



Enbridge Pipelines (North Dakota) LLC
Before the Minnesota Public Utilities Commission
Docket No. PL-6668/PPL-13-474
November 2013



Application for Routing Permit



BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

**Beverly Jones Heydinger
Dr. David C. Boyd
Nancy Lange
J. Dennis O'Brien
Betsy Wergin**

**Chair
Commissioner
Commissioner
Commissioner
Commissioner**

**In the Matter of the Application of
Enbridge Pipelines (North Dakota) LLC
For a Pipeline Routing Permit for the
Sandpiper Pipeline Project**

MPUC Docket No. PL-6668/PPL-13-474

APPLICATION SUMMARY

Enbridge Pipelines (North Dakota) LLC (“EPND”)¹ is proposing to construct a new 612-mile 24-inch and 30-inch diameter crude oil pipeline as part of its ongoing efforts to meet North America’s needs for reliable and secure transportation of petroleum energy supplies. EPND is submitting an application for a pipeline routing permit from the Minnesota Public Utilities Commission pursuant to Minnesota Rule 7852.0800.

The project, known as the Sandpiper Pipeline Project (“Project” or “Sandpiper”), will transport Bakken and Three Forks crude oil from growing production regions in the Williston Basin² of eastern Montana and western North Dakota. The Project begins at EPND’s Beaver Lodge Station, south of Tioga, North Dakota and extends to a new terminal facility to be constructed at Clearbrook, Minnesota, and then on to an Enbridge affiliate’s terminal and tank farm facility in Superior, Wisconsin. From the Superior terminal, the crude oil volumes will be transported to other refining markets via the Enbridge Mainline System. Approximately 299 miles of the Project will cross Minnesota. The preferred route for the Project is co-located, to the extent practicable, with EPND’s existing right-of-way or other third-party rights-of-way in Minnesota. The preferred route in Minnesota will traverse Polk, Red Lake, Clearwater, Hubbard, Cass, Crow Wing, Aitkin, and Carlton counties.

In addition to the new pipeline, the Project involves adding a new terminal with two 150,000 barrel tanks and a new pump station near Clearbrook, Minnesota; mainline valves at major waterbody crossings and over the length of the preferred route; and Pipeline Inspection Gauge launcher and receiver traps along with one of the mainline valves at a site near Pine River, Minnesota.

¹ Enbridge Pipelines (North Dakota) LLC, is a limited liability company duly organized under the laws of the State of Delaware and is referred to as “EPND” in this document. EPND is a wholly owned subsidiary of Enbridge Energy Partners, L.P. (“EEP”) which is a Delaware master limited partnership. Enbridge Energy, Limited Partnership, a wholly owned subsidiary of EEP and an affiliate of Enbridge Inc., owns and operates the U.S. portion of the existing Enbridge Mainline System. Collectively, the affiliated entities excluding EPND are referred to as “Enbridge” in this document.

² The Bakken formation is currently the largest contributor to the total crude oil production in the Williston Basin, the oil industry refers to all of the crude oil production in the Williston Basin as “Bakken crude oil”.

The Project's purpose is to transport growing supplies of oil produced in North Dakota to the terminals in Clearbrook, Minnesota and Superior, Wisconsin. From these terminals, the crude oil can be shipped on various other pipelines, ultimately providing refineries in Minnesota, other states in the Midwest and the East Coast with crude oil. The Project will provide up to 225,000 barrels per day of new crude oil capacity from North Dakota to meet the demand for safe and economical transportation capacity.³

Pending regulatory approval by the Minnesota Public Utilities Commission, the Project would be in service in the first quarter of 2016. The Project is in the public interest because it provides the timely addition of incremental capacity necessary to connect the increasing Bakken production to refining centers in the Midwest and beyond. The Project's additional pipeline capacity will help alleviate the lack of crude oil pipeline infrastructure from the Williston Basin to premium refinery and marketing hubs, thereby serving the public interest by providing improved refinery access to an abundant, secure, and reliable source of crude oil supply.

³ The Project will have a capacity of 375,000 bpd between Clearbrook, Minnesota and Superior, Wisconsin. Total new capacity, however, is 225,000 bpd as the 150,000 bpd that will enter Sandpiper at Clearbrook is currently transported to Clearbrook on EPND's existing Line 81 and to Superior, Wisconsin on the Enbridge Mainline System.

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ACRONYMS

AMA	Aquatic Management Area
APP	Agricultural Protection Plan
bbf	Barrel
bpd	Barrels Per Day
C.F.R.	Code of Federal Regulations
DWSMA	Drinking Water Supply Management Area
EEP	Enbridge Energy Partners, L.P.
EIR	Environmental Information Report
EPA	U.S. Environmental Protection Agency
EPND	Enbridge Pipelines (North Dakota) LLC
EPP	Environmental Protection Plan
GIS	Geographic Information Systems
HDD	Horizontal Directional Drill
HP	Horse power
MDH	Minnesota Department of Health
MNDNR	Minnesota Department of Natural Resources
MNDOT	Minnesota Department of Transportation
MNOPS	Minnesota Office of Pipeline Safety
MP	Milepost
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
MSDS	Materials Safety Data Sheet
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OD	Outside Diameter
ORVW	Outstanding Resource Value Waters
PHMSA	Pipeline and Hazardous Materials Safety Administration
PIG	Pipeline Inspection Gauge
ppmw	Parts per million by weight
Project	Sandpiper Pipeline Project
psig	Pounds per Square Inch (Gauge)
SHPO	Minnesota State Historic Preservation Office
SSURGO	Soil Survey Geographic
STATSGO2	State Soil Geographic
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VFD	Variable Frequency Drives
VOC	Volatile Organic Compounds
WMA	Wildlife Management Area

Subpart 4. Background information.

Each application must contain the following information:

A. the applicant's complete name, address and telephone number:

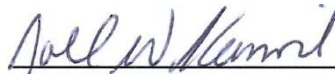
Enbridge Pipelines (North Dakota) LLC
1100 Louisiana, Suite 3300
Houston, Texas 77002
(713) 821-2000

B. the complete name, title, address, and telephone number of the authorized representative or agent to be contacted concerning the applicant's filing:

EPND Senior Legal Counsel	EPND External Counsel
James Watts	Kevin Walli
Enbridge Pipelines (North Dakota) LLC	Fryberger, Buchanan, Smith & Frederick
119 N. 25 th Street E.	332 Minnesota Street, Suite W1260
Superior, Wisconsin 54880	St. Paul, Minnesota 55101
218-464-5600	651-221-1044
james.watts@enbridge.com	kwalli@fryberger.com

- C. the signatures and titles of persons authorized to sign the application, and the signature of the preparer of the application if prepared by an outside representative or agent;

This application is submitted by Enbridge Pipelines (North Dakota) LLC.

A handwritten signature in blue ink that reads 'Joel W. Kanvik'.

Joel W. Kanvik
Assistant Secretary
Enbridge Pipelines (North Dakota) LLC

D. a brief description of the proposed project which includes:**(1) general location;**

The Sandpiper Pipeline Project (“Project” or “Sandpiper”) will be constructed from the Enbridge Pipelines (North Dakota) LLC (“EPND”)¹ Beaver Lodge Station south of Tioga, North Dakota to an existing Enbridge affiliate terminal in Superior, Wisconsin; a total Project length of approximately 612 miles. Approximately 299 miles will be located in Minnesota, beginning at the North Dakota border in Polk County, and extending east to Clearbrook, Minnesota. In Minnesota, the Project comprises 75 miles of 24-inch outside diameter (“OD”) pipe west of Clearbrook, Minnesota and 224 miles of 30-inch OD pipe east of Clearbrook. The preferred route is co-located, to the extent practicable, with EPND’s existing right-of-way or other third-party rights-of-way in Minnesota. In Minnesota, the preferred route follows the EPND System from the North Dakota border south of Grand Forks, North Dakota to Clearbrook, Minnesota. The preferred route then turns south and generally follows the existing Minnesota Pipe Line Company right-of-way to Hubbard, Minnesota. From Hubbard, the preferred route turns east, following parts of existing electrical transmission and railroad lines before terminating in Superior, Wisconsin. The preferred route in Minnesota will traverse Polk, Red Lake, Clearwater, Hubbard, Cass, Crow Wing, Aitkin, and Carlton counties.

In addition to the new pipeline, the Project involves adding a new terminal with two 150,000 barrel (“bbl”) tanks and a new pump station near Clearbrook, Minnesota; mainline valves at major waterbody crossings and over the length of the preferred route; and Pipeline Inspection Gauge (“PIG”) launcher and receiver traps along with a mainline valve at a site near Pine River, Minnesota.

(2) planned use and purpose;

The purpose of the Project is to transport growing supplies of oil produced in North Dakota to the terminals in Clearbrook, Minnesota and Superior, Wisconsin. From these terminals, the crude oil can be shipped on various other pipelines, eventually providing refineries in Minnesota, and other states in the Midwest and the East Coast with crude oil. To meet the need for safe and economical transportation capacity, the Project will provide up to 225,000

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barrels per day (“bpd”) of new crude oil capacity from North Dakota.² EPND’s shippers will use the Sandpiper pipeline for the transportation of crude oil to Enbridge’s breakout tankage facilities at Clearbrook, Minnesota or Superior, Wisconsin. At Clearbrook, the crude oil will be delivered to interconnected facilities operated by Minnesota Pipe Line Company for delivery to the Flint Hills and St. Paul refineries in Minnesota. At Superior, the crude oil will be delivered into the Enbridge Mainline System and other third-party pipelines for delivery to refineries in the Midwest and the East Coast.

(3) estimated cost;

The estimated cost for the Project is US \$2.6 billion. The estimated cost for the Minnesota portion of the Project is US \$1.2 billion.

(4) planned in-service date; and

EPND plans to begin construction of the Project in the fourth quarter of 2014 with an anticipated completion and in-service date of first quarter 2016.

(5) general design and operational specifications for the type of pipeline for which an application is submitted.

The Project will have an annual capacity of 250,000 bpd in North Dakota between Beaver Lodge and Berthold, an annual capacity of 225,000 bpd from Berthold, North Dakota to Clearbrook, Minnesota and an annual capacity of 375,000 bpd from Clearbrook, Minnesota to Superior, Wisconsin. Within Minnesota, the 24-inch-diameter segment from the North Dakota border to Clearbrook, Minnesota will have an annual average capacity of 225,000 bpd. At Clearbrook, Minnesota, Sandpiper will receive up to an additional 150,000 bpd from the existing EPND Line 81. The segment from Clearbrook, Minnesota to the Wisconsin border will be a 30-inch diameter pipeline and will have an annual average capacity of 375,000 bpd. Additionally, Sandpiper will have the ability to provide redundant service³ at Clearbrook to the existing EPND Line 81 deliveries in order to ensure reliable deliveries of 60,000 bpd annual capacity into the Minnesota Pipe Line Company system for delivery to Minnesota refineries.

Liquids pipelines are generally designed at a specified capacity for a known liquid. Most liquids pipelines transport a variety of liquids. 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 in this case, grades of crude oil, are shipped at different times, generally in a repeatable sequence. Both the fluid characteristics and

² The Project will have a capacity of 375,000 bpd between Clearbrook, Minnesota and Superior, Wisconsin. Total new capacity, however, is 225,000 bpd as the 150,000 bpd that will enter Sandpiper at Clearbrook is currently transported to Clearbrook on EPND’s existing Line 81 and to Superior, Wisconsin on the Enbridge Mainline System.

³ Redundant service is indicative of system design that allows for duplication of delivery if one component is unavailable.

batch sequence will affect the capacity of the pipeline. Table 7852.2100-D provides design data pertinent to the new 24-inch and 30-inch portions of the pipeline.

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

- **Design Capacity:** The theoretical 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 theoretically ideal operating conditions.
- **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% of Design Capacity, and represents the capacity requested in this application.

Table 7852.2100-D Sandpiper Pipeline Project Capacity Definitions			
		24-inch Pipeline from Berthold, ND to Clearbrook, MN (barrels per day)	30-inch Pipeline from Clearbrook, MN to Superior, WI (barrels per day)
Ultimate Design Capacity	Maximum economic expansion capacity of individual line. Requires additional pumping horsepower over current design to meet this capacity.	406,000	711,000
Ultimate Annual Capacity	Maximum economic expansion capacity of individual pipeline that is sustainable average daily rate per day over a year.	365,000	640,000
Initial Design Capacity	Theoretical capacity.	250,000	417,000
Initial Annual Capacity (90%)	Average sustainable rate: average barrels per day over a year (90% of Design Capacity).	225,000	375,000

7852.2200 PROPOSED PIPELINE AND ASSOCIATED FACILITIES DESCRIPTION

Subpart 1. Pipeline design specifications.

