B. The County Zoning Commission may impose, in addition to the standards and requirements set forth in these regulations, additional conditions which the County Zoning Commission considers necessary to protect the public health, safety and welfare.

C. Conditional Uses shall be in effect only as long as sufficient land specified for spreading purposes is available for such purposes and other provisions of the permit are being adhered to.

D. When considering an application, the County Zoning Commission will take into consideration current and past violations relating to Concentrated Animal Feeding Operations that the applicant has an interest in.

E. The permit holder shall provide and at all times maintain General Liability insurance in the amount of at least $1,000,000.00, with an Environmental Protection Insurance rider of at least $100,000.00. Proof of such insurance must be received prior to the issuance of a permit and must be provided annually during the operation of such CAFO. The insurance carrier shall be required to provide Brookings County with notice of insurance and with a notice of cancellation or change in coverage. Failure to maintain such insurance shall be grounds for cancellation of the Conditional Use Permit. (Ord. 2006-02, 3-28-2006).

F. Permit applicants will be required to file a letter of assurances as required by the County Zoning Commission. The letter of assurances will be prepared by the zoning officer and signed by both the applicant and the zoning officer.

G. In the event of a discharge (as defined by SDCL 34A-2B-1) of manure or other materials or wastes associated with a CAFO, the permit holder shall cooperate fully with and comply with all requirements of the South Dakota Department of Environment and Natural Resources and such permit holder shall take all steps necessary to clean up and eliminate such discharge at the sole expense of the permit holder and/or its insurance carrier. Failure to comply with the requirements of this paragraph shall be grounds for cancellation of the Conditional Use Permit. (Ord. 2006-02, 3-28-2006).

H. The permit holder shall at all times properly dispose of dead livestock consistent with the rules, regulations and directives of the South Dakota Animal Industry Board of the Department of Agriculture. Failure to comply with such rules, regulations or directives shall be grounds for cancellation of the Conditional Use Permit. (Ord. 2006-02, 3-28-2006).

I. The permit holder shall notify Brookings County in writing in the event of closure of the animal confinement operation. Included in the notification shall be: plans for cleaning the buildings, waste system and emptying of the holding pond, storage pit or lagoon. (Ord. 2006-02, 3-28-2006).

8. Information Required for Class A and B Concentrated Feeding Operation Permit.

   A. Owner's name, address and telephone number.

   B. Legal descriptions of site and site plan.

   C. Number and type of animals.

   D. Nutrient management plan.

   E. Manure management and operation plan.

   F. Management Plan for Fly and Odor Control.

   G. Information on ability to meet designated setback requirements including site plan to scale.

   H. General permits from South Dakota Department of Environment & Natural Resources if available for animal species.

   I. Review of Plans and Specifications and Nutrient Management Plan by the South Dakota Department of Environment & Natural Resources.

   J. Information on soils, shallow aquifers, designated wellhead protection areas, and 100-year flood plain designation.

   K. Notification of whoever maintains the access road (township, county and state). Notification of public water supply officials

   L. Any other information as contained in the application and requested by the County Zoning Officer.

9. Information Required for Class C and D Concentrated Feeding Operation Permit.

   A. Owner's name, address and telephone number.

   B. Legal descriptions of site and site plan.

C. Number and type of animals.

D. Nutrient management plan.

E. Manure management and operation plan.

F. Management Plan for Fly and Odor Control.

G. Information on ability to meet designated setback requirements including site plan to scale.

H. Review of Plans and Specifications and Nutrient Management Plan by the South Dakota Department of Environment & Natural Resources if using lagoon or earthen storage basin.

I. Information on soils, shallow aquifers, designated wellhead protection areas, and 100-year floodplain designation.

J. Notification of whoever maintains the access road (township, county and state). Notification of public water supply officials

K. Any other information as contained in the application and requested by the County Zoning Officer.

ARTICLE 23.00
WIND ENERGY SYSTEM (WES) REQUIREMENTS

Section 23.01. Wind Energy System (WES) Requirements (Ord. 2001-03, 10-02-2001)

A. Applicability

The requirements of these regulations shall apply to all WES facilities except private facilities with a single tower height of less than seventy-five (75) feet and used primarily for on-site consumption of power.

B. Federal and State Requirements

All WES shall meet or exceed standards and regulations of the Federal Aviation Administration and South Dakota State Statutes and any other agency of federal or state government with the authority to regulate WES.

