacement Program will cost approximately $2.6 billion to design, permit, and construct, of which the Minnesota portion of the Replacement Program accounts for approximately $2.1 billion.

Enbridge operates as a common carrier pursuant to federal law. As a common carrier, Enbridge's applicable rates, tariffs, and accounting practices are subject to the regulatory authority of the FERC. Enbridge's currently-effective FERC tariffs regarding transportation of crude oil by pipeline are available at http://www.enbridge.com/Informational-Postings.aspx.[3] Enbridge's FERC tariffs do not address transportation by specific lines within the Enbridge pipeline system (for example, Line 3). Rather, they apply to the transportation of crude petroleum by pipeline from various receipt points specified in the tariff to various delivery points specified in the tariff. Line 3 is one of a number of separate pipelines that transport crude petroleum between the International Boundary near Neche, North Dakota, and Superior, Wisconsin, with intermediate receipts and deliveries in Clearbrook, Minnesota. Thus, the rates, terms, and conditions specified for transportation originating at the International Boundary near Neche, North Dakota, or at Clearbrook, Minnesota, are applicable to those volumes of crude petroleum transported on Line 3. Because the applicable rate is the same regardless of which specific pipeline is used between those points, Enbridge determines which volumes move on which specific pipeline as an operational matter, considering the overall efficiency of the pipeline system and other relevant operational factors.

[3] Tariffs for the Enbridge Mainline System, including Line 3, are available at the link to the "Lakehead Tariffs and Tolls" under the "Liquids Pipelines and Storage" section (http://www.enbridge.com/Informational-Postings/Lakehead-Tariffs-and-Tolls.aspx).

## 4.8 Project Schedule

The Project time schedule is shown in Table 4.8-1 below.

**Table 4.8-1**
**Project Schedule**

| Description | Requested On or Before |
|---|---|
| Construction Start Date | 3rd Quarter of 2016 |
| Anticipated Construction Complete[4] | 4th Quarter of 2017 |
| In-Service Date | 4th Quarter of 2017 |

## 4.9 Project Expansion

There are no current plans for expansion of the Project.

[4] Construction complete date means when the pipeline is ready for service. Restoration activities will continue after such date until completed in accordance with environmental permitting requirements and land restoration as specified in landowner's easement or permits.