



WBI ENERGY TRANSMISSION, INC.

Wahpeton Expansion Project

**Resource Report 11
Reliability and Safety**

Final

**Docket No.
CP22-XXX-000**

May 2022

**WBI ENERGY TRANSMISSION, INC.
WAHPETON EXPANSION PROJECT
RESOURCE REPORT 11—RELIABILITY AND SAFETY**

Minimum Filing Requirements for Environmental Reports:		Addressed In:
This report is required for applications involving new or recommissioned liquefied natural gas facilities.		
1. Describe measures proposed to protect the public from failure of the proposed facilities (including coordination with local agencies)—18 Code of Federal Regulations (CFR) § 380.12 (m)(1).		Not applicable
2. Discuss hazards, the environmental impact, and service interruptions which could reasonably ensue from failure of the proposed facilities—18 CFR § 380.12 (m)(2).		Not applicable
3. Discuss design and operational measures to avoid or reduce risk—18 CFR § 380.12 (m)(3).		Not applicable
4. Discuss contingency plans for maintaining service or reducing downtime—18 CFR § 380.12 (m)(4).		Not applicable
5. Describe measures used to exclude the public from hazardous areas. Discuss measures used to minimize problems arising from malfunctions and accidents (with estimates of probability of occurrence) and identify standard procedures for protecting services and public safety during maintenance and breakdowns—18 CFR § 380.12 (m)(5).		Not applicable
Additional Information		
1. Describe how the project facilities would be designed, constructed, operated, and maintained to minimize potential hazard to the public from the failure of project components as a result of accidents or natural catastrophes.		Sections 11.2 and 11.3
Federal Energy Regulatory Commission's April 14, 2022 Comments on Draft Resource Report 11:		
1. Clarify why WBI Energy labels most of the minimum filing requirements for resource report 11 as "Not applicable."		Per FERC's minimum filing requirements and regulations, Resource Report 11 is required for "applications involving new or recommissioned LNG facilities." As the proposed Project does not involve LNG facilities, it is not required and the minimum filing requirements identified are not applicable to the Project facilities. However, WBI Energy understands the importance of addressing reliability and safety even for pipeline infrastructure and includes a Resource Report 11 that addresses the reliability and safety topics associated with the Project.
2. Include measures that would be taken if the Class designation of the pipeline changed over time.		See updated section 11.1.1.
3. Provide an update to WBI Energy's efforts to identify proposed or reasonably foreseeable high consequence areas and any other "identified sites" associated with the planned Project.		No high consequence areas would be crossed by the proposed pipeline or aboveground infrastructure. No updates to section 11.1.1 are necessary.
4. Provide an update to WBI Energy's efforts to identify proposed or reasonably foreseeable moderate consequence areas associated with the planned Project.		WBI Energy identified two moderate consequence areas and discusses these in section 11.1.1.
5. Specify the potential impact radius.		See updated section 11.1.1.
6. Indicate whether during coordination with local emergency responders any needs for additional equipment were identified.		No emergency responders have identified any needs for additional equipment. See updated section 11.2.7.

**WBI ENERGY TRANSMISSION, INC.
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RESOURCE REPORT 11—RELIABILITY AND SAFETY**

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ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
ERP	emergency response plan
HCA	high consequence area
IMP	integrity management program
MCA	moderate consequence area
MDU	Montana-Dakota Utilities Company
PHMSA	Pipeline and Hazardous Materials Safety Administration
Project	Wahpeton Expansion Project
SCADA	Supervisory, Control, and Data Acquisition System
U.S. DOT	United States Department of Transportation
WBI Energy	WBI Energy Transmission, Inc.