C. Definitions

Construction. "Construction" means any clearing of land, excavation, or other action that would adversely affect the natural environment of the site or route but does not include changes needed for temporary use of sites or routes for non- utility purposes, or uses in securing survey or geological data, including necessary borings to ascertain foundation conditions.

High voltage transmission line. "High voltage transmission line" means a conductor of electric energy and associated facilities.

Large electric power facilities. "Large electric power facilities" means high voltage transmission lines.

Person. "Person" shall mean an individual, partnership, joint venture, private or public corporation, association, firm, public service company, cooperative, political subdivision, municipal corporation, government agency, public utility district, or any other entity, public or private, however organized.

Route. "Route" means the location of a high voltage transmission line between two end points. The route may have a variable width of up to 1.25 miles.

Utility. "Utility" shall mean any entity engaged in this state in the generation, transmission or distribution of electric energy including, but not limited to, a private investor owned utility, cooperatively owned utility, and a public or municipally utility.

D. GENERAL PROVISIONS

1. Mitigation Measures

a. Site Clearance. The permittees shall disturb or clear the site only to the extent necessary to assure suitable access for construction, safe operation and maintenance of the WES.

b. Topsoil Protection. The permittees shall implement measures to protect and segregate topsoil from subsoil in cultivated lands unless otherwise negotiated with the affected landowner.

c. Compaction. The permittees shall implement measures to minimize compaction of all lands during all phases of the project's life and shall confine compaction to as small an area as practicable.

d. Livestock Protection. The permittees shall take precautions to protect livestock during all phases of the project's life.

e. Fences. The permittees shall promptly replace or repair all fences and gates removed or damaged during all phases of the project's life unless otherwise negotiated with the affected landowner.

f. Roads

(1) Public Roads. Prior to commencement of construction, the permittees shall identify all state, county or township "haul roads" that will be used for the WES project and shall notify the state, county or township governing body having jurisdiction over the roads to determine if the haul roads identified are acceptable. The governmental body shall be given adequate time to inspect the haul roads prior to use of these haul roads. Where practical, existing roadways shall be used for all activities associated with the WES. Where practical, all-weather roads shall be used to deliver concrete,

turbines, towers, assemble nacelles and all other heavy components to and from the turbine sites.

The permittees shall, prior to the use of approved haul roads, make satisfactory arrangements with the appropriate state, county or township governmental body having jurisdiction over approved haul roads for construction of the WES for the maintenance and repair of the haul roads that will be subject to extra wear and tear due to transportation of equipment and WES components. The permittees shall notify the County Zoning Office of such arrangements.

(2) Turbine Access Roads. Construction of turbine access roads shall be minimized. Access roads shall be low profile roads so that farming equipment can cross them and shall be covered with Class 5 gravel or similar material. When access roads are constructed across streams and drainage ways, the access roads shall be designed in a manner so runoff from the upper portions of the watershed can readily flow to the lower portion of the watershed.

(3) Private Roads. The permittees shall promptly repair private roads or lanes damaged when moving equipment or when obtaining access to the site, unless otherwise negotiated with the affected landowner.

(4) Control of Dust. The permittees shall utilize all reasonable measures and practices of construction to control dust.

g. Soil Erosion and Sediment Control Plan. The permittees shall develop a Soil Erosion and Sediment Control Plan prior to construction and submit the plan to the County Zoning Office. The Soil Erosion and Sediment Control Plan shall address the erosion control measures for each project phase, and shall at a minimum identify plans for grading, construction and drainage of roads and turbine pads; necessary soil information; detailed design features to maintain downstream water quality; a comprehensive revegetation plan to maintain and ensure adequate erosion control and slope stability and to restore the site after temporary project activities; and measures to minimize the area of surface disturbance. Other practices shall include containing excavated material, protecting exposed soil,

stabilizing restored material and removal of silt fences or barriers when the area is stabilized. The plan shall identify methods for disposal or storage of excavated material.