The specifications for pipeline design and construction are assumed to be in compliance with all applicable state and federal rules or regulations unless determined otherwise by the state or federal agency having jurisdiction over the enforcement of such rules or regulations. For public information purposes, the anticipated pipeline design specifications must include but are not limited to: A. pipe size (outside diameter) in inches; B. pipe type; C. nominal wall thickness in inches; D. pipe design factor; E. longitudinal or seam joint factor; F. class location and requirements, where applicable; G. specified minimum yield strength in pounds per square inch (psi); and H. tensile strength in pounds per square inch.

Table 7852.2200-1 Sandpiper Pipeline Project Pipe Specifications		
Explanation	ND Border to Clearbrook, MN	Clearbrook, MN to WI Border
Pipe Size (Diameter)	24-inch outside diameter (NPS 24)	30-inch outside diameter (NPS 30)
Pipe Type (Grade)	X70 Carbon steel pipe manufactured according to American Petroleum Institute (API) Specifications 5L PS2	X70 Carbon steel pipe manufactured according to American Petroleum Institute (API) Specifications 5L PS2
Wall Thickness	0.375 inch	0.469 inch
Length	75 miles	224 miles
Pipe Design Factor	0.72	0.72
Longitudinal Seam Factor	1.0	1.0
Class Location & Requirements	Not applicable (applies to natural gas pipelines)	Not applicable (applies to natural gas pipelines)
Coating	Fusion Bond Epoxy	Fusion Bond Epoxy
Specified Minimum Yield Strength (psi)	70,000 psi	70,000 psi
Tensile Strength (psi)	82,000 psi	82,000 psi

Subpart 2. Operating pressure.

Operating pressure must include:

A. operating pressure (psig); and

1,352 pounds per square inch gauge (“psig”) (at station discharge)

B. maximum allowable operating pressure (psig).

1,480 psig

Subpart 3. Description of associated facilities.

For public information purposes, the applicant shall provide a general description of all pertinent associated facilities on the right-of-way.

EPND will establish a new terminal in Clearbrook, Minnesota. The new terminal will consist of two (2) 150,000 bbl tanks, two (2) 500 horse power (“HP”) injection pumps to inject 150,000 bpd from the existing EPND Line 81 into the Sandpiper pipeline, two (2) 650 HP transfer pumps for delivery to EPND, and three (3) sets of leak detection meters (1 set for delivery from the Sandpiper to EPND tankage, 1 set for Line 81 delivery to EPND tankage, and 1 set for flow injection from EPND tankage into the Sandpiper pipeline). It will also include all associated terminal piping, interconnections, valves, manifold, and sumps as well as an electrical substation, a fire suppression system (e.g. building, pond, and piping), a maintenance building and a cold storage building. Schematic drawings of the new terminal facilities are depicted on station plat drawings in Appendix G.3 of the Environmental Information Report¹ (“EIR”).

Additionally, mainline pumping facilities will be installed at the new terminal at Clearbrook, Minnesota. These facilities include four (4) 5,500 HP pumps, four (4) 5,750 HP Variable Frequency Drives (“VFD”) a pump shelter, four (4) VFD buildings, and a switchgear building. Additionally, it will include two (2) coriolis meters, a 24-inch PIG receiver and a 30-inch PIG launcher as well as associated pump station piping and valves. A schematic drawing of the new pumping facility is depicted on station plat drawings in Appendix G.3 of the EIR.

Approximately 15 mainline valves are currently planned to be installed in Minnesota based on preliminary engineering design and environmental survey. Specifically, locations of valve installations will be near major rivers, other environmentally sensitive areas, population centers, and pumping stations. Preliminary valve locations are depicted on route maps included in Appendix G.5 of the EIR. A detailed engineering and environmental study will be performed and adjustments to the number and locations of valves will be made

¹ EPND has prepared an Environmental Information Report (“EIR”) for the Sandpiper Pipeline Project that provides a description of the existing environment along EPND’s preferred route, an analysis of potential human and environmental impacts, and a discussion of measures that will be implemented to protect and restore the right-of-way as well as mitigate adverse impacts.

as necessary.

Launch and receiver traps along with one of the mainline valves will be installed at a site near Pine River, Cass County, Minnesota. A schematic drawing of the facility is depicted on station plat drawings in Appendix G.3 of the EIR.

Subpart 4. Product capacity information.

The applicant shall provide information on planned minimum and maximum design capacity or throughput in the appropriate unit of measure for the types of products shipped as defined in part 7852.0100.

The Initial Design Capacity of the 24-inch-diameter segment will be 250,000 bpd from the North Dakota border to Clearbrook, Minnesota and 417,000 bpd for the 30-inch-diameter pipeline from Clearbrook to the Wisconsin border. Annual Capacity will be 225,000 bpd from the North Dakota border to Clearbrook, Minnesota, and 375,000 bpd from Clearbrook, Minnesota to the Wisconsin border, assuming all light crude oil is transported (see Table 7852.2100-D). The planned minimum capacity is half of the design capacity.

Subpart 5. Product description.

The applicant shall provide a complete listing of products the pipeline is intended to ship and a list of products the pipeline is designed to transport, if different from those intended for shipping.

The pipeline is expected to transport Light Sweet Crude Oil.

Subpart 6. Material safety data sheet.

For each type of product that will be shipped through the pipeline, the applicant shall provide for public information purposes the material identification, ingredients, physical data, fire and explosive data, occupational exposure limits, health information, emergency and first aid procedures, transportation requirements, and other known regulatory controls.

Material Safety Data Sheets ("MSDS") for the crude oil to be shipped on Sandpiper is included below.

Material Safety Data Sheet



1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer/Supplier: Enbridge Pipelines Inc.
 10201- Jasper Avenue
 Edmonton, Alberta T5J 3N7
 CANADA

Product Name: North Dakota Sweet (NSW), Crude Oil
 Synonyms: Bakken Crude Oil, US. High Sweet Clearbrook (UHC), Hydrocarbons of Petroleum
 General Information: 780-420-5306
 Emergency Telephone Number (24 hrs):
 CHEMTREC 800-424-9300 USA CANUTEC 613-996-6666 Canada
 Date Prepared: 10/7/2013



2 – PRODUCT COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	Normal % * by Wt./Vol.	Occupational Exposure Limits (ppm)		
			OSHA	ACGIH	NIOSH
Petroleum Hydrocarbons	68919-39-1	100	N/A	N/A	N/A
1t,2-dimethylcyclopentane	28729-52-4	1.8	None	None	None
2-methylhexane	591-76-4	1.0	None	None	None
2-methylpentane	107-83-5	1.8	None	500	100
3-methylhexane	589-34-4	1.6	None	None	None
3-methylpentane	96-14-0	1.3	None	500	100
2-methylheptane	592-27-8	1.4	None	300	None
Benzene	71-43-2	0.4	1	0.5	0.1
cyclohexane	110-82-7	1.0	300	100	300
i-pentane	109-66-0	1.8	1000	600	120
methylcyclohexane	108-87-2	2.3	500	400	400
methylcyclopentane	96-37-7	2.2	None	None	None
n-butane	106-97-8	1.9	800	1000	800
n-heptane	142-82-5	3.4	500	400	85
n-Hexane	110-54-3	3.4	50	50	50
n-Pentane	109-66-0	3.4	600	600	120
n-octane	111-65-9	3.0	500	300	75

n-nonane	111-84-2	2.2	None	200	200
n-decane	124-18-5	2.0	None	None	None
n-undecane	1120-21-4	1.7	None	None	None
n-dodecane	112-40-3	1.5	None	None	None
n-tridecane	629-50-5	1.3	None	None	None
Toluene	108-88-3	0.9	100	20	100
Hydrogen sulfide	7783-06-4	<0.00001	20 ^{Ceiling}	1	10 ^{Ceiling}
Ethylbenzene	100-41-4	0.6	100	20	100
Xylenes	1330-20-7	0-5	100	100	100

* Values do not reflect absolute minimums and maximums; those values may vary from time to time.
 N/A - Not Available

3 – HAZARDS IDENTIFICATION

Flammability: Flammable liquid and vapor. Keep away from heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, mechanical/electrical equipment).
 HMIS Classification for Flammability: 3

Stability: Stable under normal conditions. Avoid all sources of ignition.
 HMIS Classification for Reactivity: 1

Potential Health Effects from Overexposure

Acute Effects:

Ingestion: Ingestion may result in nausea, vomiting, diarrhea and central nervous system depression. Aspiration of liquid into the lungs must be avoided as even small quantities in the lungs can produce chemical pneumonitis, pulmonary edema/hemorrhage and even death.

Skin Contact: Prolonged and repeated contact may cause defatting and drying of the skin and can lead to irritation and/or dermatitis.

Eye Contact: Liquid or vapor contact may cause mild eye irritation, including stinging, watering, redness and swelling. Hydrogen sulfide (H₂S) may cause burning or tearing and visual disturbances at repeated exposures above the TLV.

Inhalation: Prolonged or excessive exposure may cause irritation to the nose, throat, lungs and respiratory tract and may lead to headache, nausea, drowsiness, fatigue, pneumonitis, pulmonary edema, CNS depression, coma and respiratory arrest.

Chronic Health Effects from Overexposures:

Skin and eye irritation. May affect the respiratory and central nervous systems.

Special Toxic Effects:

n-Hexane (CAS 110-54-3)

Target Organs – Excess exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesia of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone. Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) has resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Benzene (CAS 71-43-2)

Carcinogenicity: Benzene is a known animal carcinogen and is known to produce leukemia in humans. Benzene has been identified as a human carcinogen by NTP, IARC and OSHA.

4 – FIRST AID MEASURES

- Ingestion:** Aspiration hazard. Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe damage. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration.
- Skin Contact:** Wipe material from skin and remove contaminated clothing. Cleanse affected areas thoroughly by washing with mild soap and water and, if necessary, a waterless skin cleanser. If irritation or redness develops, seek medical attention.
- Eye Contact:** If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water for 15 minutes, with eyelids held open. If symptoms persist, seek medical attention.
- Inhalation:** If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, qualified personnel should administer oxygen. Seek immediate medical attention.

Notes to Physician: Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of this material (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for development of cardiac arrhythmias.

5 – Exposure Controls/ Personal Protection

- Eye Protection:** Safety glasses or goggles are recommended when there is a possibility of splashing or spraying.
- Skin Protection:** The use of gloves (nitrile or neoprene) is advised to prevent skin contact and possible irritation. Depending on conditions, the use of an apron or chemical protective clothing may be necessary.
- Respiratory Protection:** A NIOSH certified air purifying respirator with an organic vapor cartridge may be used under conditions where airborne concentrations of hydrocarbons are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is a potential for an uncontrolled release, exposure levels are not known or any other circumstances where air purifying respirators

may not provide adequate protection. A respiratory protection program that meets US OSHA's 29 CFR 1910.134, Canadian Labour Code Part II and ANSI Z88.2 requirements must be followed when workplace conditions warrant a respirator's use.

Engineering Controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional ventilation or exhaust systems may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

6 – FIRE FIGHTING MEASURES

Flash Point:	< 40 °C	Lower Explosive Limit:	Not Established
Auto Ignition Temperature:	Not data available	Upper Explosive Limit:	Not Established

Basic Fire Fighting Procedures: Long-duration fires involving diluent stored in tanks may result in a boilover. The contents of the tank may be expelled beyond the containment dikes or ditches. All personnel should be kept back a safe distance when a boilover is anticipated (reference NFPA 11). For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces or when explicitly required by DOT, a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant. Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors. Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

Extinguishing Media: Any extinguisher capable of handling Class B fires is recommended, including extinguishing media such as CO₂, dry chemical or foam. Water spray is recommended to cool or protect exposed materials or structures. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Firefighting should be attempted only by those who are adequately trained and equipped with proper personal protective equipment.

Unusual Fire and Explosion Hazards: This material is flammable and may be ignited by heat, sparks, flames or other sources of ignition (such as static electricity, pilot lights, or mechanical/electrical equipment). Vapors may travel considerable distances to a source of ignition where they can ignite, flashback or explode. May create vapor/air explosion hazard indoors, outdoors or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

7 – ACCIDENTAL RELEASE MEASURES

Personal precautions: Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Eliminate all ignition sources.

