

**ARTICLE 24.00  
TRANSMISSION PIPELINE RISK REDUCTION OVERLAY DISTRICT**

**Section 24.01: Land Use in Transmission Pipeline Overlay District**

**Purpose**

The Brookings County Planning Commission and Board of County Commissioners recognize: (1) that oil and gas transmission pipelines are federally regulated, including 49 Code of Federal Regulations (CFR) 190 through 195, and that oil and gas transmission pipelines and pipelines which transport gas from methane digesters are state regulated, through South Dakota Codified Laws (SDCL) Chapter 49-34B and SDCL Chapter 49-41B and (2) that Brookings County can implement safety measures to protect citizens and sensitive environmental areas within the borders of Brookings County through SDCL Chapter 7-8-20.

The Brookings County Planning Commission and Board of County Commissioners recognize: (1) that third-party damage and pipeline right-of-way encroachment are significant threats to pipeline safety; (2) that transmission pipelines may pose a risk to public safety and/or the environment if ruptured or damaged; and (3) that certain land use practices can reduce the likelihood of accidental damage to gas and hazardous liquid pipelines and reduce adverse impacts of pipeline failures located within Brookings County.

The purpose of the Transmission Pipeline Risk Reduction Overlay District is to protect public health and safety by reducing the likelihood of pipeline damage and reducing the adverse impact of pipeline failures through risk-based land management decisions. It is the intent to accomplish this, as much as possible, by public education, early consultation among stakeholders and securing public cooperation.

The Transmission Pipeline Risk Reduction Overlay District will be incorporated into Brookings County Geographic Information Systems mapping and used primarily when issuing Zoning and Building permits to facilitate discussions among developers, landowners, and pipeline operators.

The Transmission Pipeline Risk Reduction Overlay District will enhance and not preclude the requirements of the South Dakota One Call System.

The Transmission Pipeline Risk Reduction Overlay District and the provisions of this article will be applied to federally and state regulated hazardous liquid and

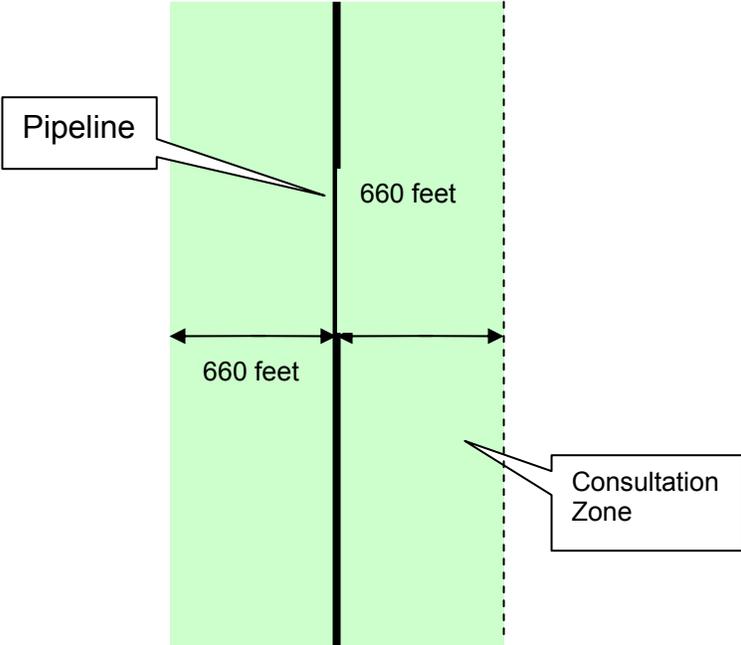
gas transmission pipelines, and pipelines which transport gas from methane digesters but will exclude gas gathering or distribution pipelines.

Brookings County reserves the right to implement the Transmission Pipeline Risk Reduction Overlay District on new direct service pipelines constructed for non-agricultural and non-residential facilities such as gas power plants and commercial methane digesters .

Appropriate land use regulations will be imposed, however, which are in addition to those imposed in the underlying zoning districts or in other county regulations.