2. Setbacks

   Wind turbines shall meet the following minimum spacing requirements.

   a. Distance from existing off-site residences, business and public buildings shall be one thousand (1,000) feet. Distance from on-site or lessor's residence shall be one thousand (1,000) feet. (Ord. 2005-01, 1-25-2005)

   b. Distance from right-of-way (ROW) of public roads shall be 500 feet or one point one (1.1) times the height of the wind turbines depending upon which is greater, measured from the ground surface to the tip of the blade when in a fully vertical position. (Ord. 2005-01, 1-25-2005)

   c. Distance from any property line shall be 500 feet or one point one (1.1) times the height of the wind turbines depending upon which is greater, measured from the ground surface to the tip of the blade when in a fully vertical position unless wind easement has been obtained from adjoining property owner. (Ord. 2005-01, 1-25-2005)

3. Electromagnetic Interference. The permittees shall not operate the WES so as to cause microwave, television, radio, or navigation interference contrary to Federal Communications Commission (FCC) regulations or other law. In the event such interference is caused by the WES or its operation, the permittees shall take the measures necessary to correct the problem.

4. Lighting. Towers shall be marked as required by the Federal Aviation Administration (FAA). There shall be no lights on the towers other than what is required by the FAA. This restriction shall not apply to infrared heating devices used to protect the monitoring equipment.

5. Turbine Spacing. The turbines shall be spaced no closer than three (3) rotor diameters (RD) measurement of blades tip to tip. If required during final micro siting of the turbines to account for topographic conditions, up to 10 percent of the towers may be sited closer than the above spacing but the permittees shall minimize the need to site the turbines closer.

6. Footprint Minimization. The permittees shall design and construct the WES so as to minimize the amount of land that is impacted by the WES. Associated facilities in the vicinity of turbines such as electrical/electronic boxes, transformers and monitoring systems shall to the greatest extent feasible be mounted on the foundations used for turbine towers or inside the towers unless otherwise negotiated with the affected landowner.

7. Electrical Cables. The permittees shall place electrical lines, known as collectors, and communication cables underground when located on private property. Collectors and cables shall also be placed within or immediately adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner. This paragraph does not apply to feeder lines.

8. Feeder Lines. The permittees shall place overhead electric lines, known as feeders, on public rights-of-way if a public right-of-way exists. Changes in routes may be made as long as feeders remain on pubic rights-of-way and approval has been obtained from the governmental unit responsible for the affected right-of-way. If no public right-of-way exists, the permittees may place feeders on private property. When placing feeders on private property, the permittees shall place the feeder in accordance with the easement negotiated with the affected landowner. The permittees shall submit the site plan and engineering drawings for the feeder lines before commencing construction.

9. Decommissioning/Restoration/Abandonment

    a. Decommissioning Plan. Within 120 days of completion of construction, the permittees shall submit to the County Zoning Office a decommissioning plan describing the manner in which the permittees anticipate decommissioning the project in accordance with the requirements of paragraph (b) below. The plan shall include a description of the manner in which the permittees will ensure that it has the financial capability to carry out these restoration requirements when they go into effect. The permittees shall ensure that it carries out its obligation to provide for the resources necessary to fulfill these requirements. The County Zoning Office may at any time request the permittees to file a report with the County Zoning Office describing how the permittees are fulfilling this obligation.

b. Site Restoration. Upon expiration of this permit, or upon earlier termination of operation of the WES, the permittees shall have the obligation to dismantle and remove from the site all towers, turbine generators, transformers, overhead and underground cables, foundations, buildings and ancillary equipment to a depth of four feet. To the extent possible the permittees shall restore and reclaim the site to its pre-project topography and topsoil quality. All access roads shall be removed unless written approval is given by the affected landowner requesting that one or more roads, or portions thereof, be retained. Any agreement for removal to a lesser depth or for no removal shall be recorded with the County Zoning Office and shall show the locations of all such foundations. All such agreements between the permittees and the affected landowner shall be submitted to the County Zoning Office prior to completion of restoration activities. The site shall be restored in accordance with the requirements of this condition within eighteen months after expiration.

c. Abandoned Turbines. The permittees shall advise the County Zoning Office of any turbines that are abandoned prior to termination of operation of the WES. The County Zoning Office may require the permittees to decommission any abandoned turbine.

10. Height from Ground Surface. The minimum height of blade tips, measured from ground surface when a blade is in fully vertical position, shall be twenty-five (25) feet.

11. Towers.

    a. Color and Finish. The finish of the exterior surface shall be non-reflective and non-glass.

    b. All towers shall be singular tubular design.

12. Noise. Noise level shall not exceed 50 dBA, including constructive interference effects at existing off-site residences, businesses, and public buildings. (Ord. 2006-02, 3-28-2006).