Spill management: Wear appropriate breathing apparatus (if applicable) and protective clothing. A vapor suppressing foam may be used to reduce vapors. Try to work upwind of spill. Dike and contain land spills; contain water spills by booming. For large spills remove by mechanical means such as vacuuming or pumping and place in containers. All equipment used when

handling the product must be grounded. Recover and return free product to proper containers. Use suitable absorbent materials such as vermiculite, sands, soil, or clay to clean up residual liquids. Do not wash spills into sewers or other public water systems.

Reporting: Report spills to local or federal authorities as appropriate or required.

8 – HANDLING AND STORAGE

The use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Do not enter confined spaces such as tanks or pits without following proper entry procedures. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits.

Use appropriate grounding and bonding practices. Stores in properly closed containers that are appropriately labeled and in a cool well-ventilated area. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. Do not cut, drill, grind or weld on empty containers since they may contain explosive residues.

Harmful concentrations of hydrogen sulfide (H₂S) gas can accumulate in excavations and low-lying areas as well as the vapor space of storage and bulk transport compartments. Stay upwind and vent open hatches before unloading.

Avoid skin contact. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water.

9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear to brown liquid
Physical Form:	Liquid
Substance type (Pure/Mixture):	Mixture
Boiling Temperature:	94 to 1330 °F
Melting Temperature:	Not determined
Vapor Pressure:	about 7.47 psi
Vapor Density:	1.0 - 3.9
Evaporation Rate:	(Ethyl ether =1) >1
Specific Gravity:	0.82
Water Solubility:	Negligible
pH:	Not determined
Viscosity:	5.43 mm ² /s
Color:	Clear to brown
Odor:	Rotten egg, petroleum like odor

10 – STABILITY AND REACTIVITY

CONDITIONS TO AVOID:	Excessive heat, sources of ignition, sparks, open flames, and buildup of static electricity.
CHEMICAL STABILITY:	Stable at 70 °F, 760 mmHg pressure.
HAZARDOUS DECOMPOSITION PRODUCTS:	Combustion produces carbon monoxide, aldehydes, aromatic and other hydrocarbons.
HAZARDOUS POLYMERIZATION:	Will not occur
INCOMPATIBILITY:	Strong oxidizers such as nitrates, chlorates, peroxides.

11 – TOXICOLOGICAL INFORMATION– CHRONIC AND ACUTE HEALTH HAZARDS

This product contains aliphatic naphthas at a level of >0.1%. Lifetime skin painting studies in mice with similar naphthas have shown wither negative or very weak dermal carcinogenic activity following prolonged and repeated skin contact. Some other petroleum fractions that show carcinogenic activity when tested at nonirritating dose levels did not show any significant carcinogenic activity indicating that this tumorigenic response is likely related to chronic irritation and not dose. Some components of aliphatic naphthas, i.e., paraffins and olefins, have been shown to produce a species specific, sex hormonal dependent kidney damage develops via the formation of alpha-2u-globulin, a mechanism unique to the male rat. Humans do not for alpha-2u-globulin; therefore, the kidney effects resulting from this mechanism are not relevant in humans.

This product contains benzene at a level of 0.1%. Repeated or prolonged exposure to benzene at concentrations in excess of the TLV may cause serious injury to blood-forming organs. Significant chronic exposure to benzene vapor has been reported to produce various blood disorders ranging from anemia to certain forms of leukemia (cancer) in man. Benzene produced tumors in rats and mice in lifetime chronic toxicity studies, but the response has not been consistent across species, strain, sex or route of exposure. Animal studies on benzene have demonstrated immune toxicity, chromosomal aberrations, testicular effects and alterations in reproductive cycles and embryo/fetotoxicity, but not teratogenicity.

Hydrogen sulfide gas (H₂S) is toxic by inhalation. Prolonged breathing of 50-100 ppm H₂S vapors can produce eye and respiratory tract irritation. Higher concentration (250-600 ppm) for 15-30 minutes can produce headache, dizziness, nervousness, nausea and pulmonary edema or bronchial pneumonia. Concentrations of >1000 ppm will cause immediate unconsciousness and death through respiratory paralysis. Rats and mice exposed to 80 ppm H₂S, 6 hrs/day, 5 days/week for 10 weeks, did not produce any toxicity except for irritation of nasal passages. H₂S did not affect reproduction and development (birth defects or neurotoxicity) in rats exposed to concentrations of 75-80 ppm or 150 ppm H₂S, respectively. Over the years a number of acute cases of H₂S poisoning have been reported. Complete and rapid recovery is the general rule. However, if the exposure was sufficiently intense and sustained causing cerebral hypoxia (lack of oxygen to the brain), neurologic effects such as amnesia, intention tremors or brain damage are possible.

This product may contain hexane at a level of >1.0%. Studies in laboratory animals have produced systemic toxicity in blood, spleen and lungs. Fetotoxicity has been observed at hexane concentrations that produced maternal toxicity. Long term exposure to high concentrations of hexane has been shown to cause testicular effects and nervous system damage.

This product may contain xylenes at a level of >1.0%. Gross overexposure or severe poisoning incidents in humans to xylenes has been reported to cause lung, liver, kidney, heart and brain damage as well as neurologic disturbances. Laboratory animals exposed to high dose of xylenes showed evidence of effects in the liver, kidneys, lungs, spleen, heart and adrenals. Exposure of pregnant rats, mice and rabbits during gestation to significant concentrations of xylenes produced maternal, fetal and developmental toxicity (skeletal retardation, cleft palate, and wavy ribs) generally at maternally toxic doses. These types of fetotoxic effects have been associated with maternal toxicity. Repeated inhalation of high xylene concentrations has shown impairment of performance abilities (behavioral tests) in animals and man. Xylenes produced a mild frequency hearing loss in rats subchronically exposed to high concentrations of xylenes.

12 – DISPOSAL INFORMATION

Container contents should be completely used and containers should be emptied prior to discard. Container could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum re-conditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities. This product, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA RCRA (40 CFR 261), Environment Canada, or other State, Provincial, and local regulations. If this product is classified as a hazardous waste, federal law

requires disposal at a licensed hazardous waste disposal facility. This product could also contain benzene at >0.5 ppm and could exhibit the characteristic of "toxicity" (D018) as determined by the toxicity characteristic leaching procedure (TCLP). This material could become a hazardous waste if mixed or contaminated with a hazardous waste or other substance(s). It is the responsibility of the user to consult federal, state and local waste regulations to determine appropriate disposal options.

13 – ENVIRONMENTAL INFORMATION

Spill or Release to the Environment: Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof equipment is recommended. Stay upwind and away from spill/release. Notify persons downwind of spill/release, isolate immediate hazard area and keep unauthorized personnel out. Product may release large amounts of flammable vapors (e.g., methane, ethane and propane) at or below ambient temperature depending on source and process conditions. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory equipment as conditions warrant. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems and natural waterways. Dike far ahead of spill for later recovery or disposal. Use foam on spills to minimize vapors. Spilled material may be absorbed into an appropriate absorbent material.

Notify fire authorities and appropriate federal, state (provincial) and local agencies. Immediate cleanup of any spill is recommended. If spill of any amount into navigable waters, notify appropriate federal, state (provincial) and local agencies.

Sara Title III Information: This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:

Toluene	CAS – 108-88-3	Weight % - 0 – 2%
n-Hexane	CAS – 110-54-3	Weight % - up to 11%
Benzene	CAS – 71-43-2	Weight % - 0 – 2%

14 – REGULATORY INFORMATION

USA: All of the components of this product are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

Canada: All the components of this product are on the Canadian Domestic Substances List (DSL), or have been notified under the New Substances Notification Regulations, but have not yet been published in the Canada Gazette.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Classification: Class B2 Flammable Liquids
Class D2B Other Toxic Effects - Skin Irritant
Class D2A Other Toxic Effects – Embryotoxic/Fetotoxic

US EPA Reportable Quantity: The estimated reportable quantity (RQ) for this material is based on the weight % shown below:

RQ based on benzene – The RQ for benzene is 10 pounds, which equals 3,333 pounds of natural gas condensate (556 gallons). The RQ is based on 0.3 wt. % benzene.

RQ based on n-Hexane – The RQ for n-Hexane is 5000 pounds, which equals 50,000 pounds of natural gas condensate (8,333 gallons). The RQ is based on 10 wt. % n-Hexane.

RQ based on toluene – The RQ for toluene is 1000 pounds, which equals 50,000 pounds of natural gas condensate (8,333 gallons). The RQ is based on 2 wt. % toluene.

15 – SPECIAL PRECAUTIONS / SUPPLEMENTAL INFORMATION

Keep containers tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces and all sources of ignition. Post area "No Smoking or Open Flame". Store only in approved containers. Keep away from any incompatible material. Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet US OSHA standards, Canadian Labour Codes and other appropriate fire codes.

Depending on the source of natural gas condensate, there could be some amount of NORM (naturally occurring radioactive materials) in the scale, deposit and sludge associated with this material. Proper measurements should be taken prior to handling this material or any equipment contaminated with this material. If NORM is indicated, refer to API Bulletin E2, "Bulletin on Management of Naturally Occurring Radioactive Materials in Oil and Gas Production," for additional information.

Empty Containers: "Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged and promptly shipped to the supplier or a drum re-conditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1 and other governmental and industrial references pertaining to cleaning, repairing, welding or other contemplated operations.

16 – TRANSPORTATION REQUIREMENTS

General Transportation Information:

DOT Proper Shipping Name (49 CFR 172.101):	Petroleum Crude Oil
DOT Hazard Classes (49 CFR 172.101):	3
UN/NA Code (49 CFR 172.101):	UN1267
Packing Group (49 CFR 172.101):	II
Bill of Lading Description (49 CFR 172.202):	Petroleum Crude Oil
DOT Labels Required (49 CFR 172.101):	Flammable Liquid

Please note that the actual shipping name and associated data can vary due to the properties of the product. Other acceptable shipping names may include Petroleum Distillate n.o.s. 1268, Gasoline UN1203, Flammable liquids, n.o.s. (pentane) UN1993 or Hydrocarbons, Liquid n.o.s. (condensate) UN3295.

PREPARED BY: Enbridge Pipelines Inc.

Disclaimer

The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet (MSDS). However, MSDS's may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices or from any hazards inherent in the nature of the product.

ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
ASTM	American Society for Testing and Materials
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
HMIS	Hazardous Materials Identification System
IARC	International Agency for Research on Cancer
m ³	Cubic meter
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
n.o.s.	Not Otherwise Specified
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
REL	Recommended Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average

7852.2300 LAND REQUIREMENTS

For the proposed pipeline, the applicant shall provide the following information:

A. permanent right of way length, average width, and estimated acreage:

The Sandpiper Pipeline Project preferred route, to the extent practicable, is co-located with EPND's existing right-of-way or other utility rights-of-way in Minnesota. In Minnesota, the preferred route follows the EPND System beginning at the North Dakota border south of Grand Forks, North Dakota in Polk County and extending east to Clearbrook, Minnesota. At Clearbrook, the preferred route then turns south and generally follows the existing Minnesota Pipe Line Company right-of-way to a point near Hubbard, Minnesota. From Hubbard, the preferred route turns east, following parts of existing third-party rights-of-way where practicable, to the Wisconsin border abutting Carlton County, Minnesota. The preferred route in Minnesota traverses approximately 299 miles.

Right-of-Way Requirements – West of Clearbrook

From the North Dakota border to the Clearbrook Terminal, the Project will generally be constructed and installed adjacent to the existing EPND right-of-way. Typically, the right-of-way requirements in upland areas include up to 55-feet of permanent easement, of which 25-feet would be new easement and 65-feet of temporary workspace, for a total land requirement of 120-feet. In wetland areas, the temporary workspace requirement would be reduced to 40-feet, for a total land requirement of 95-feet.

EPND's design configuration and anticipated construction execution methods are intended to take advantage of the proximity of the Project to the existing EPND pipeline west of Clearbrook to minimize new right-of-way requirements.

Typical drawings depicting the construction footprint from the North Dakota border to Clearbrook in upland and wetland areas are included in Appendix F of the EIR.

Right-of-Way Requirements – East of Clearbrook

From Clearbrook, Minnesota to the Wisconsin border, the preferred route will follow a portion of the Minnesota Pipe Line Company right-of-way and parts of existing electrical transmission and railroad lines. Where co-location is not practicable, the pipeline will, by necessity, be constructed in greenfield areas. For both co-located and greenfield areas, this typically results in a construction footprint of 120-feet for standard pipeline construction in upland

areas, including 50-feet of permanent easement and 70-feet of temporary workspace. In wetland areas, the temporary workspace requirement would be reduced to 40-feet, for a total land requirement of 95-feet. Both the permanent easement and the temporary workspace areas may be returned to pre-existing uses by the landowners if they do not impact safe operation and inspection of the pipelines.