**Definitions**

- 1. Consultation Zone: An area extending 660' from each side of a transmission pipeline, which defines when a property developer/owner, who is planning new development in the vicinity of an existing transmission pipeline, should initiate a dialogue with a transmission pipeline operator.



- 2. Development: The carrying out of any construction, reconstruction, alteration of surface or structure or change of land use or intensity of use.
- 3. Development Permit: for the purposes of the Consultation Zone requirements, means any permit for development activity that involves construction, grade modification, excavation, blasting, land clearing, or the deposit of earth, rocks or other materials that places an additional load upon the

soil. Construction that involves work totally within an existing building footprint and does not involve excavation, such as residential remodeling projects, is specifically exempted from these Consultation Zone requirements.

4. Distribution Pipeline: A gas pipeline other than a gathering or transmission line (reference 49 CFR 192.3). A distribution line is generally used to supply natural gas to the consumer and is found in a network of piping located downstream of a natural gas transmission pipeline.

5. Easement: (1) A legal instrument giving a transmission pipeline operator a temporary or permanent right to use a right-of-way for the construction, operation, and maintenance of a pipeline. It may also include temporary permits, licenses, and other agreements allowing the use of one's property. (2) An easement is an acquired privilege or right, such as a right-of-way, afforded a person or company to make limited use of another person or company's real property. For example, the municipal water company may have an easement across your property for the purpose of installing and maintaining a water line. Similarly, oil and natural gas pipeline companies acquire easements from property owners to establish rights-of-way for construction, maintenance and operation of their pipelines. (3) A legal right, acquired from a property owner, to use a strip of land for installation, operation and maintenance of a transmission pipeline.

6. Encroachment: (1) A human activity, structure, facility, or other physical improvement that intrudes onto a transmission pipeline right-of-way. (2) Encroachment refers to the unauthorized use of a right-of-way in violation of the easement terms.

7. Excavation: Any operation in which earth, rock or other material [in or on the ground] [within 12" of grade level] is moved, removed or otherwise displaced by means of any tools, equipment or explosives and includes, without limitation, backfilling, grading, trenching, digging, ditching, drilling, pulverizing, rubblizing, well-drilling, augering, boring, tunneling, scraping, cable or pipe plowing, plowing-in, pulling-in, ripping, driving, and demolition of structures, except that, the use of mechanized tools and equipment to break and remove pavement and masonry down only to the depth of such pavement or masonry, the use of high-velocity air to disintegrate and suction to remove earth, rock and other materials, and the tilling of soil for agricultural or seeding purposes shall not be deemed excavation. Backfilling or moving earth on the ground in connection with other excavation operations at the same site shall not be deemed separate instances of excavation.

8. Gas Transmission Pipeline: means a "transmission line" as defined by Title 49, Code of Federal Regulations, Section 192.3. A pipeline, other than a

gathering line, that: (1) transports gas from a gathering line or storage facility to a distribution center, storage facility, or large-volume customer that is not downstream from a distribution center; (2) operates at a hoop stress of 20 percent or more of specified minimum yield strength; or, (3) transports gas within a storage field. (Reference 49 CFR 192.3) A gas transmission pipeline includes all parts of those physical facilities through which gas moves in transportation, including pipe, valves, and other appurtenance attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies.

9. Hazardous Liquid: Petroleum, petroleum products, or anhydrous ammonia and carbon dioxide (49 CFR 195.2); or liquid natural gas (LNG) or a liquid that is flammable or toxic (49 CFR 193.2007).

10. Hazardous Liquid Pipeline: means a pipeline designed for the transmission of a "hazardous liquid", as defined by Title 49, Code of Federal Regulations, Section 195.2. All parts of a pipeline facility through which a hazardous liquids move in transportation, including, but not limited to, line pipe, valves, and other appurtenances connected to line pipe, pumping units, fabricated assemblies associated with pumping units, metering and delivery stations and fabricated assemblies therein, and breakout tanks.

12. Maximum Allowable Operating Pressure (MAOP): means the maximum pressure at which a pipeline or segment of a gas transmission pipeline may be operated under Title 49, Code of Federal Regulations, Part 192.