13. Permit Expiration. The permit shall become void if no substantial construction has been completed within three (3) years of issuance.

14. Required Information for Permit.

    a. Boundaries of the site proposed for WES and associated facilities on United States Geological Survey Map or other map as appropriate.

    b. Map of easements for WES.

    c. Map of occupied residential structures, businesses and public buildings.

    d. Map of sites for WES, access roads and utility lines.

    e. Location of other WES in general area.

    f. Project schedule.

    g. Mitigation measures.

ARTICLE 24.00
TRANSMISSION PIPELINE RISK REDUCTION OVERLAY DISTRICT

Section 24.01: Land Use in Transmission Pipeline Overlay District (Ord. 2009-01, 11-17-2009.

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

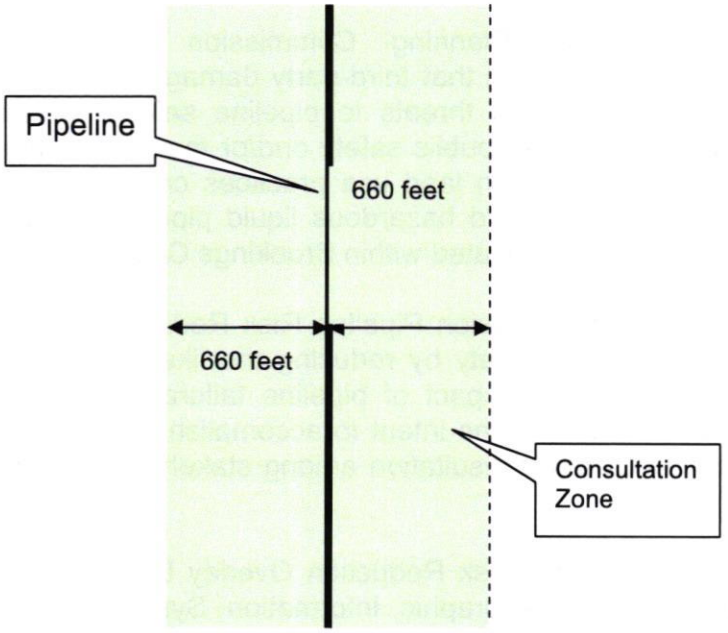
gas transmission pipelines, and pipelines which transport gas from methane digesters but will exclude gas gathering or distribution pipelines.

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 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.

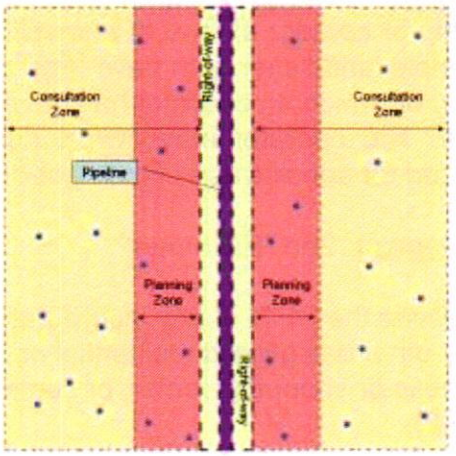
15. Person: Any individual, firm, joint venture, legal entity, partnership, corporation, association or cooperative, public or private.

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* (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.

Continued from page 24.00-5.

Pipeline MAOP (psig)	Pipeline Diameter (inches) 6	8	10	12	16	24	30	36	42
	Planning Zone (PIR in feet)								
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