Typical drawings depicting the construction footprint from Clearbrook to the Wisconsin border in upland and wetland areas, whether parallel to third-party rights-of-way or in greenfield locations are included in Appendix F of the EIR.

In certain limited areas, the right-of-way encounters environmental features (such as extended wetlands) that require special construction methods. Typically, this results in a maximum construction footprint of 95-feet, including 50-feet of permanent easement and 45-feet of temporary workspace. EPND has presently identified approximately 9 miles of potential right-of-way in the following areas that contain environmental features that will necessitate these special construction methods:

- Milepost 395 to 396
- Milepost 415 to 416
- Milepost 460 to 462
- Milepost 484 to 485
- Milepost 496.5, 520, 546 and 555
- Milepost 558 to 562

B. temporary right-of-way (workspace) length, estimated width, and estimated acreage:

The Project will be constructed using a 120-foot-wide construction right-of-way consisting of existing or new easements. Approximately 65- to 70-feet of the 120-foot right-of-way will consist of temporary work space. Additional temporary workspace of up to 100-feet in width and 200-feet in length will be required at feature crossings (e.g., roads and waterbodies). For the 299-mile-long portion of the preferred route that will cross Minnesota, construction will affect approximately 5,137 acres of land (see Table 4.2-1 of the EIR). Access roads and pipeyards known as of the date of this filing are presented in Tables 1.2.3-1 and 1.2.2-1 of the EIR, respectively.

C. estimated range of minimum trench or ditch dimensions including bottom width, top width, depth, and cubic yards of dirt excavated:

Trenches will be dug using a trackhoe or crawler-mounted wheel type ditching machine. Typical trench dimensions are included in Table 7852.2300-C. The total excavation will comprise approximately 1.35 million cubic yards of soil for the Project.

	24-inch outside diameter pipe	30-inch outside diameter pipe
Minimum ditch depth to allow for a minimum of 36-inches of ground cover to the top of the pipe	60-inches	66-inches
Trench width at the bottom	3-feet	4-feet
Trench width at the top	4-feet	5-feet

D. minimum depth of cover for state and federal requirements:

In accordance with federal requirements (49 Code of Federal Regulation (“C.F.R.”) Part 195.248), the depth of cover between the top of the pipe and the ground level, road bed, or river bottom will range between 36- to 48-inches, depending on the location of the pipe and the presence of rock.

State law requires that a minimum depth of cover of 54-inches be maintained in cultivated areas unless waived by the landowner.

In locations where Sandpiper is co-located with adjacent pipelines that are buried in accordance with federal requirements, both safety and land use considerations have led EPND to propose the installation with a minimum 36-inch depth of cover. This approach will:

- minimize the amount of soil excavated and, therefore, reduce the total acreage temporarily impacted, and will decrease the loss of soil productivity through erosion;
- create no additional limits on deep plowing;
- facilitate crossings of pipelines at similar depths by other facilities; and
- alleviate the potential for existing lines to subside during installation of the new pipelines by installing new lines at close to the same elevation.

To implement the proposed depth of installation, where necessary, landowners will be asked to waive the 54-inch minimum cover requirement, as was done during the 1994, 1998, 2002, and 2010 Enbridge expansion projects.

E. right-of-way sharing or paralleling: type of facility in the right-of way, and the estimated length, width, and acreage of the right-of-way:

West of Clearbrook, the Project will generally be constructed within and/or adjacent to existing EPND right-of-way and parallel to existing facilities described in Section 7852.2100 Subpart 4.D. East of Clearbrook, the preferred route often parallels railroads, pipelines, highways, and other utilities and is crossed by such facilities.

7852.2400 PROJECT EXPANSION

If the pipeline and associated facilities are designed for expansion in the future, the applicant shall provide a description of how the proposed pipeline and associated facilities may be expanded by looping, by additional compressor and pump stations, or by other available methods.

As described in Sections 7852.2100 and 7852.2200, the annual capacity of the Sandpiper Pipeline Project for the transportation of light crude oil is 225,000 bpd from the North Dakota border to Clearbrook, Minnesota and 375,000 bpd from Clearbrook, Minnesota to the Wisconsin border. In addition to the new pipeline, the Project involves adding a new terminal with two 150,000 bbl tanks and a new pump station near Clearbrook, Minnesota.

EPND has designed the Project to facilitate capacity expansions in the future should shippers request the ability to move additional volumes in excess of the capacities requested in this application. The Project has been designed for an ultimate design capacity of 406,000 bpd (365,000 bpd annual capacity) from the North Dakota/Minnesota border to Clearbrook, Minnesota. From Clearbrook, Minnesota to the Minnesota/Wisconsin border the pipeline has been designed for an ultimate capacity of 711,000 bpd (640,000 bpd annual capacity). The increases in capacity to the ultimate design capacity would be achieved through the addition of new pumping units along the right-of-way. The pipeline will be designed, constructed, and hydrostatically tested for operation at the ultimate design capacity.

7852.2500 RIGHT-OF-WAY PREPARATION PROCEDURES AND CONSTRUCTION ACTIVITY SEQUENCE

Each applicant shall provide a description of the general right-of-way preparation procedures and construction activity sequence anticipated for the proposed pipeline and related facilities.

First, the right-of-way is surveyed, staked, and prepared for clearing. The right-of-way is then cleared and graded, as necessary, to provide construction access and safe movement of both equipment and personnel during construction. Silt fence and other erosion control measures are installed, and sensitive areas are marked for avoidance. Appropriate safety measures are implemented before excavation begins, including notification of the One-Call system to ensure third-party utilities and any adjacent pipelines are properly marked. Pipe, valves, and fittings are transported to the right-of-way by truck and placed along the right-of-way by side boom tractors or mobile cranes.

After individual pipe sections are strung along the right-of-way, they are bent to conform to the contours of the trench and terrain. The pipe segments are lined up, clamped, welded, field coated, and inspected. Trenching may occur before or after the pipe has been welded. Trenching is typically conducted using a backhoe or a crawler-mounted, wheel-type trenching machine. Where appropriate, topsoil is segregated according to applicable permit conditions. Prepared pipe is lowered into the trench and, where applicable, tied into existing facilities. During backfilling, subsoil is replaced first and then the topsoil is replaced. Precautions, such as padding the trench with soil, are taken during backfilling to protect the pipe from rock damage.

Once the pipeline has been welded and inspected, and the trench has been backfilled, the pipeline is hydrostatically tested to ensure its integrity prior to the line being filled with crude oil and placed into service. The right-of-way is then cleaned up and restored to preconstruction conditions, as practicable. Restoration includes implementing temporary and permanent stabilization measures such as slope breakers, mulching and seeding.

Section 1.3 of the EIR provides a detailed description of construction activities along with a diagram depicting the typical construction sequence.

7852.2600 PREFERRED ROUTE LOCATION; ENVIRONMENT DESCRIPTION

Subpart 1. Preferred route location.

The applicant must identify the preferred route for the proposed pipeline and associated facilities, on any of the following documents which must be submitted with the application:

- A. United States Geological Survey topographical maps to the scale of 1:24,000, if available;
- B. Minnesota Department of Transportation county highway maps; or
- C. aerial photos or other appropriate maps of equal or greater detail in items A and B. The maps or photos may be reduced for inclusion in the application. One full-sized set shall be provided to the commission.

U.S. Geological Survey ("USGS") topographical maps and aerial photo maps for the preferred pipeline route from the North Dakota state line in Polk County, Minnesota to the Wisconsin state line in Carlton County, Minnesota are included in Appendix G.5 of the EIR.

Subpart 2. Other route locations.

All other route alternatives considered by the applicant must be identified on a separate map or aerial photos or set of maps and photos or identified in correspondence or other documents evidencing consideration of the route by the applicant.

EPND studied a variety of routes for the preferred pipeline. The study consisted of the no-action alternative, system alternatives, and route alternatives. To be considered viable, an alternative had to meet three factors: ability to meet project objectives; technical and economic feasibility; and have significant land use compatibility and environmental advantage over the preferred route.

Section 2.0 of the EIR provides a detailed analysis of the alternatives considered and Section 7852.3100 of this application provides a summary of this analysis.

Subpart 3. Description of environment.

The applicant must provide a description of the existing environment along the preferred route.

EPND prepared an Environmental Information Report for the Project that provides a description of the existing environment and socioeconomic conditions along the preferred route, an analysis of potential human and environmental impacts, and a discussion of measures that will be taken to minimize or mitigate adverse impacts and protect and restore the right-of-way. A summary of the existing environmental conditions along the preferred route is provided below. A summary of potential environmental impacts and mitigation measures is provided in Section 7852.2700 of this application.

Socioeconomics

County population levels within the project area range from 4,087 persons in Red Lake County to 62,882 persons in Crow Wing County. In general, population levels are low in these counties. Population densities (an indicator of the extent of development) in the counties affected by the project averages 22.9 people per square mile. All county-level population densities along the preferred route are lower than the Minnesota average of 66.6 people per square mile, reflecting the generally rural character of much of the preferred route. The April 2013 unemployment rates in the project area varied from 5.3 percent in Polk County to 15.2 percent in Clearwater County (compared to a statewide average of 5.4 percent). Employment in the project area is concentrated in the following sectors: education, health, and social services, retail trade, manufacturing, arts, entertainment, recreation, accommodation and food services, and construction industries. Education, health and social services, retail trade and manufacturing are the top employment industries in the counties crossed by the preferred route. Per capita income in 2011 ranged from \$22,408 in Red Lake County to \$25,645 in Crow Wing County. In general, per capita income is lowest in rural counties with low population densities and high unemployment rates, and highest in urban counties with high population densities and low unemployment rates. Five municipalities are located within approximately one mile of the preferred route and no municipal boundaries would be crossed by the preferred route (see Table 3.1-2 of the EIR).

Section 3.0 of the EIR provides additional details regarding socioeconomic conditions.

Land Use

Using the USGS Land Use and Land Cover Classification System, EPND identified land use along the preferred route (including the construction right-of-way and known additional temporary workspaces) and classified it into the following five categories based on prevalent land use and vegetation cover

types: agricultural lands, developed lands, forest lands, open lands, and wetlands/open water. The predominant land use identified along the preferred route is forested land, which accounts for 1,946 acres (or 38 percent) of the total construction area. Agricultural land accounts for 1,761 acres (or 34 percent) of the total construction area. Of the agricultural land affected, approximately 60 percent is cultivated and the remaining 40 percent is pasture land. Other land uses are wetland/open water (824 acres or 16 percent), open land (590 acres or 12 percent), and developed land (15 acres or less than 1 percent) (see section 4.2 of the EIR).

The land use categories that will be affected resulting from the siting of the new Clearbrook terminal facilities include agricultural land (78 acres or 85 percent), wetland (7 acres or 7 percent), forested land (4 acres or 4 percent), and open land (3 acres or 3 percent). The land use categories that will be affected resulting from the siting of the Pine River facility will be forest land (10 acres or 98 percent of the site) and open space (less than 1 acre or 2 percent of the site).

The preferred route predominantly crosses private land (229 miles or approximately 77 percent of the route). The preferred route also crosses state lands (26 miles or approximately 9 percent of the route) and county lands (44 miles or approximately 15 percent of the route) (see section 4.2.1 of the EIR).

Section 4.0 of the EIR provides details regarding land use.

Terrain and Geology

The Project primarily traverses the Interior Plain Physiographic Province, crossing into the Laurentian Upland Province—Superior Upland in the eastern portion of its route in Minnesota. The geologic terrain of both of these provinces is characterized by ancient pre-Cambrian igneous and metamorphic rocks that have been uplifted and eroded to a relatively low-relief plain, forming the stable geologic core of the North American continent, known as the craton. The North American craton, which is crossed by the Project, has been tectonically stable for over 500 million years. Therefore, there is a low probability of an earthquake of significant intensity or other seismic event in the Project area.

Maps of regional coverage of depth-to-bedrock generally are not of sufficient resolution to identify areas where bedrock occurs at specific depths; therefore, information on depth to bedrock in a specific location is difficult to determine without sampling. Generally, the depth to bedrock along the preferred route can exceed more than 450-feet. Less than 1 percent of the route (from approximate milepost (“MP”) 579.5 to MP 582.0 in Carlton County) crosses an area of more or less continuous bedrock exposure (see section 5.1 of the EIR). Blasting may be required if bedrock is encountered

within the depth of the trench.