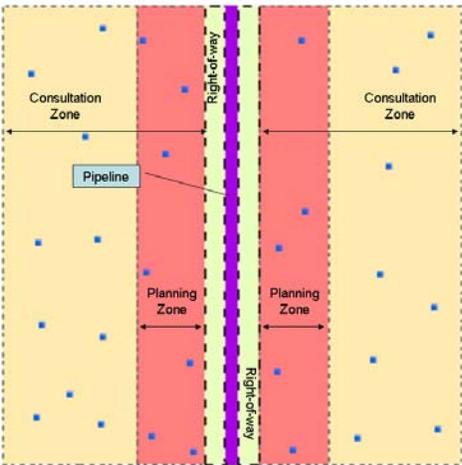
13. Maximum Operating Pressure (MOP) means the maximum pressure at which a hazardous liquid pipeline or segment of a pipeline may be normally operated under 49 CFR Part 195.

14. Nonconforming Use or Structure: A use or structure that is impermissible under current zoning restrictions but that is allowed because the use or structure existed lawfully before the restrictions took effect.

15. Person: Any individual, firm, joint venture, legal entity, partnership, corporation, association or cooperative, public or private.

16. PIPA Report: A document scheduled to be available in early 2010 through the U. S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) that provides recommended practices for land use and planning in the vicinity of transmission pipelines. The document is intended to be available on the PHMSA Pipeline Safety Stakeholder Communications web site. (<http://primis.phmsa.dot.gov/comm/LandUsePlanning.htm>)

- 17. Pipeline: means the same as is defined by Title 49, Code of Federal Regulations, Sections 195.2 and 192.3.
- 18. Pipeline Facility: means all parts of those physical facilities through which gas, hazardous liquids or carbon dioxide are moved in transportation as defined by 49 CFR Parts 192, 193 and 195.
- 19. Planning Zone: means an area around a transmission pipeline, based on characteristics of the pipeline and the surrounding area. The Planning Zone is a corridor in which risk-based land management decisions may have potential benefits in protecting pipelines, mitigating the immediate consequences of a pipeline incident, and facilitating emergency response to a potential transmission pipeline incident.



20. Potential impact radius (PIR) is defined as the radius of a circle within which the worst case failure of a gas transmission pipeline could have significant instantaneous impact on people or property not protected by structures or other obstructions. The PIR is calculated by the formula:

**$r = 0.69 * (\text{square root of } (p * d^2))$**

- 'r' is the radius of a circular area in feet surrounding the point on the pipeline of a potential failure
- 'p' is the pipeline's maximum allowable operating pressure (MAOP) in the pipeline segment in pounds per square inch
- 'd' is the nominal diameter of the pipeline in inches

The 0.69 factor is appropriate for natural gas pipelines. Different factors apply for other gases, depending upon their heat of combustion (see ASME B31.8-2004, Managing System Integrity of Gas Pipelines, 2005). Continued on page 24.00-6.

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Pipeline MAOP (psig)	Pipeline Diameter (inches)								
	6	8	10	12	16	24	30	36	42
200	59	78	98	117	156	234	293	351	410
400	83	110	138	166	221	331	414	497	580
600	101	135	169	203	270	406	507	608	710
800	117	156	195	234	312	468	585	703	820
1000	131	175	218	262	349	524	655	786	916
1200	143	191	239	287	382	574	717	860	1004
1400	155	207	258	310	413	620	775	929	1084

This table gives Planning Zone distances (in feet) for natural gas transmission lines, based on the PIR calculation for different combinations of pipeline diameters and MAOP. For example, a 30-inch pipeline with MAOP of 1,000 psig has a PIR of 655 feet. In this case, a Planning Zone extending 655 feet on either side of the pipeline could be defined.

21. Right-of-way (ROW): (1) A piece of property, usually consisting of a narrow, unobstructed strip or corridor of land of a specific width, which a pipeline company and the fee simple landowner both have legal rights to use and occupy. (2) A defined strip of land on which an operator has the right to construct, operate and maintain a pipeline. The operator may own a right-of-way outright or an easement may be acquired for specific use of the right-of-way.