**WBI ENERGY TRANSMISSION, INC.
WAHPETON EXPANSION PROJECT**

11.0 RESOURCE REPORT 11—RELIABILITY AND SAFETY

WBI Energy Transmission, Inc. (WBI Energy) proposes to construct, modify, operate, and maintain the Wahpeton Expansion Project (Project). The Project will involve the construction of approximately 60.5 miles of 12-inch-diameter natural gas transmission pipeline from WBI Energy's existing Mapleton Compressor Station near Mapleton, North Dakota to a new Montana-Dakota Utilities Company (MDU)—Wahpeton Border Station near Wahpeton, North Dakota. The Project will also include minor modifications at the Mapleton Compressor Station; a new MDU—Kindred Border Station near Kindred, North Dakota; new block valve settings; and new pig launcher/receiver settings. The Project may also include newly constructed farm taps along the pipeline route. The proposed Project facilities will be located in Cass and Richland Counties, North Dakota. Figure 1.1-1 of Resource Report 1 provides an overview of the proposed pipeline and associated facilities.

In accordance with Title 18 of the Code of Federal Regulations (CFR) Part 380.12(m), Resource Report 11 provides a discussion of the reliability and safety aspects of WBI Energy's proposed Project. WBI Energy will maintain and operate its facilities pursuant to federal safety standards and company policies and procedures.

11.1 NATURAL GAS TRANSMISSION PIPELINE SAFETY STANDARDS

Most natural gas used in the United States is delivered to consumers through approximately 301,647 miles of transmission pipelines, providing about 25 percent of the total energy consumption in the United States (U.S. DOT, PHMSA, 2020a; 2020b). Because of the critical role that transmission pipelines play in supplying a large portion of the country's energy needs, it is imperative that they are safe and reliable. Pipelines and related facilities are designed and maintained with strict adherence to the Pipeline and Hazardous Materials Safety Administration's (PHMSA) regulations, which are intended to provide public safety and reliability and to minimize the risk of system failure.

The natural gas transmission industry has an excellent record of public safety and reliability. Nevertheless, the transportation of natural gas by pipeline involves some risk to the public in the event of an accidental release of natural gas. The Project will transport natural gas that primarily contains methane, but also contains smaller amounts of ethane, propane, and higher hydrocarbon gases such as butane. This product is a colorless and practically odorless gas. If natural gas is breathed in high concentrations, oxygen deficiency can occur—resulting in serious injury or suffocation. Natural gas has an auto-ignition temperature of approximately 1,000 degrees Fahrenheit and is flammable at methane concentrations between 5 and 15 percent in air. These concentrations can be reached when natural gas is in a confined space and could result in a hazard in the presence of an ignition source. Unconfined mixtures of natural gas and air become highly diluted and are not usually explosive. Lighter components of natural gas, such as methane, are buoyant at atmospheric temperatures and, if released, rise and disperse rapidly in air. Higher hydrocarbon components of natural gas, such as propane, are heavier than air and, although unlikely, may form a potentially flammable cloud near the ground until sufficiently dispersed in air.

The PHMSA administers the national regulatory program to provide for the safe transportation of natural gas and other hazardous materials by pipeline. Safety regulations and other approaches to risk management provide for safety in the design, construction, testing, operation, and maintenance of pipeline facilities. These standards are specified in 49 CFR Part 192.

11.1.1 Pipeline Design, Construction, and Operating Standards

WBI Energy is committed to protecting the safety of those living or working near its pipeline system and to working proactively to keep its system operating safely and effectively. Accordingly, the Project facilities will be designed, constructed, modified, tested, operated, inspected, and maintained to meet or exceed the United States Department of Transportation's (U.S. DOT) Minimum Federal Safety Standards specified in 49 CFR Part 192. These regulations are intended to ensure adequate protection of the public from natural gas pipeline facility accidents and failures; in addition, 49 CFR Part 192 specifies the minimum material, design, welding, construction, testing, protection from corrosion, operations, maintenance, and personnel qualifications for pipelines. Further, Subpart O requires each pipeline operator to have a detailed integrity management program (IMP). As a part of the IMP, the following activities are periodically performed on the line to assess the pipe for any features requiring remediation (e.g., corrosion, dents, and gouges): high-resolution, in-line inspection tools (i.e., smart pigs); pressure tests; or direct assessments.