Nineteen sand and gravel quarry operations are present within 1,500-feet of the construction workspace. Four areas of active metallic mineral leases on state lands are present within 1,500-feet of the construction workspace, and three active leases will be crossed by pipeline construction in Aitkin and Carlton counties (see section 5.1.1 of the EIR).

Section 5.0 of the EIR provides details regarding geological resources.

Soils

The preferred route will cross the following Major Land Resource Areas: Red River Valley of the North; Northern Minnesota Gray Drift; Rolling Till Prairie; Northern Minnesota Glacial Lake Basins; Superior Lake Plain; Central Minnesota Sandy Outwash; and Wisconsin and Minnesota Thin Loess and Till, Northern part. Soils in these areas range from somewhat poorly drained soils with loamy and clayey textures to sandy soils that are well or excessively drained. Soils have a frigid temperature regime, an aquic or udic soil moisture regime, and mixed, smectitic, or isotic mineralogy.

Approximately 59 percent of the soils within the Project area are considered prime farmland, 37 percent are hydric, 23 percent are compaction-prone, 15 percent are susceptible to water erosion, 71 percent are susceptible to wind erosion, 39 percent pose re-vegetative concern, and less than 1 percent of the route crosses shallow bedrock (see section 6.2.2 of the EIR).

Section 6.0 of the EIR provides details regarding soil resources.

Vegetation, Wildlife, and Fisheries

Sandpiper will be constructed through multiple biomes, including deciduous forest, conifer forest, and prairie. Wildlife habitats within these areas are diverse and include open areas, wetlands, and forested areas.

Within agricultural areas, wildlife habitat is limited and confined primarily to the undeveloped areas. Common mammalian species, including white-tailed deer, woodchucks, striped skunks, raccoons, weasels, Virginia opossum, and various mice and voles, use these areas for feeding and cover. Common bird species, such as European starlings, American crows, eastern meadowlarks, and house sparrows, are also typically found in agricultural areas.

Forested areas affected by the project are found primarily along the eastern portion of the preferred route. Mammalian species include eastern chipmunks, black bears, snowshoe hares, gray squirrels, gray fox, porcupines, pine martens, and several species of bats.

Wetlands affected by the project consist primarily of emergent herbaceous

wetlands, woody 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 provide additional habitat for terrestrial wildlife, such as white-tailed deer, moose, gray wolves, black bears, and a variety of small mammals and songbirds.

Open land affected by the project consists primarily of shrub/scrub areas, grasslands, developed open space, and barren land. 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 the varied prey. Other common wildlife species that may use open areas include thirteen-lined ground squirrels, eastern cottontail rabbits, and white-tailed jackrabbits.

The preferred route crosses 73 perennial and 76 intermittent streams in Minnesota (see table 9.2-1 of the EIR). A list of waterbodies crossed by the Project is included in Appendix E of the EIR. Most of these waterbodies contain warm water fisheries. The preferred route also will cross 13 Minnesota Department of Natural Resources (“MNDNR”)-designated trout streams (see section 7.3.1 of the EIR). Game fish that may occur in stream crossings in the project area include bass, bullhead, catfish, crappie, muskellunge, perch, pike, sunfish, walleye, and trout.

The preferred route crosses four Wildlife Management Areas (“WMAs”) and two Aquatic Management Areas (“AMAs”) (see section 11.1.2 of the EIR).

EPND initiated consultation with the U.S. Fish and Wildlife Service (“USFWS”) to understand the potential presence of threatened and endangered species in the vicinity of the Project and establish approved survey protocols. EPND discussed the USFWS initial recommendations with USFWS staff over the phone and received an email with information on federally listed species in Minnesota. At the request of USFWS and pursuant to the federal process, further consultations will not proceed until a lead federal agency has been identified and the subsequent designation of EPND as the non-federal representative for the federal agency under the Endangered Species Act occurs.

EPND also initiated consultation with the MNDNR Endangered Species Review Coordinator to understand the potential presence of threatened and endangered species in the vicinity of the Project. EPND conducted a review of the Minnesota Natural Heritage Information in cooperation with the MNDNR to determine if any federally or state-listed species are known to occur within a 2-mile-wide study area centered on the preferred route. Results of the review are presented in Table 7.4.1-1 of the EIR.

Section 7.0 of the EIR provides detailed information about vegetation, wildlife, fisheries, and threatened and endangered species.

Water Resources – Groundwater

Groundwater along the preferred route occurs in surficial aquifers and buried drift aquifers. Surficial aquifers occur above bedrock in unconsolidated sediments deposited by glaciers, streams, and lakes. Buried drift aquifers occur in well sorted sands and gravels deposited in bedrock valleys, alluvial channels, and outwash plains. Of the two types, surficial aquifers are most susceptible to impacts from construction because of the relatively shallow depth of the water table and coarse texture of the material overlying the aquifer.

EPND identified 12 domestic water supply wells within 200-feet of the preferred route; one well was for a test hole and another was for an irrigation well. No public water supply wells were identified in the vicinity of the Project (see section 8.2.3 of the EIR). Current Minnesota Department of Health (“MDH”) regulations require a well isolation distance of 100-feet for petroleum pipelines (Minnesota Rules, Chapter 4725). The preferred route will not cross any aquifers that are designated by the US Environmental Protection Agency (“EPA”) as sole-source aquifers. The Project will cross about 0.2 miles of a Drinking Water Supply Management Area (“DWSMA”) in the vicinity of Park Rapids (see section 8.2.2 of EIR). The MDH rates the sensitivity of the aquifer that supplies the well for that water supply as “high”. EPND has initiated consultation with the operators of the DWSMA and the MDH regarding this crossing.

EPND accessed a Minnesota Pollution Control Agency (“MPCA”) database to identify sites with known or potential contamination within 0.5 mile of the preferred route. EPND identified 16 sites, and all were determined to be more than 500-feet from the preferred pipeline route and are not anticipated to be impacted by or impact the Project (see section 8.3 of the EIR). Following final route selection and prior to construction, EPND will re-assess the potential for encountering contaminated groundwater near sites that are within 500-feet of the final pipeline route. If necessary, appropriate avoidance or mitigation measures will be developed and implemented at that time in accordance with applicable state or federal regulations.

Section 8.0 of the EIR provides details regarding groundwater resources.

Water Resources – Surface Water

Surface waters crossed by the preferred route are located within the Red River of the North, Mississippi Headwaters, St. Croix River, and Western Lake Superior Basins. The Project will cross the Red Lake and Wild Rice Watershed Districts. The primary purpose of these watershed districts is to conserve the natural resources of the state through land use planning, flood

control, and other conservation practices.

EPND reviewed hydrographic spatial data coverage provided by the MNDNR to identify waterbodies (lakes, streams, rivers, and drainage ditches) crossed by the preferred route. This review identified 149 waterbodies crossed by the preferred route including 73 perennial streams and 76 intermittent streams. Of these waterbodies, 64 are designated as Public Waters by MNDNR (see table 9.2-1 of the EIR). The Project will cross 11 impaired streams in 15 different places (see section 9.2.1 of the EIR). Calcareous fens are designated as Outstanding Resource Value Waters (“ORVWs”) and are given special protection by state regulations. EPND’s wetland delineation surveys will aid in the identification of calcareous fens and other rare plant communities that may indicate the presence of a calcareous fen. EPND will continue to work with MNDNR regarding calcareous fens in the vicinity of the Project.

For routing and planning purposes, EPND used National Wetland Inventory (“NWI”) data combined with field survey data through August 11, 2013 to estimate the number, size, and locations of wetlands along the preferred route. Through a combination of NWI and field data, EPND determined that the preferred route will cross a total of 1,565 wetlands. This number does not distinguish between those wetlands that will be crossed more than once and will be further refined pending review of additional field data. A total of approximately 60.4 linear miles of wetlands will be crossed by the preferred route (see section 9.3.1 of the EIR). Of the wetlands crossed by the preferred route, five wetlands are listed on the MNDNR Public Waters Inventory. In addition, seven basins listed on the MNDNR Public Waters Inventory are crossed by the preferred route (see section 9.3.2 of the EIR).

Section 9.0 of the EIR provides details regarding surface water resources.

Cultural Resources

EPND reviewed the Minnesota State Historic Preservation Office’s (“SHPO”) site files to identify previously recorded cultural resources within a survey area with a width ranging from 250- to 450-feet. This review identified six previously recorded sites, two of which have been determined not eligible for listing on the National Register of Historic Places (“NRHP”). The four remaining sites have not been evaluated for eligibility. EPND is currently conducting Phase 1 reconnaissance surveys and utilizing a statistically-based Geographic Information System (“GIS”) predictive sensitivity model to identify cultural resources within the survey area. As of August 11, 2013, 23 archaeological sites have been identified, 17 of which reflect Pre-Contact Period occupations and consist of various assemblages of stone tools and tool-making debris, faunal (animal) remains, and pottery. Six locations reflect Historic Period occupations from the 19th and 20th centuries. As of August 11, 2013, no historic structures have been recorded within the survey area (see section 10.2 of the EIR).

Section 10.0 in the EIR provides details regarding cultural resources.

Federal, State, and County Recreational Areas

The preferred route will not cross any national parks, national forests, national landmarks, wilderness areas, wildlife refuges, waterfowl production areas, or national wildlife management areas. However, the preferred route will cross a National Scenic Trail and four Minnesota rivers that are listed on the National Rivers Inventory. None of these are federally designated as National Wild and Scenic River (see section 11.1.1 of the EIR).

Sandpiper will not cross any state parks or state scientific natural areas. However, the Project will cross state and county forests, county parks, state WMAs and AMAs, state-designated trails, designated scenic byways, and state-designated water trails/canoe routes (see section 11.1.2, 11.1.3, and 11.1.4 of the EIR).

Section 11.0 of the EIR provides details regarding federal, state and county recreational areas.

Air Quality

The Project will include the construction of additional external floating roof storage tanks at a new Clearbrook terminal facility adjacent to the existing EEP Clearbrook Terminal. Once constructed, the new tanks will be subject to federal New Source Performance Standards under 40 C.F.R. 60 Subpart Kb. Tank emissions will be controlled by the floating roof, rim seals, and deck fitting controls (such as gaskets, sleeves, and wipers). EPND will not be required to obtain an air permit prior to commencing construction activities at the Clearbrook Terminal. The Clearbrook Terminal currently operates under an "Option A" registration permit and will remain eligible for this permit after the Project. EPND will complete the required New Source Performance Standards notifications and submittals for the new storage tanks. Project related emissions at the new Clearbrook Terminal will be predominantly Volatile Organic Compounds ("VOC") and are estimated to be 24 tons of VOC/year (see section 12.3 of the EIR).

Construction of the pipeline and associated aboveground 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.

Section 12.0 of the EIR provides additional details regarding air quality.

7852.2700 ENVIRONMENTAL IMPACT OF PREFERRED ROUTE

The applicant must also submit to the commission along with the application an analysis of the potential human and environmental impacts that may be expected from pipeline right-of-way preparation and construction practices and operation and maintenance procedures. These impacts include but are not limited to the impacts for which criteria are specified in part 7852.0700 or 7852.1900.

EPND has prepared an EIR for the Sandpiper Pipeline Project that provides a description of the existing environment along EPND's preferred route, an analysis of potential human and environmental impacts, and a discussion of measures that will be implemented to protect and restore the right-of-way as well as mitigate adverse impacts. A summary of the potential human and environmental impacts is presented below. A summary of the existing environment along the preferred route is provided in Section 7852.2600 of this application. More detailed information on the human and environmental impacts as well as mitigating measures is provided in the EIR.

A. human settlement, existence and density of populated areas, existing and planned future land use, and management plans;

Population Levels and Density

Population densities (an indicator of the extent of economic development) in the counties affected by the Project average 22.9 people per square mile. All county-level population densities are lower than the Minnesota average of 66.6 people per square mile, reflecting the rural character of the preferred route. County population levels within the Project area range from a low of 4,087 persons in Red Lake County to a high of 62,882 persons in Crow Wing County. Most of the cities within one mile of the preferred route have populations of less than 3,000 persons (see section 3.1 of the EIR). The Project is not expected to add to population densities or total population levels in the affected counties due to the temporary nature of the construction workforce. In general, the preferred route avoids population centers and residential areas.

Section 3.0 of the EIR presents information on current population levels and density in the counties crossed by the preferred route.