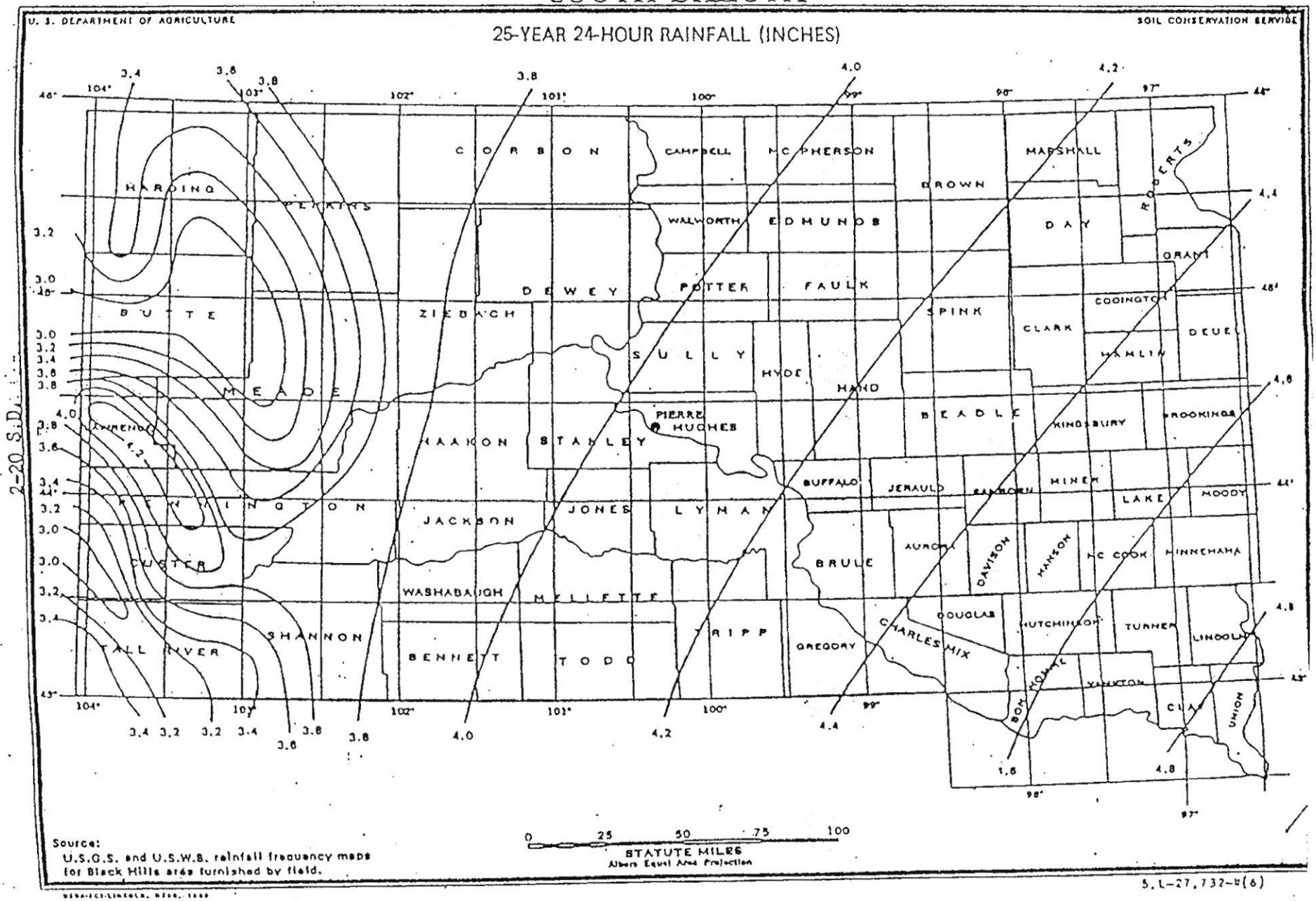
Should any article, section or provision of this ordinance be declared invalid, such decision shall not affect the validity of this ordinance as a whole or any other part thereof.

APPENDIX A

25-Year, 24-Hour Rainfall Map

For South Dakota

SOUTH DAKOTA



APPENDIX 1

Natural Resource Conservation Service South Dakota
Engineering Standard, Waste Storage Ponds 425
Has been replaced by:

Natural Resource Conservation Service

Conservation Practice Standard

Waste Storage Facility (No.) Code 313

Current as of: October 2006

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

WASTE STORAGE FACILITY

(No.)

CODE 313

DEFINITION

A waste storage impoundment made by constructing an embankment and/or excavating a pit or dugout, or by fabricating a structure.

PURPOSE

To temporarily store wastes such as manure, wastewater, and contaminated runoff as a storage function component of an agricultural waste management system (AWMS).

CONDITIONS WHERE PRACTICE APPLIES

Where the storage facility is a component of a planned AWMS.

Where temporary storage is needed for organic wastes generated by agricultural production or processing.

Where the storage facility can be constructed, operated, and maintained without polluting air or water resources.

Where site conditions are suitable for construction of the facility.

To facilities utilizing embankments with an effective height of 35 feet or less where damage resulting from failure would be limited to damage of farm buildings, agricultural land, or township and country roads.