22. Right-of-way agreement: See “*Easement*”

23. Rural: An area outside the limits of any incorporated or unincorporated city, town, village, or any other designated residential or commercial area such as a subdivision, a business or shopping center, or community development. (Reference 49 CFR 195.2)

24. South Dakota One Call: The South Dakota One Call system provides for communication between excavators and underground facility operators so buried utilities can be marked in advance of any digging. Following the One Call procedure works to reduce damages to underground infrastructure, helps to ensure public and worker safety, and protects the integrity of utility services. South Dakota Codified Law (SDCL) Chapter 49-7A authorizes the use of South Dakota One Call in South Dakota.

25. Transmission Pipeline: A pipeline, other than a gathering line, that transports gas or hazardous liquids from producing areas to refineries and processing facilities and then to consumer areas and local distribution systems.

**Establishment and Delineation of Transmission Risk Reduction Pipeline Overlay Zones**

Boundaries for the Transmission Pipeline Risk Reduction Overlay District are shown on published maps entitled "Brookings County Transmission Pipeline Risk Reduction Zone Map" dated November, 2009, as produced by Brookings County Geographic Information Systems (GIS). This map will be updated as needed. Said map is hereby adopted by reference as part of this ordinance as if the map is fully described herein. The Transmission Pipeline Risk Reduction Overlay District will be a computerized mapping file maintained by the Brookings County Geographic Information Systems specialist. The Overlay District will be utilized by the Planning and Zoning Office for the purpose of issuing building permits, conditional use permits, variances and enforcement of the Brookings County Zoning Ordinance and Brookings County Subdivision Ordinance. The pipeline information will not be available online.

The mapping data was derived from the National Pipeline Mapping System (NPMS), a geographic information system (GIS) created by the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS) in cooperation with other federal and state governmental agencies and the pipeline industry. Additional information was provided by local pipeline operator (s).

**Consultation Zone**

The purpose of the consultation zone is to identify the need for communication between property developers/owners within Brookings County and pipeline operators when new development is planned within 660' of an existing transmission pipeline. The Transmission Pipeline Risk Reduction Overlay District is designed to be a tool to identify where new development triggers the need for such consultation. The implementation of the consultation zone does not imply a previous lack of communication. The consultation zone dialogue will serve to: (1) protect pipelines by promoting adequate consideration of the potential safety impacts of the development on the transmission pipeline; and (2) raise awareness of the potential safety impacts of the pipeline on the development.

When a building permit is requested within the boundaries of the Transmission Pipeline Risk Reduction Overlay District, the person requesting a permit will be verbally informed that the building is being constructed near a transmission pipeline. A pipeline safety brochure will be provided along with the building permit. The permit office will notify the pipeline operator of the building permit request, the type and size of building. The property developer/owner is to initiate a consultation with the transmission pipeline operator as early as possible in the development planning process.

The consultation zone will be applied to the existing Northern Natural Gas Company pipeline, new transmission pipelines and any pipeline that requires a Conditional Use Permit (CUP) from the Brookings County Planning Commission. Transportation of gas from a methane digester to a manufacturing plant or transportation of natural gas to a power production plant are two examples of pipelines that require CUPs.

The consultation zone distance used in Brookings County is 660 feet for existing transmission pipelines. Future pipelines will be evaluated on a case by case basis to determine the potential impact radius (PIR). If the PIR is greater than 660', the PIR will be annotated on the findings of fact on the applicants CUP.

### **Planning Zone**

The purpose of the planning zone is to enforce the requirement for communication between property developers/owners within Brookings County and transmission pipeline operators when new development is planned within the planning zone distance of; (1) an existing natural gas transmission pipeline; or (2) a distance to be determined based on the site-specific and pipeline specific characteristics for future liquid pipelines. The Planning Zone is a tool to identify where new development requires a physical response. The Planning Zone is a corridor in which certain land management practices may have potential benefits in protecting pipelines, mitigating the immediate consequences of a pipeline incident, and facilitating emergency response to a potential transmission pipeline incident.