Land Use

The total land requirements for Sandpiper generally include a 120-foot-wide construction right-of-way in upland areas and a 95-foot-wide construction right-of-way in wetland areas with additional temporary workspaces at feature crossings such as roads, waterbodies, railroads, sideslopes, and other special

circumstances. These additional temporary workspaces are construction areas that are required outside of the typical construction right-of-way to stage equipment and stockpile spoil material. Construction of the Minnesota portion of the Project (excluding facilities) will temporarily affect approximately 5,137 acres of land; this total does not account for EPND's plans to narrow the construction footprint ("neck-down") in wetland areas (see section 4.2 of the EIR).

EPND classified land use along the preferred route into the following five categories: forested land, agricultural land, developed land, open land, and wetlands/open water. Table 7852.2700-1 provides a summary of land use categories affected by pipeline construction and operation (also see section 4.2 of the EIR). Aboveground facilities at Clearbrook and Pine River will permanently impact approximately 10.0 acres of land.

	Acreage Affected by Construction		Acreage Affected by Operation	
	Acres	Percent	Acres	Percent
Forested	1,945.8	37.9	626.6	33.7
Agricultural	1,761.4	34.3	712.5	38.4
Developed	15.3	0.3	5.7	0.3
Open Land	590.0	11.5	225.9	12.2
Wetlands/Open Water	824.0	16.0	286.0	15.4
Total	5,136.5	100.0	1,856.6	100.0

Pipeline construction activities may interfere with planting or harvesting, depending on the timing of construction. Impacts on agricultural areas will be minimized by implementation of EPND's Agricultural Protection Plan ("APP") (Appendix C to the EIR).

Pipeline construction may result in impacts on residential and commercial areas but these impacts will generally be short-term. These short-term impacts could include dust generated from construction equipment and excavation, increased ambient noise levels, and increased vehicular traffic.

To facilitate installation of the pipeline, trees and brush will be removed from the construction right-of-way and additional temporary workspaces. Following construction, the right-of-way will be restored and revegetated. Consistent with

standard industry practices, the new permanent right-of-way in forest lands will be maintained in an herbaceous state to facilitate aerial inspection of the pipeline; however, the remainder of the construction right-of-way and the additional temporary workspaces will be allowed to revert to their natural forested state.

Open land consists of areas classified as bare rock, sand, or clay; quarries, strip mines or gravel pits; transitional; shrublands; grasslands or herbaceous areas; cleared portions of existing rights-of-way; and urban or recreational grasses. Open lands will be temporarily disturbed during grading, trenching, backfilling, and restoration. Once construction is complete, open land will be restored and revegetated.

EPND will reduce the construction workspace width to 95-feet in wetlands to reduce impacts on these areas; therefore, this acreage is overrepresented. Following construction, wetlands will be allowed to revegetate naturally.

Sandpiper will cross two watershed districts and eight counties where comprehensive land use plans have been established. These are the Wild Rice and Red Lake Watershed Districts; and Polk, Red Lake, Clearwater, Hubbard, Cass, Crow Wing, Aitkin, and Carlton counties. It is expected that the Project will be consistent with these land use plans. EPND has initiated consultations with affected watershed districts and counties to ensure that the Project is designed and constructed in a manner that minimizes impacts on the land use objectives for these areas.

Section 4.0 of the EIR presents information on land use.

B. the natural environment, public and designated lands, including but not limited to natural areas, wildlife habitat, water, and recreational lands;

Vegetation, Wildlife, and Fisheries

During construction, existing vegetation will be removed from within the construction right-of-way and temporary workspace areas to facilitate the installation of the pipeline. The impact of clearing and the time required to achieve recovery of vegetation communities will depend on the size and age of the pre-existing vegetation. Active revegetation measures and rapid colonization by annual and perennial herbaceous species in the disturbed areas will restore most vegetative cover within the first growing season. In general, long-term impacts will be greatest in forest lands because forest

vegetation is more structurally complex than other vegetation types and takes longer to re-establish naturally.

Impacts on vegetation adjacent to the Project area will be minimized through adherence to soil erosion control specifications, by confining clearing activities to the approved right-of-way and additional temporary workspaces, and by implementing revegetative measures in accordance with EPND's Environmental Protection Plan ("EPP") (Appendix A to the EIR). Where the preferred route parallels existing pipeline rights-of-way, construction areas will overlap the existing maintained right-of-way, thereby reducing the amount of forest and shrub lands that will be cleared for construction.

Operation and maintenance of the pipeline facilities will have additional effects on vegetation after site clearing and right-of-way restoration are complete. To facilitate inspection of the pipeline, the permanent right-of-way periodically will be cleared of trees and shrubs to facilitate aerial inspection of the pipeline and maintain visibility of pipeline markers, which will be located at property lines and crossings of roads and waterbodies.

Construction and operation of the Project is not expected to have a significant impact on wildlife. Temporary impacts will occur during construction due to clearing of vegetation and disturbance of soils in the right-of-way. Most wildlife will disperse from the Project area as construction activities approach. Displaced species may recolonize in adjacent, undisturbed areas, or re-establish in their previously occupied habitats after construction is complete and suitable habitat is re-established. Long-term impacts will be limited to a loss of forest habitat due to clearing of the temporary construction right-of-way and additional temporary workspaces that are located in forested areas.

Construction will result in temporary impacts on streams, including trout streams and AMAs, crossed by the pipeline. Some potential impacts on fisheries resources, such as sedimentation and turbidity, removal of stream bank cover, introduction of water pollutants, or entrainment and impingement of aquatic organisms could result from construction activities. Overall, impacts from construction on fish and other aquatic organisms are expected to be localized and temporary. To minimize the potential for adverse impacts on the fisheries at river and stream crossings, EPND will implement erosion and sediment control measures specified in the EPP (Appendix A of the EIR) and limit the duration of construction in these waterbodies. EPND will continue to

consult with MNDNR regarding crossings of trout streams, AMAs, WMAs, and other sensitive waterbodies and wildlife areas.

EPND has initiated consultation with USFWS and MNDNR on the presence of threatened and endangered species in the vicinity of the Project. EPND will continue to consult with the USFWS and MNDNR on the status of mitigative strategies for these species. If any of the species are identified in the construction right-of-way during surveys, EPND will work with the appropriate agency to develop mitigation plans to avoid and minimize impacts on the potentially affected species.

Section 7.0 of the EIR presents information on vegetation, wildlife and fisheries.

Terrain and Geology

EPND will minimize impacts by restoring contours to pre-construction conditions to the extent practicable and by implementing the erosion control measures described in its EPP (see Appendix A to the EIR). Less than one percent of the preferred route crosses areas with bedrock exposure and these bedrock exposures are limited to Carlton County. Blasting or other methods for construction in bedrock may be employed. Any sand, gravel, or metallic mineral deposits located in the operational right-of-way will be unavailable for mining after installation of the pipeline. EPND will continue to work with the MNDNR, private exploration companies, and affected counties regarding crossings of active mineral leases on state and county lands.

Section 5.0 of the EIR presents information on terrain and geology.

Soils

Pipeline construction activities such as clearing, grading, trench excavation, and backfilling, as well as movement of construction equipment along the right-of-way may result in impacts on soil resources. EPND will minimize or avoid these impacts on soils by implementing the mitigation measures described in the EPP and APP (Appendices A and C, respectively, to the EIR).

These measures will include topsoil segregation, compaction alleviation, removal of excess rock, restoration of agricultural drainage systems, and the installation of temporary and permanent erosion control structures. EPND will also revegetate disturbed areas, with the exception of active cropland, following final grading.

Section 6.0 of the EIR presents information on soils.

Water Resources – Groundwater

Construction of the Project is not expected to have long-term impacts on groundwater resources. Ground disturbance associated with pipeline construction is primarily limited to the upper 10-feet, which is above the water table of most of the regional aquifers.

The introduction of contaminants to groundwater due to accidental release of construction related chemicals, fuels, or hydraulic fluid could have an adverse effect on groundwater quality, most notably near shallow water wells. EPND's EPP (Appendix A to the EIR) describes measures that will be implemented to prevent accidental releases of fuels and other hazardous substances. The EPP also outlines response, containment, and cleanup procedures. By implementing the protective measures set forth in the EPP, long-term contamination due to construction activities is not anticipated.

Section 8.0 of the EIR presents information on groundwater.

Surface Water Resources

Pipeline construction across rivers and streams can result in temporary and long-term adverse environmental impacts if not mitigated. Temporary impacts from in-stream trenching could include an increase in the sediment load downstream of the crossing location. Sustained periods of exposure to high levels of suspended solids have been shown to cause fish egg and fry mortality and other deleterious impacts on fisheries and other aquatic resources. Surface runoff and erosion from the cleared right-of-way also can increase in-stream sedimentation during construction resulting in the shallowing of pools and a reduction of the quality of spawning beds and benthic substrate. EPND's proposed waterbody construction methods, specifically with respect to erosion control, bank stabilization, and bank revegetation, will minimize short- and long-term impacts on the waterbodies along the preferred route.

EPND will avoid and minimize impacts on waterbodies by implementing the erosion and sediment control measures described in the EPP (Appendix A of the EIR). EPND will limit the duration of construction within waterbodies and limit equipment operation within waterbodies to the area necessary to complete the crossing. Disturbed areas at crossings will be restored and stabilized as soon as practicable after pipeline installation.

Alternative construction techniques (such as horizontal directional drill ("HDD") or dry crossing methods) may be used at selected waterbodies to avoid and minimize impacts on these waterbodies. The HDD method is a well-

established construction technique for installing a pipeline under large (i.e., wide and deep) waterbodies that avoids impacts associated with conventional open-cut methods. However, HDD installations have the potential to affect waterbodies through inadvertent drilling mud release during construction. If HDDs are used to cross waterbodies, EPND will follow the provisions of its EPP to attempt to prevent an inadvertent drilling mud release or to minimize environmental effects caused therefrom.

Releases from refueling operations, fuel storage, or equipment failure in or near a waterbody could affect aquatic resources and contaminate the waterbody downstream of the release point. EPND will minimize the potential impact of a hazardous material release by adhering to the relevant provisions in its EPP.

Section 9.0 of the EIR presents information on surface water.

Federal, State, and County Recreational Areas

Construction and operation of the pipeline is not expected to have significant impacts on recreational lands. In Minnesota, more than 70 percent of the preferred route will be constructed within or generally adjacent to existing third-party rights-of-way, which will minimize potential impacts on public lands and recreational areas. Sandpiper will have only minor and temporary impacts on public recreational areas, primarily limited to temporary inconveniences and localized disturbances. There will be no long-term impact on recreational activities within the public lands areas as a result of construction and operation of the pipeline. Vegetation maintenance could have limited visual impacts on public lands that are densely forested.

Project construction could temporarily restrict public use of recreational areas depending on the timing of construction, the season in which the recreational activity occurs, and the construction methods used. Public access to state and county lands, including foot trails, will be maintained to the greatest extent possible during construction. After construction is completed, the public lands will be restored to allow previous uses and recreational activities to continue.

Boating and recreational use of the waterbodies crossed by the Project may be temporarily affected during construction. Depending on the crossing method used, impacts on recreational users may include construction noise, downstream turbidity, or temporary obstructions at the crossing location.

EPND will continue to coordinate with agencies regarding crossing of federal, state and county land.

Section 11.0 of the EIR presents information on recreational areas.

Air Quality

EPND will not be required to obtain an air permit prior to commencing construction activities at the Clearbrook Terminal. The Clearbrook Terminal currently operates under an "Option A" registration permit and will remain eligible for this permit after the Project. EPND will complete the required New Source Performance Standards notifications and submittals for the new storage tanks (see section 12.3 of the EIR). Project related emissions at the new Clearbrook Terminal will be predominantly VOCs and are estimated to be 24 tons of VOC/year. Particulate emissions from the new Clearbrook Terminal will not increase as a result of the Project.

Emissions from construction are not expected to cause or significantly contribute to a violation of an applicable ambient air quality standard due to construction equipment being operated on an as-needed basis, primarily during daylight hours. Emissions from the gasoline and diesel engines would be minimized as 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). In addition, the EPA requires that the maximum sulfur content of diesel fuel for highway vehicles be reduced from 500 parts per million by weight ("ppmw") to 15 ppmw in mid-2006, making lower sulfur diesel available nationwide.

EPND's EPP (Appendix A of the EIR) specifies that the contractor would take all reasonable steps to control dust near residential areas and other areas as directed by EPND, in order to minimize dust generated from construction activities. 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. The use of dust suppression techniques would minimize fugitive dust emissions during construction of the Project, thereby minimizing potential air quality impacts on nearby residential and commercial areas.

Section 12.0 of the EIR presents information on air quality.