To fabricated structures including tanks, stacking facilities, pond appurtenances, and roof structures.

This practice does not apply to storage of human domestic sewage or wastewater.

CRITERIA

General Criteria Applicable to All Waste Storage Facilities.

Laws and Regulations. Waste storage facilities must be planned, designed, and constructed to meet all federal, state, and local laws and regulations.

Where South Dakota Department of Environment and Natural Resources (SD DENR) approval is to be obtained, SD DENR requirements must be met.

South Dakota dam safety requirements shall be met for construction of facilities utilizing embankments.

Location. Waste storage facilities shall not be located within the 100-year frequency flood plain unless the structure is protected from inundation and damage that may occur during the 100-year frequency flood event.

Waste storage facilities or manure and wastewater disposal sites cannot be located closer than 1,000 feet from an existing public water well or drinking water source nor 250 feet from a well or drinking water source not owned by the producer.

Waste storage facilities or manure and wastewater disposal sites shall not be located closer than 150 feet from a water well or drinking water source that is owned by the producer.

Waste storage facilities shall be located so the potential impacts from breach of embankment, accidental release, and liner failure are minimized; and separation distances are such that prevailing winds and landscape elements such as building arrangement, landforms, and

vegetation minimize odors and protect aesthetic values.

Storage Period. The storage period is the maximum length of time anticipated between emptying events. The minimum storage period shall be based on the timing required for environmentally safe waste utilization considering the climate, crops, soil, equipment, and local, state, and federal regulations.

Storage facilities that receive drainage from open lots must store at least 365 days of manure, wastewater, and contaminated runoff produced by the livestock operation. Storage facilities that do not receive drainage from open lots must store at least 270 days of manure and wastewater, except facilities emptied only once per year must store at least one-year of waste.

Design Storage Volume. Design storage volume shall consist of the total of the following as appropriate:

Residual volume after liquids have been removed. A minimum of 6 inches shall be provided for tanks and 12 inches for all facilities constructed of earthen materials;

Manure, wastewater, and other wastes accumulated during the storage period;

Normal runoff from the facility's drainage area during the storage period less evaporation calculated on the surface of the pond at the average active storage depth (depth midway between the top of the residual and the maximum operating level) during the storage period;

Average annual precipitation falling on the area inside the top of the structure embankment;

Waste storage facilities for animal feeding operations that commenced construction (or had significant expansion) after February 12, 2003, that require permitting through SD DENR, and that involve waste from swine, poultry or veal, must contain the 100-year frequency, 24-hour duration runoff without discharge. Storage capacity for the 100-year frequency, 24-hour duration storm precipitation on the surface area inside the tops of the containment dikes must also be contained for these systems;

For other waste storage facilities, include the 25-year frequency, 24-hour duration precipitation runoff (if the structure receives runoff from an open lot or other drainage area), and the depth of the 25-year frequency, 24-hour duration storm precipitation on the surface area inside the tops of the containment dikes; additional storage as may be required to meet management goals or regulatory requirements (including freeboard).

Note - Uncontaminated storm water runoff shall be diverted away from the facility wherever possible.

Freeboard. Design depth for waste storage facilities constructed of earthen materials must include at least two feet of freeboard, except one foot of freeboard may be used for small ponds that do not have significant contributing drainage areas and that will not need SD DENR review or approval.

Fabricated structure design depth must include at least six inches of freeboard.

Maximum Operating Level. The maximum operating level for waste storage facilities shall be the level that provides the volume required by the first four paragraphs under Design Storage Volume.

A permanent marker or recorder shall be installed at this maximum operating level to indicate when drawdown should begin. The marker or recorder shall be referenced and explained in the Operation and Maintenance (O&M) plan.

Active Storage Volume. The active storage volume is defined as the volume at maximum operating level minus residual volume (first paragraph under Design Storage Volume). Active storage depth is defined as the pond depth at maximum operating level minus the depth required for residual volume.

Volume Reduction by Evaporation. Waste Storage Facilities designed to emphasize significant reduction of liquid volume through evaporation must only contain contaminated liquid (not solids). Manure or other solid wastes must be stored in a separate waste

storage facility. A sediment basin or other solids removal method must be used to minimize entry of solids into the evaporation facility.