The U.S. DOT's regulations in 49 CFR Part 192 define area classifications (called class location units) based on population density in the vicinity of a pipeline and specify more rigorous safety requirements for populated areas. Part 192 specifies pipe wall thickness, hydrostatic test pressures, inspection, testing of welds, spacing of mainline valves, depth of cover, and frequency of pipeline/facility patrols and leak surveys based on class location. Each class location unit covers the area extending 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The proposed Project will fall under a Class 1 designation for its entire length, which is specified as any class location unit that has 10 or fewer buildings intended for human occupancy.

WBI Energy will monitor population changes in the vicinity of the pipeline over the life of the pipeline system. If an increase in population density adjacent to the right-of-way is detected, WBI Energy will evaluate whether a change in class location is required and, if required, will reduce the maximum allowable operating pressure or replace the segment with pipe of sufficient grade and wall thickness, if necessary, to meet the requirements of 49 CFR Part 192.

The U.S. DOT's regulations (49 CFR Part 192, Subpart O) also specify how pipeline operators must identify, prioritize, assess, evaluate, repair, and validate the integrity of natural gas transmission pipelines that could affect high consequence areas (HCA) in the event of a leak or failure. The regulations require pipeline operators to develop and follow a written IMP that contains all the elements described in 49 CFR Part 192.911 and that addresses the risks on each covered segment of the transmission pipeline. Class 3 and Class 4 locations are, by definition, HCAs. In addition, HCAs include any area within a Class 1 or Class 2 location where the potential impact radius from a pipeline incident is greater than 660 feet (200 meters) and the area within the potential impact circle contains 20 or more buildings intended for human occupancy, or any

area within a potential impact circle that contains an identified site.¹ The potential impact radius for the proposed pipeline is 348 feet.

No HCAs have been identified along the proposed Project route. However, the Project will be incorporated into WBI Energy's existing IMP and will use the following criteria to determine HCA locations within the potential impact circle if conditions change along the pipeline system:

- identification of a site with 20 or more buildings intended for human occupancy; or
- location of an identified site.

On October 1, 2019, PHMSA issued a final rule amending the Federal Pipeline Safety Regulations in 49 CFR Parts 191 and 192 to address integrity management requirements and to improve the safety of onshore gas transmission lines (84 Federal Register 52180). The amendments, which became effective July 1, 2020, focus on reconfirmation of the maximum allowable operating pressure for existing pipelines and the expansion of assessment requirements for pipelines in areas not designated as HCAs. The criteria for a moderate consequence area (MCA), as defined in the new amendments, is an area that is within the potential impact circle of the pipeline that contains five or more buildings intended for human occupancy, or any portion of the paved surface including shoulders of a designated interstate, freeway, expressway, or any other principal arterial roadway with four or more lanes that lies within the potential impact circle. WBI Energy has identified two areas that would qualify as an MCA. One is where the pipeline crosses Interstate 94 and would be approximately 900 feet in length. The second is where the pipeline crosses Interstate 29 and parallels the on-ramp and would be approximately 6,500 feet in length.

11.1.2 Aboveground Facility Design

In addition to the pipeline safety standards described above, 49 CFR Part 192 also specifies safety standards for the design and operation of other aboveground facilities, such as block valves and meter stations. The aboveground facilities constructed as part of the Project will be designed, constructed, and operated to meet or exceed these standards.

11.2 OPERATING AND EMERGENCY RESPONSE MEASURES TO PROTECT THE PUBLIC

WBI Energy maintains operating policies and procedures that are periodically reviewed by the U.S. DOT. The policies provide specific directions in regular preventive maintenance and vigilant patrols of facilities and provide procedures to follow in the event of an accident or natural catastrophe. All operating personnel are trained to perform operations and maintenance activities in accordance with these policies and procedures. Further, periodic training sessions are conducted for operations employees to review typical operating and emergency response procedures or to update employees on changes in procedures. This training includes safe operation of pipeline and aboveground facilities, hazardous material handling procedures,

¹ An identified site is defined as an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least five days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

firefighting, public liaison, and general operating procedures. The proposed Project will be operated and maintained in accordance with each of these policies and procedures.