C. lands of historical, archaeological, and cultural significance;

EPND initiated consultation with the appropriate land managing and oversight agencies regarding impacts to cultural resources for the preferred route. EPND reviewed the Minnesota SHPO's site files to identify previously recorded cultural resources and previously completed studies within the Project area, that is, the Preferred route and known facilities, storage yards, ancillary facilities, and access roads. This review identified six previously recorded sites, two of which have been determined not eligible for listing on the NRHP. The remaining sites have not been evaluated for eligibility. Sites that have not been evaluated would require additional review if they will be impacted by Project activities (see section 10.1 of the EIR).

EPND is completing cultural resources Phase I reconnaissance surveys and a GIS predictive sensitivity model for the Project area. Surveys will attempt to determine the location of previously recorded sites, and will document unrecorded sites. EPND will evaluate all sites regarding NRHP eligibility, and provide treatment plans for those sites that are NRHP listed or eligible for listing and will be impacted by the Project. EPND prefers to avoid recorded or unrecorded sites and may resort to: minor route deviations around identified sites: installing the pipeline beneath the site using conventional bore or HDD technology; and/or fencing sites or portions of sites to ensure that they are not disturbed during construction. If avoidance is not possible, EPND will work with the consulting agencies to design other mitigation, such as data recovery, for sites.

In addition, EPND has developed an Unanticipated Discoveries Plan (Appendix D of the EIR) which will be implemented in the event that a previously undocumented cultural (or paleontological) resource site is discovered during construction activities. The Unanticipated Discoveries Plan requires that any find be examined and documented by an archaeologist, and that EPND consult with the appropriate authorities and agencies. Work at the location of any cultural site will not resume until the find is properly analyzed and its treatment resolved. The measures in the Unanticipated Discoveries Plan are designed to avoid impacts to sites eligible for listing on the NRHP.

Section 10.0 of the EIR presents information on cultural resources.

D. economies within the route, including agricultural, commercial or industrial, forestry, recreational, and mining operations;

Per capita income in 2011 ranged from a low of \$22,408 in Red Lake County to a high of \$25,645 in Crow Wing County. The April 2013 unemployment rates in the Project area varied from 5.3 percent in Polk County to 15.2 percent in Clearwater County (compared to a statewide average of 5.4 percent). Employment in the Project area is concentrated in the following areas: education, health and social services; retail trade; manufacturing; arts, entertainment, recreation, accommodation and food services; and construction industries (see section 3.1 of the EIR).

EPND anticipates that the Project will provide temporary beneficial impacts on the local economy during construction. Using the Regional Input-Output Modeling System¹ as developed and maintained by the United States Department of Commerce, Bureau of Economic Analysis, EPND estimates that approximately 17,315 person-years² of temporary construction jobs will be created for the duration of construction. EPND, through construction contractors and subcontractors, will hire local workers where the local workforce possesses the required skills. Construction personnel hired from outside the Project area will augment the local workforce and consist of supervisors, environmental inspectors, and highly skilled mechanical, electrical, and instrumentation/control tradesmen. Non-local workers will relocate to the Project area for the duration of construction. All workers will generally be dispersed along the length of the construction right-of-way rather than concentrated at a single work site. Non-local workers will reside in the vicinity of the Project for short periods, typically unaccompanied by family members.

Construction and operation of the Project will benefit local economies through expenditures for wages, purchase of materials, and annual taxes. Construction will create temporary jobs for both local and non-local workers. Operation of the Project will likely require EPND to hire additional new full-time permanent employees.

Section 3.0 of the EIR presents information on current per capita income, workforce, unemployment rates, and industry in the counties crossed by the preferred route.

¹ <http://www.bea.gov/regional/rims/>

² Person-year is the equivalent of one-person working full-time for one year.

E. pipeline cost and accessibility;

EPND estimates the cost of constructing the 24- and 30-inch pipeline to be \$2.6 billion, including \$1.2 billion in Minnesota.

The pipeline will be an open access common-carrier pipeline. Through an open season process, Sandpiper will enter into contracts with shippers for a specified capacity to be transported (or paid for) over a 10- year term. The remaining capacity will be offered on a month-to-month basis and each month shippers will nominate the crude oil volumes they seek to transport. The tolls and tariff will be subject to FERC's approval.

The preferred route is located in a manner that facilitates access for normal pipeline maintenance, as well as emergency response.

F. use of existing rights-of-way and right-of-way sharing or paralleling;

Sandpiper will generally be co-located with existing pipeline right-of-way or other third-party rights-of-way in Minnesota. From the North Dakota border at approximate MP 299.1 the Project will generally follow EPND's existing Line 81 right-of-way for 77 miles across Polk, Red Lake, and Clearwater counties to approximate MP 376.0 at Clearbrook, Minnesota. At Clearbrook, Minnesota, the pipeline will turn south and will generally follow the existing Minnesota Pipe Line Company right-of-way for approximately 64 miles across Clearwater and Hubbard counties to a point near Hubbard, Minnesota. From Hubbard, Minnesota, the pipeline extends east paralleling existing electrical transmission, pipeline, and small utility rights-of-way, as well as minimal greenfield parcels for approximately 158 miles across Hubbard, Cass, Crow Wing, Aitkin, and Carlton counties to MP 597.8.

Approximately 212 miles (70 percent) of the construction right-of-way would be co-located with or parallel to and offset from other existing rights-of-way (see section 1.1 of the EIR). Other third-party rights-of-way include roads, pipelines and electric transmission lines.

G. natural resources and features;

A detailed description of natural resources and features crossed by Sandpiper is presented in Sections A, B, C, and D, above.

H. the extent to which human or environmental effects are subject to mitigation by regulatory control and by application of the permit conditions contained in part 7852.3400 for pipeline right-of-way preparation, construction, cleanup, and restoration practices;

EPND assumes this rule should refer to Minn. R. 7862.3600, which provides a list of 14 wide-ranging permit conditions that will be applied to the Project. EPND designed the Project and planned construction with these conditions in mind, and believes that the conditions, together with regulatory oversight from the Minnesota Public Utilities Commission (“MPUC”) and other state and federal regulatory agencies, will provide significant protection for the human and natural environments.

I. cumulative potential effects of related or anticipated future pipeline construction;

At this time, EPND has no firm plans for future pipeline construction that would result in cumulative potential effects on environmental resources. However, EPND has routed the Project to facilitate construction of future projects as co-located facilities along the Sandpiper right-of-way. In the event that another project is approved and would follow the Sandpiper right-of-way, environmental impacts of subsequent construction would be reduced by utilizing the work space created for Sandpiper, to the extent practicable.

Additionally, EPND has designed the Project to facilitate capacity expansions in the future should shippers request the ability to move additional volumes in excess of the capacities requested in this application. The Project has been designed for an ultimate design capacity of 406,000 bpd (365,000 bpd annual capacity) from the North Dakota/Minnesota border to Clearbrook, Minnesota. From Clearbrook, Minnesota to the Minnesota/Wisconsin border the pipeline has been designed for an ultimate capacity of 711,000 bpd (640,000 bpd annual capacity). The increases in capacity to the ultimate design capacity would be achieved through the addition of new pumping units along the pipeline right-of-way. The pipeline will be designed, constructed, and hydrostatically tested for operation at the ultimate design capacity.

J. the relevant applicable policies, rules, and regulations of other state and federal agencies, and local government land use laws including ordinances adopted under Minnesota Statutes, section 299J.05, relating to the location, design, construction, or operation of the proposed pipeline and associated facilities.

A list of known federal, state, and local approvals necessary for construction of the Project is presented in Section 7852.3000 of this application. EPND will work with all regulatory agencies with permitting authority over the Project, and will satisfy all permit requirements of those agencies. EPND expects that compliance with those permits will be a condition of any permit issued by the MPUC.

7852.2800 RIGHT-OF-WAY PROTECTION AND RESTORATION MEASURES

EPND developed standardized erosion control and restoration measures to minimize potentially adverse environmental effects resulting from right-of-way preparation, construction, and maintenance of the pipeline. These measures are described in EPND's EPP, which is provided in Appendix A of the EIR. The EPP contains industry and company-wide Best Management Practices for: mitigation measures; addresses construction spill prevention, containment, and control; drilling mud releases; noxious and invasive weeds; and restoration/revegetation measures.

EPND will also comply with applicable federal, state, and local rules and regulations and take appropriate precautions to protect against degradation of the environment. EPND will retain third-party Environmental Inspectors who will verify that environmental protection measures, environmental permit conditions, and other environmental specifications are implemented appropriately by the contractor during construction of the facilities. Environmental Inspectors will have peer status with all other construction inspectors and will have the authority to stop construction activities if they determine that it is necessary.

Subpart 1. Protection.

The applicant must describe what measures will be taken to protect the right-of-way or mitigate the adverse impacts of right-of-way preparation, pipeline construction, and operation and maintenance on the human and natural environment.

Measures that will be taken to protect the right-of-way or mitigate the adverse impacts of right-of-way preparation, pipeline construction, and operation and maintenance on the human and natural environment are described in detail in the EPP and APP in Appendices A and C, respectively, of the EIR.

Subpart 2. Restoration.

The applicant must describe what measures will be taken to restore the right-of-way and other areas adversely affected by construction of the pipeline.

Measures that will be taken to restore the right-of-way and other areas adversely affected by pipeline construction are described in detail in the EPP and the APP, in Appendices A and C, respectively, of the EIR.

7852.2900 OPERATION AND MAINTENANCE

Pipeline operations and maintenance are assumed to be in compliance with all applicable state and federal rules or regulations, unless determined otherwise by the state or federal agency having jurisdiction over the enforcement of such rules or regulations. For public information purposes, the applicant must provide a general description of the anticipated operation and maintenance practices planned for the proposed pipeline.

As a crude oil pipeline, EPND's design, construction, maintenance and operation functions are regulated by the U.S. Department of Transportation under Part 195 of Title 49 of the C.F.R., which governs Transportation of Hazardous Liquids by Pipeline. Oversight of EPND's operations is undertaken by the federal Pipeline and Hazardous Materials Safety Administration ("PMHSA") pursuant to the Hazardous Liquid Pipeline Safety Act, 49 U.S.C. 2001 et seq. EPND abides by all regulations issued by that agency. EPND also works directly with various regional, state, and local agencies, landowners, and other interested stakeholders to ensure its programs meet the needs of the community in which it operates.

The federal agency charged with enforcement of Part 195 is the U.S. Department of Transportation, PMHSA. In 1991, the Minnesota Office of Pipeline Safety ("MNOPS") was designated as an inspector on behalf of the PMHSA. Findings, reports, and recommendations from MNOPS inspectors are referred to the PMHSA for review and action.

In order to establish standards and guidelines for EPND's personnel, as well as to comply with Part 195 and other government regulations, EPND has developed comprehensive written procedures for the operation and maintenance of the pipeline. EPND's procedures and activities meet, and generally exceed, these government requirements. The following discussion provides a general overview of EPND's operation and maintenance practices.

Pipeline Control Center

The Project will be monitored by the EPND control center located in Estevan, Saskatchewan.

The Control Center is manned by pipeline operators 24-hours per day. A computerized pipeline control system allows these operators to remotely monitor and control the pipeline and related facilities. The Control Center also serves as an emergency response center to receive calls from employees, the public or public officials reporting unusual conditions or

pipeline failures.

The computerized pipeline control system has been designed to control the pipeline within pre-established minimum and maximum operating pressures. Both the computer system and operating practices include procedures for abnormal operating conditions, including emergency shutdown and isolation of the pipeline and notification procedures in the event of suspected emergencies.

In 2010, EPND developed a new Control Room Management plan based on the C.F.R. The plan was fully implemented by August 2012. EPND also revised and enhanced its procedures pertaining to decision making, handling pipeline startups and shutdowns, leak detection system alarms, communication protocols, and suspected column separations. EPND has enhanced its organizational structures to better support pipeline operators and workloads.

Pipeline Integrity and Reliability Program

EPND, understanding the risk of release associated with the volumes transported and the size of its lines, continues to be diligent in its program to ensure safety. Since 2010, Enbridge (inclusive of EPND) has:

- Heightened the importance of its pipeline and facility integrity program to assure broader company involvement and commitment to integrity management with new committees and planning processes focused on increasing planning and formalized issue resolution.
- Re-organized the functional areas responsible for pipeline and facility integrity, adding leadership and focused resources on traditional, new and emerging areas of pipeline integrity management, while also nearly doubling personnel dedicated to integrity management.
- Increased the number of in-line inspection programs and integrity digs (including excavation, examination, maintenance and repair by welded sleeve or pipe segment replacements) by more than 50% compared with pre-2010 levels. Additionally, the number of integrity digs more than doubled over that same time period. Pipeline integrity management spending was increased to over \$450 million in each of 2011 and 2012.
- Strengthened its focus on the tools, technologies and strategies needed to ensure that pipeline networks have the strength and operating fitness to perform safely, reliably and in an environmentally responsible manner.