Dimensions of the evaporation facility will be determined by evaluating the expected annual runoff from the contributing area, the annual rainfall on the pond, and the expected annual evaporation calculated on the surface area at the average active storage depth (see the third paragraph under Design Storage Volume).

Active storage volume for evaporation designs must contain the average annual runoff and precipitation minus the mean annual shallow lake evaporation over a minimum period of five years. A minimum of one-foot of depth must be provided above the residual depth and below the maximum operating level.

The (Design Storage Volume) requirements to provide storage for large storm events above the maximum operating level and to provide freeboard also apply to facilities emphasizing evaporation.

Recommended Minimum Liquid Surface Area for Evaporation Facilities.

Average Annual Precipitation, inches	Ratio, pond bottom area / drainage area
<18"	0.12
18"-20"	0.15
20"-22"	0.18
22"-24"	0.22
24"-26"	0.30
>26"	0.33

The O&M plan for each evaporation facility shall include specific language to explain that pumping (partial emptying) will be necessary to maintain required storage capacity during periods of wet climatic conditions. The O&M Plan should also address maintaining the moisture content of the bottom and inner side slopes of the facility during drought to reduce cracking and future seepage losses.

Inlet. Inlets shall be of any permanent type designed to resist corrosion, plugging, freeze damage, and ultraviolet ray deterioration while incorporating erosion protection as necessary.

For inlets carrying solids, the inlet should be designed to deposit waste near the center of the side of the waste storage facility. Minimum pipe diameter shall be 10 inches except as recommended by equipment manufacturers. The preferred pipe slope for gravity flow is one percent. Flatter slopes may be used where provisions are made to clear blockages.

Emptying Component. Some type of component shall be provided for emptying storage facilities. It may be a facility such as a gate, pipe, dock, wet well, pumping platform, retaining wall, or ramp. Features to protect against erosion, tampering, and accidental release shall be incorporated as necessary.

Accumulated Solids Removal. Provision shall be made for periodic removal of accumulated solids to preserve storage capacity. The anticipated method for doing this must be considered in planning, particularly in determining the configuration of ponds and type of seal, if any.

Safety. Design shall include appropriate safety features to minimize the hazards of the facility. Ramps used to empty liquids shall have a slope of four horizontal to one vertical or flatter. Those used to empty slurry, semi-solid, or solid waste shall have a slope of 10 horizontal to 1 vertical or flatter unless special traction surfaces are provided.

Warning signs, fences, ladders, ropes, bars, rails, and other devices shall be provided, as appropriate, to ensure the safety of humans and livestock. Ventilation and warning signs must be provided for covered waste holding structures, as necessary, to prevent explosion, poisoning, or asphyxiation. Pipelines shall be provided with a water-sealed trap and vent, or similar device, if there is a potential, based on design configuration, for gases to enter buildings or other confined spaces. Gravity discharge pipes used for emptying a storage/treatment facility shall have a minimum of two gates or valves, one of which shall be manually operated.

Ponds and uncovered fabricated structures for liquid or slurry waste with walls less than five

feet above ground surface shall be fenced and warning signs posted to prevent children and others from using them for other than their intended purpose.

Erosion Protection. Embankments and disturbed areas surrounding the facility shall be seeded or otherwise treated to control erosion.

Clay Liners. Clay liners must be at least 18 inches thick and compacted to at least 95 percent of standard maximum dry unit weight, and at water content within 2 percent of optimum as determined by ASTM D698. Where SD DENR approval will be obtained, the compacted clay liner must meet SD regulatory requirements.

Flexible Membranes. Flexible membranes must be designed to be waterproof (including seams) and must be designed for permanent exposure to ag waste, soils, and sunlight. Flexible membranes must meet the minimum requirements contained in the NRCS Practice Standard Pond Sealing or Lining – Flexible Membrane (521A). Thicker membranes may be required by state or local government regulatory agencies.

Livestock Access. Livestock shall be prohibited access to the interior of waste storage facilities, with the exception of the interior of roofed structures that are used to provide a portion of the required waste storage capacity.

Waste Stockpiling Outside Feedlots. Stockpiling sites must follow requirements of SD DENR General Water Pollution Control Permit for Concentrated Animal Feeding Operations.

Groundwater Monitoring. Where waste storage facilities are located over shallow aquifers or where discharge to groundwater may occur, regularly sampled groundwater monitoring wells or a Groundwater Discharge Permit may be required. For each affected site, these requirements will be as specified by the SD DENR.