11.2.1 Line Patrols

WBI Energy will inspect the pipeline periodically on foot, by all-terrain vehicle, or by other vehicle as required by applicable regulatory requirements to identify potential concerns that may affect the safety and operation of the pipeline. Pipeline markers and signs will be inspected, maintained, and replaced as necessary to ensure that pipeline locations are clearly identified. Field personnel will advise the appropriate operations personnel of new construction along or near the pipeline. Issues identified are investigated and appropriately remediated based on risk assessment.

11.2.2 Integrity Management

The proposed Project will be hydrostatically strength and leak tested throughout its entire length before it is put into service. In this procedure, water or test media is introduced into the pipeline and pressurized to a specified magnitude above the maximum allowable operating pressure for a specified amount of time. This test is used to confirm that the facility will operate safely at the designed pressure.

WBI Energy will also conduct a baseline assessment using in-line inspection of the proposed pipeline to check for damage, deformities, or other factors that could affect the integrity of the pipeline. If potential problems are identified, repairs will be made to the affected segment of pipe.

11.2.3 System Control

The proposed Project will be incorporated into WBI Energy's extensive Supervisory, Control, and Data Acquisition System (SCADA). The Gas Control Center is located at WBI Energy's headquarters in Bismarck, North Dakota and is staffed 24 hours a day, 365 days a year. Gas controllers use SCADA to monitor the pipeline system, which includes a wide range of activities such as monitoring the gas pressures and flows along the pipeline and monitoring the operating system valves along the pipeline.

Data acquisition occurs at many locations along the mainline, such as compressor stations and meter stations. This data is transmitted to Gas Control through SCADA. If system parameters fall outside a predetermined range, an alarm is activated at Gas Control and corrective action is taken by the gas controller as needed. Local WBI Energy personnel are dispatched in response to these alarms if intervention is required outside of Gas Control.

In accordance with future and pending PHMSA requirements for new pipelines, WBI Energy plans to install automated valves such as automatic shut-off valves or remote control valves. Final automated valve installation will be dependent on finalization of PHMSA requirements for valve settings on new pipelines.

11.2.4 Corrosion and Cathodic Protection

The minimum requirements for the protection of metallic pipelines from external, internal, and atmospheric corrosion are prescribed in 39 CFR Part 192 Subpart I. Line pipe used to

construct the Project will be externally coated at the pipe mill with fusion bond epoxy. A compatible coating will be applied in the field over circumferential welds and assembly piping will be coated with epoxy-based or tape style coatings.

In accordance with PHMSA requirements, WBI Energy will install cathodic protection systems at various points along the proposed pipeline to inhibit external corrosion of the underground facilities. This cathodic protection system will impart a low-voltage current to the pipeline to offset natural soil corrosion potential should the coating become damaged over the life of the pipeline. Specifics regarding the locations and design of these systems are still being determined, but facilities will include a new Cathodic Protection Unit and ground bed at the MDU—Kindred Border Station. WBI Energy will also connect the system to an existing rectifier at the Mapleton Compressor Station. Test lead locations will be installed along the proposed pipeline and will be located directly over the top of the pipe. WBI Energy will inspect the cathodic protection system at regular intervals to ensure proper operating conditions are consistent with the PHMSA requirements for corrosion mitigation.

11.2.5 Pipeline Markers

WBI Energy will install markers at road and railroad crossings and other locations (e.g., fence lines and stream crossings) to indicate the pipeline location and to convey emergency information in accordance with the U.S. DOT's safety requirements.

11.2.6 Aboveground Facilities

WBI Energy personnel will operate and maintain the proposed aboveground facilities in accordance with all of the U.S. DOT's requirements. Operational testing will be performed on safety equipment to ensure that it performs as intended and corrective actions will be taken as necessary. The Mapleton Compressor Station is equipped with flame detection, gas detection, and an emergency shutdown system that will isolate the station from the pipeline and vent the gas from the station piping if a potentially unsafe condition is detected. Station piping will be equipped with overpressure protection devices or relief valves so that the maximum pressure is not exceeded.