- Revised and improved numerous procedures within its Integrity Management program. Specifically, process and procedure enhancements have been implemented to ensure that anomalies will be identified and repaired.

Enbridge (inclusive of EPND), and the industry as a whole, continues to improve accuracy of and develop new technology for pipeline integrity assessments. Enbridge (inclusive of EPND) has worked with the Association of Oil Pipelines and Pipeline Research Consortium International in launching further research to improve the ability of inspection tools to gather certain information from pipelines, and enhance techniques for pipeline operators to interpret information the tools collect.

EPND's operating and maintenance practices are aimed at preventing emergencies or releases from facilities at stations. However, it is imperative that EPND be prepared to respond to an emergency or release should one occur. In addition to the preventative activities described above, EPND's emergency response program has been prepared in compliance with PHMSA rules under 49 C.F.R. Part 194. The Emergency Response Plan has been approved by PHMSA and includes pre-planning, equipment staging, emergency notifications, and emergency and leak containment procedures.

Training

EPND has established and implemented a comprehensive orientation, technical, safety, emergency, and on-the-job training program that is in compliance with the Operator Qualification rules issued by the PHMSA under 49 C.F.R. Part 195. EPND personnel receive hundreds of hours of formal and on-the-job training as they progress in pipeline operation and maintenance positions. Demonstrations of competence are shown through a variety of measures that may include review of job performance, periodic use of pipeline control system simulators, emergency exercises, welding certification tests, and other functions required to continue safe pipeline and station facility operation and maintenance.

Public Outreach

EPND conducts a comprehensive public education program to ensure that the affected public (those who work and live along a pipeline), excavators, local public officials, and emergency units are aware of how to recognize and avoid or respond to a pipeline emergency. EPND has also been active at the local, county, and state level in emergency response planning and joint training and exercises to prepare all potential responders to deal with emergencies. The public awareness program includes liaison with

emergency responders in communities that host EPND station facilities. EPND also provides annual employee training for field employees to ensure they are prepared to work with the public and are effective in ensuring the public is aware of activities along the pipeline.

For the public's awareness of underground pipelines, the pipeline right-of-way is marked at all public road and railway crossings, at a minimum. Additional markings are posted at valves, other pipeline facilities, and stations along the pipeline route.

Right-of-Way Maintenance

Many other maintenance activities are performed on the pipelines and related facilities. EPND has a comprehensive preventative maintenance program that meets and, in many cases exceeds, federal safety standards set forth in 49 C.F.R. Part 195. Comprehensive standards for the design and installation of new or replacement facilities are provided in both EPND procedure manuals and contract specifications. Repair pipe is pre-tested and other components used to repair the pipelines meet national standards and all applicable regulatory requirements. Other activities, such as welding procedures, movement of the pipe, coating repair, corrosion control, and tank maintenance are all guided by written procedures which have been reviewed by the Federal and MNOPS inspectors.

7852.3000 LIST OF GOVERNMENT AGENCIES AND PERMITS

Each application must contain a list of all the known federal, state, and local agencies or authorities and titles of the permits they issue that are required for the proposed pipeline and associated facilities.

Table 7852.3000-1 lists the government agencies or authorities with which EPND must file for the Sandpiper Pipeline Project. This table lists the title of each permit or certificate issued, anticipated application and decision dates, and status of the permit or certificate.

In addition to this Route Permit application, EPND will also be filing an application for a Certificate of Need with the MPUC, which will require EPND to provide certain information to landowners, local governmental units and the State about plans for pipeline construction. EPND filed a Notice Plan with the MPUC on June 7, 2013, pursuant to Minnesota Rule 7829.2560. Implementation of the Notice Plan ensures that appropriate notice of the project is provided to interested parties through direct mail and publication. Public meetings will be held which will provide local governmental units and landowners with information about EPND's plans.

Table 7852.3000-1 Preliminary List of Government Authorities and Titles of Permits/Approvals (Minnesota Portion of Project Only)				
Name of Agency	Title of Permit/Approval	Date of Application ^a	Date of Decision ^b	Status
United States Army Corps of Engineers ("USACE") – St. Paul District and Minnesota Pollution Control Agency	Section 10/404 Individual Permit and associated state 401 Individual Water Quality Certification	December 2013	December 2014	Preliminary Application reviewed with USACE in October 2013.
United States Fish and Wildlife Service	Section 7 Endangered Species Act Consultation (Federal endangered species)	April 2013	December 2014	Initial consultation in April 2013. Further consultation pending identification of a lead federal agency.
Minnesota Public Utilities Commission	Pipeline Routing Permit	November 2013	November 2014	Application submitted
	Certificate of Need	November 2013	November 2014	Application submitted

Table 7852.3000-1 Preliminary List of Government Authorities and Titles of Permits/Approvals (Minnesota Portion of Project Only)				
Name of Agency	Title of Permit/Approval	Date of Application ^a	Date of Decision ^b	Status
Minnesota Department of Natural Resources	License to Cross Public Waters	September 2013	August 2014	Preliminary Application submitted
	License to Cross Public Lands	September 2013	August 2014	Preliminary Application submitted
	Water Appropriation General Permit (hydrostatic test water and trench dewatering)	2015	2015	Pending submittal
	State Endangered Species Consultation	April 2013	September 2014	Consultation initiated
Minnesota Pollution Control Agency	Clearbrook Station New Source Performance Standards Notifications and Submittals	February 2014	June 2014	Pending submittal
	NPDES Individual Construction Stormwater, Hydrostatic Test, and Trench Dewatering Permit – Pipeline Construction	March 2014	October 2014	Consultation initiated, pending submittal
	NPDES General Construction Stormwater Coverage – Pipeyards and Contractor Yards	December 2013	April 2014	Consultation initiated, pending submittal
Minnesota State Historic Preservation Office	Cultural Resources Consultation, NHPA Section 106 Clearance	April 2013	December 2014	Consultation initiated. Further consultation pending identification of a lead federal agency.
Minnesota Department of Agriculture	Agricultural Protection Plan	April 2013	November 2014	Consultation initiated
Minnesota Department of Transportation	Road Crossing Permits	October 2014	April 2015	Pending submittal

Table 7852.3000-1 Preliminary List of Government Authorities and Titles of Permits/Approvals (Minnesota Portion of Project Only)				
Name of Agency	Title of Permit/Approval	Date of Application ^a	Date of Decision ^b	Status
Mississippi Headwaters Board	Local Land Use Review	July 2013	September 2014	Consultation initiated
Red Lake and Wild Rice Watershed Districts	Watershed District Permit	February 2014	April 2014	Consultation initiated, pending submittal
Local Government Units	Wetland Conservation Act Utility Exemption	December 2013	December 2014	Consultation initiated; concurrent with USACE application
Local/County	Permits pertaining to off-right-of-way yard use	October 2014	April 2015	Pending submittal
^a Actual date of initial consultation/anticipated dates for submission. ^b Projected dates of action.				

7852.3100 EVIDENCE OF CONSIDERATION OF ALTERNATIVE ROUTES

If the applicant is applying for a pipeline routing permit under parts 7852.0800 to 7852.1900, the applicant shall provide a summary discussion of the environmental impact of pipeline construction along the alternative routes consistent with the requirements of parts 7852.2600 to 7852.2700 and the rationale for rejection of the routing alternatives.

EPND studied a variety of alternatives for routing. The study consisted of the no-action alternative, system alternatives, and route alternatives. An alternative had to meet three factors to be considered viable: ability to meet the project objectives; technical and economic feasibility; and have significant environmental advantages over the preferred route.

The following sections describe EPND's process for selecting the preferred route and provide an analysis of alternatives. A detailed discussion of route alternatives is provided in Section 2.0 of the EIR.

Initial Route Selection Process

EPND determined that the Project should initiate at its Beaver Lodge station near Tioga, North Dakota, as this site provides an ideal location to efficiently gather and transport crude oil produced in the Bakken and Three Forks formations. EPND determined that the Project should connect with existing facilities at Clearbrook, Minnesota so that up to 150,000 bpd from the existing Line 81 could be transported on the Sandpiper Pipeline. Finally, EPND determined that the Project should terminate at its Superior, Wisconsin terminal, where crude oil shipped from the Bakken could be further transported to refineries and markets in the Midwest and East Coast.

EPND owns and operates Line 81, an existing interstate pipeline transportation system that gathers crude oil from points near production wells in western North Dakota and transports the volumes to Clearbrook, Minnesota for delivery to Minnesota Pipe Line Company, which serves two Minnesota refineries, and the Enbridge Mainline System. From Clearbrook, Enbridge operates seven pipelines within the Enbridge Mainline System that provide connections with the Superior terminal and refineries throughout the Midwest and the East Coast. Once Sandpiper is constructed, the EPND connection with the Enbridge Mainline System will be removed and Sandpiper will carry the existing EPND Line 81 volumes to Superior, Wisconsin where they will enter the Enbridge Mainline System. EPND sought to co-locate Sandpiper as much as possible with existing infrastructure.

EPND assessed the route from Tioga, North Dakota to Superior, Wisconsin with the intent of following existing third-party rights-of-way to the extent practicable while identifying specific areas where co-location may not be practicable. The first step in the route selection process consisted of collecting publicly available environmental data to identify routing constraints. The sources of data consisted primarily of GIS digital information layers including: USGS topographic maps; USGS land use database; U.S. Department of Agriculture Farm Services Agency aerial photography and GIS data; NWI maps; MNDNR National Heritage Information System data; Minnesota Department of Transportation ("MNDOT") highway maps; U.S. Department of Agriculture state soil geographic (State Soil Geographic ["STATSGO2"] and Soil Survey Geographic ["SSURGO"]) databases; and other natural feature databases obtained from the MNDNR website and other state and federal sources. Existing major third-party rights-of-way also were identified for potential use in co-location.

The next step involved reviewing selected layers of the collected GIS data on digital USGS topographic maps and recent aerial photography to identify the locations of environmental constraints within the study area.

EPND initially analyzed two routes, known as the Northern Route and the Southern Route, in Minnesota between Clearbrook and the Minnesota/Wisconsin Border. Both of these routes were included in EPND's June 7, 2013 MPUC Notice Plan filing. EPND chose to pursue the Southern Route between Clearbrook and the Minnesota/Wisconsin Border as its preferred route. The Northern Route is analyzed as a route alternative. Refer to Section 2.3.3 of the EIR for a detailed discussion of alternative routes that were examined.

EPND conducted a number of route reconnaissance efforts to further examine specific areas of concern identified during the desktop review. During field reviews, the route was examined and adjustments were made to avoid or minimize potential impacts on sensitive environmental or cultural features, to adjust for preferred construction alignment, or to accommodate landowner concerns. Further refinement of the route was conducted as detailed engineering design efforts led to the identification of specific facility modifications or additions. EPND's existing pipeline right-of-way west of Clearbrook, Minnesota generally provides the opportunity for co-location; however, in some locations east of Clearbrook it is not feasible to use existing Enbridge rights-of-way due to inability to acquire land (even through the exercise of eminent domain authority), congestion, poor crossing conditions, or other constraints. Co-location with third-party rights-of-way east of Clearbrook provides environmental advantage in that land disturbance will be generally located alongside areas that have been previously disturbed.

EPND continues to refine the route to address engineering, environmental, and landowner concerns.

Comparison of Route Alternatives

EPND conducted a detailed quantitative analysis of environmental impacts along each route alternative. This analysis used the same sources of publicly available environmental data described above in the Initial Route Selection Process. EPND identified and compared a variety of factors for each route, including: proximity to existing rights-of-way, wetlands, highly wind erodible soils, bedrock outcrops, prime farmland, perennial waterbodies, national forest land, tribal land, state forest land, WMAs, AMAs, railroads crossed, roads crossed, and other site-specific issues that may occur.

During its route selection process, EPND identified and analyzed four route alternatives in addition to the preferred route in Minnesota for the Project. They were the Northern Route, the Aitkin County Powerline Route, the Allele Powerline Route, and the Aitkin County Soo Line Route. None of these route alternatives were adopted as the Project's preferred route.

Refer to Section 2.3.3 of the EIR for a detailed discussion of the route alternatives considered for the Project.