When an individual or organization requests a building permit and the location is within the Planning Zone then the permit office staff will request a detailed site plan. A hand rendered drawing will suffice. The building permit requestor will be given a brochure with the point-of-contact for the appropriate gas company's personnel and the recommended land management practices for new development near existing transmission pipelines. They will also be notified to contact the South Dakota One Call to have the pipeline located and marked prior to the issuance of a building permit. The individual or organization requesting the building permit must confirm or correct the actual location of the pipeline on the site drawing.

If excavation will occur completely outside of the right-of-way, a building permit will be issued. The pipeline operator will be notified that a building permit has been issued and will be provided with the location of the construction by the permit office.

If the actual excavation will occur inside the right-of-way, the developer must obtain a written, signed encroachment agreement from the pipeline operator. The encroachment agreement must be submitted to the building permit issuing office before a building permit will be issued. The pipeline operator will be notified that a building permit has been issued and will be provided with the

location of the construction by the permit office. A copy of the encroachment agreement will be kept on file in the permit office.

### **Planning Zone: Natural Gas**

#### Planning Zone Distance

The Planning Zone is determined on a case by case basis, depending upon the specific characteristics of the pipeline, such as the type of product, size of the pipe and Maximum Allowable Operating Pressure (MAOP):

In Brookings County the following distances will be utilized for existing pipelines;

Northern Natural Gas Company gas transmission lines, the planning zone distance is defined as 117 feet on either side of the pipeline.

Basin Electric gas transmission lines, the planning zone distance is defined as 262 feet on either side of the pipeline.

The Planning Zone distance for new facilities will be defined based on the potential impact radius (PIR) of the pipeline as these facilities are constructed.

### **Planning Zone: Liquid Pipelines**

Currently Brookings County is not aware of any hazardous liquid pipelines within its boundaries. The following actions would occur if hazardous liquid pipelines would be located in Brookings County at any time.

Determining the appropriate Planning Zone distance for a hazardous liquid pipeline is potentially much more complex because of the varying flow characteristics of released liquids and the effect of the terrain surrounding the pipeline on the path of the release. Assembling the information and analysis needed to define the planning zone should be a collaborative effort by the pipeline operator and local government.

A planning distance for liquid pipelines may be defined based on a pipeline- and location-specific analysis considering the following three elements:

- *How much liquid might be spilled?*
- *Where would the spilled liquid go?*
- *What locations would be impacted?*

The fundamental factors to be considered in an analysis to establish the planning zone distance for liquid pipelines are listed below.

*“How much liquid might be spilled?”*

- Can be derived from pipeline flow rates, spill detection time, pipeline shutdown time, and drain down volume from various locations along the pipeline (this information can be obtained from the pipeline operator).

*“Where would the spilled liquid go?”*

- Overland flow:
  - Soil cover type / vegetation (flow resistance)
  - Soil absorption / permeability (seepage and retention)
  - Topography / contour / digital elevation model (direction of flow, speed of flow, retention areas and volumes)
  - Drainage systems such as culverts, streams, gullies, farm tiles, roadside ditches
  - Flow barriers such as railroad and road embankments, curbs, dikes, bulkheads
  - Fluid properties such as viscosity, density, vapor pressure
- Vapor cloud extent, if any – especially for highly volatile liquid pipelines
  - Heavier than air vapors settling in low spots
  - Vapor dispersion – dangerous for how far downwind?

*“What locations would be impacted?”*

- Thermal impact from fire
- Blast overpressure from explosion,
- Toxic, asphyxiation effects, etc.,
- Environmental effects from spill

Various models have been developed to support an analysis based on these elements. Each must consider a multitude of site-specific factors, which should be evaluated in their as-modified (i.e. post-development) condition. When using such models the model should be fit-for-purpose and the user should have expertise in hazard analysis. As noted, assembling the information and analysis needed to define the planning zone would be a collaborative effort by the pipeline operator and local government.

### **Severability**

Should any article, section or provision of this ordinance be declared invalid, such decision shall not affect the validity of this ordinance as a whole or any other part thereof.