11.2.7 Emergency Preparedness and Procedures

The U.S. DOT's regulations prescribe the minimum standards for operating and maintaining pipeline facilities, including a requirement to establish a written plan governing these activities. Additionally, pipeline operators are required to establish an emergency plan that identifies procedures to minimize hazards in a natural gas pipeline emergency to protect the public and the environment. Key elements of the plan include procedures for the following tasks:

- receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials and coordinating emergency response;
- emergency system shutdown and safe restoration of service;

- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first and protecting property subsequently and making both safe from actual or potential hazards.

WBI Energy currently has an emergency response plan (ERP) for its existing pipeline system in accordance with the U.S. DOT's regulations. WBI Energy will update its ERP as necessary to incorporate the proposed Project. The ERP will be made available prior to, and during, construction and will contain the appropriate emergency contacts (e.g., names and telephone numbers). To date, no emergency responders have identified any needs for additional equipment.

11.2.8 Liaison with Local Authorities

The U.S. DOT requires that pipeline operators establish and maintain liaison with local fire, police, and other emergency responders to plan for, and coordinate, emergency response efforts in the event of an incident during construction or operation of the proposed facilities. Each operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and to report it to the appropriate public officials. A portion of the proposed Project is located in Cass County where WBI Energy currently operates existing pipeline facilities. The remainder of the Project is in Richland County where WBI Energy currently has no facilities. WBI Energy will work with the local public officials and emergency responders in these counties and will provide appropriate training to responders.

11.2.9 Public Awareness

WBI Energy's public awareness program for its existing pipeline system provides information to excavators and the affected public, emergency officials, and public officials. The messaging includes, but is not limited to, the following:

- pipeline purpose and reliability;
- awareness of hazards and prevention measures undertaken;
- emergency preparedness communications;
- damage prevention awareness;
- one-call requirements;
- leak recognition and response;
- pipeline location and operator information;
- National Pipeline Mapping System information; and
- how to get additional information.

WBI Energy will incorporate the Project into its public awareness program.

11.2.10 Damage Prevention

WBI Energy is a member of “One Call” and related pre-excavation notification organizations in the states where it operates, including North Dakota. Through One Call, contractors or private individuals provide notification of proposed excavations to a central agency that, in turn, will notify WBI Energy of the excavation locations. If WBI Energy facilities are located in the area of proposed excavation, company representatives will mark the pipeline location, consult with the excavator as needed, and observe the excavation as necessary to prevent damage to the pipeline. WBI Energy supports enforceable one-call legislation in all of the states crossed by its pipeline facilities.

11.3 NATURAL GAS PIPELINE SAFETY OVERVIEW

11.3.1 Pipeline Safety Incident Data

The U.S. DOT requires operators of natural gas transmission pipelines to notify the National Response Center at the earliest practicable moment following discovery of a reportable incident. The National Response Center in turn notifies all appropriate response agencies including, but not limited to, the U.S. DOT / PHMSA.

A reportable incident as defined by the U.S. DOT / PHMSA (Electronic Code of Federal Regulations, 2021) is:

1. *An event that involves a release of gas from a pipeline, gas from an underground natural gas storage facility, liquefied natural gas (LNG), liquefied petroleum gas, refrigerant gas, or gas from an LNG facility and that results in one or more of the following consequences:*
 - i. *A death, or personal injury necessitating in-patient hospitalization;*
 - ii. *Estimated property damage of \$122,000 or more, including loss to the operator and others, or both, but excluding the cost of gas lost. For adjustments for inflation observed in calendar year 2021 onwards, changes to the reporting threshold will be posted on PHMSA's website. These changes will be determined in accordance with the procedures in appendix A to part 191; or*
 - iii. *Unintentional estimated gas loss of 3 million cubic feet or more.*
2. *An event that results in an emergency shutdown of an LNG facility or an underground natural gas storage facility. Activation of an emergency shutdown system for reasons other than an actual emergency within the facility does not constitute an incident.*
3. *An event that is significant in the judgment of the operator, even though it did not meet the criteria of paragraph 1 or 2 of this definition.*

Each operator must submit a written report to the PHMSA (U.S. DOT Form PHMSA F 7100.2) as soon as practicable but not more than 30 days after detection of a reportable incident. WBI Energy is subject to the PHMSA’s incident reporting requirements.

The PHMSA has a comprehensive website to make accident data available to the public, including data on significant incidents. These are defined as any leaks that cause a death or personal injury requiring hospitalizations or that involve property damage of more than \$50,000 in 1984 dollars (about \$134,000 in 2021 dollars). Table 11.3-1 summarizes significant incidents reported by operators of natural gas transmission pipelines to the PHMSA during the 20-year period from 2001 to 2020. As shown in the table, the largest numbers of incidents are caused by material/weld/equipment failure (32.7 percent) and corrosion (22.7 percent) and the largest numbers of fatalities have been caused by excavation damage and material/weld/equipment failures. The pipelines included in the dataset used to compile these statistics vary in age, outside diameter, and the level of corrosion control—each of which influences the frequency of significant incidents.

TABLE 11.3-1 Wahpeton Expansion Project Significant Incident Summary by Cause from 2001 through 2020 ^a				
Cause of Incident	Number of Incidents	Percent of Total	Fatalities	Injuries
Corrosion	323	22.7	1	5
Excavation Damage ^b	185	13.0	13	33
Incorrect Operation	67	4.7	6	11
Material/Weld/Equipment Failure	465	32.7	11	68
Natural Force Damage ^c	161	11.3	0	2
Other Outside Force Damage ^d	104	7.3	2	19
All Other Causes ^e	118	8.3	3	20
TOTALS	1,423	100	36	158
^a U.S. DOT, PHMSA, 2021; Significant Pipeline Incidents By Cause. ^b Includes third-party damage. ^c Includes earth movement, heavy rain/floods, and lightning. ^d Includes vehicle damage, fire, explosion, previous damage, and intentional damage. ^e Miscellaneous or unknown causes.				

Incident data and trends are assessed by the PHMSA and influence pipeline regulatory program priorities. In the last decade, for example, rules imposing standards of expectation for state One Call systems, state efforts to strengthen damage prevention programs, the PHMSA pipeline integrity management rules, operator qualification standards, pipeline control system and SCADA standards, and accident reporting guidelines have helped drive federal regulators, state partners, and the pipeline industry to improve technology and practices to reduce the number and consequences of accidents. WBI Energy is an active participant in such efforts.

11.3.2 Impact on Public Safety

The significant incident data summarized in table 11.3-1 includes pipeline failures of all magnitudes with widely varying consequences. These incidents collectively resulted in a total of

36 fatalities that occurred on natural gas transmission lines over the 20-year period between 2001 and 2020 for an average of 1.8 fatalities per year.

To provide a measure of the relative safety of natural gas pipelines, table 11.3-2 below identifies annual fatality rates for accidents and other hazards. Direct comparisons between the categories are not practical because individual exposures to hazards and/or accidents are not uniform; the data nonetheless indicate a low risk of death due to incidents involving natural gas transmission pipelines compared to the other categories.

TABLE 11.3-2 Wahpeton Expansion Project Accidental Deaths per year by Cause	
Type of Accident	Number of Fatalities
All injuries (unintentional) ^a	173,040
Motor vehicle accident ^a	37,595
Poisoning/exposure to noxious chemicals (unintentional) ^a	65,773
Falls (unintentional) ^a	39,443
Suffocation (unintentional) ^a	7,076
Drowning (unintentional) ^a	3,692
Fire/flare (unintentional) ^a	2,692
Floods ^b	85
Tornado ^b	69
Lightning ^b	39
Natural gas transmission pipelines ^c	2
^a HHS, CDC, 2021. ^b NOAA, National Weather Service, 2021; 30 Year Average (1991 to 2020). ^c U.S. DOT, PHMSA, 2021; Serious Pipeline Incidents By Cause 20 Year Average (2001 to 2020). This number has been rounded up.	

11.4 REFERENCES

- Electronic Code of Federal Regulations. 2021. *Part 191—Transportation of Natural and Other Gas by Pipeline, Annual Reports, Incident Reports, and Safety-Related Condition Reports*. Available online: <https://www.ecfr.gov/current/title-49/subtitle-B/chapter-I/subchapter-D/part-191>. Accessed: December 2021.
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