Additional Criteria for Waste Storage Ponds

Soil and foundation. The pond shall be located in soils with an acceptable permeability that meets all applicable regulation, or the pond shall be lined. Information and guidance on controlling seepage from waste impoundments can be found in the Agricultural Waste Management Field Handbook (AWMFH), Appendix 10D.

The pond shall have a bottom elevation that is a minimum of two feet above the seasonal high water table unless features of special design are incorporated that address buoyant forces, pond seepage rate, and non-encroachment of the water table by contaminants. The water table may be lowered by use of perimeter drains, if feasible, to meet this requirement.

An onsite soils investigation shall be conducted in sufficient detail to determine:

The soil type(s), based on the Unified Soil Classification System;

The need for and extent of seepage control measures required;

Embankment and liner design parameters;

The location of the seasonal high water table, when one is present;

That SD DENR requirements have been met (where applicable);

Soils information must be obtained to a minimum depth of two feet below the bottom of the proposed storage facility.

Outlet. No outlet shall automatically release storage from the required design volume. Manually operated outlets shall be of permanent type designed to resist corrosion and plugging.

Embankments. The minimum elevation of the top of the settled embankment shall be one foot above the waste storage pond's required volume. Required fill height shall be increased by the amount needed to ensure that the top elevation will be maintained after settlement.

Where required compaction is less than 95 percent of ASTM D698 standard maximum dry unit weight, the fill height increase for settlement shall not be less than five percent. Minimum freeboard for facilities permitted by SD DENR must meet state regulations.

Earth embankment slopes must be designed to be stable and must be three horizontal to one vertical or flatter.

The minimum top widths are shown in Table 1.

Table 1 – Minimum Top Widths

Total Embankment Height at Centerline, ft feet	Top Width, feet
19.9 or less	10
20–24.9	12
25–29.9	14
30–35	15

Note - SD DENR may require other top widths.

Excavations. Unless supported by a soil investigation, excavated side slopes shall be no steeper than two horizontal to one vertical.

Wind and Wave Protection. Erosion protection shall be provided for earthen waste storage facilities having a five-acre or larger liquid surface at maximum operating level.

Additional Embankment Criteria for Storage Ponds Receiving Runoff from Contributing Drainage Areas.

Additional embankment overtopping protection must be provided for embankment storage ponds that receive runoff from contributing drainage areas. Overtopping protection may take the form of embankment armoring, additional storage capacity or an auxiliary spillway.

Where designs include auxiliary spillways, the crest of the auxiliary spillway must be at least one foot above design storage elevation, and settled embankment top elevation must be at least 1 foot above the water surface during passage of runoff from the 25-year frequency, 24-hour duration storm occurring when the design volume is filled. The auxiliary spillway may be a channel, chute structure, drop structure, or overflow pipe. Earthen channel auxiliary spillways must have four foot minimum bottom width. Chute and drop structure spillways must have four foot minimum weir width. Overflow pipes must have six inch minimum nominal diameter. Auxiliary spillway outflows must not be directed onto property not owned by the owner/operator, within 250 feet of the structure.

All embankment storage ponds without an auxiliary spillway must have settled embankment top elevation a minimum of one foot above design storage volume, and must not be overtopped by the runoff from a 25-year frequency, 24-hour duration storm occurring when the design storage volume is filled.

Minimum freeboard for facilities permitted by SD DENR must also meet state regulations.

Additional Criteria for Roofed Animal Production Facilities Utilized to Minimize Contaminated Runoff

When a roof structure is used to eliminate contaminated runoff, the structure shall be designed to prevent manure under the roof from becoming a pollution problem. Roofs shall be designed for the snow and wind loads found in the local building code.

Building Structural Requirements. All foundation or structural components will meet the requirements contained in this standard under "Criteria for Fabricated Structures."

The design and construction of the roof structure shall be approved and sealed by a professional engineer licensed to practice engineering in the state of SD.

Design Storage Volume. It is recognized that the floor area of these facilities will provide some portion of the overall waste storage capacity. The minimum required capacity for process generated wastes associated with this type facility will be 270 days. Storage capacity for manure and bedding shall be provided within the roofed structure and/or other storage facilities that will meet all minimum requirements of this standard. Storage facilities that are exposed to direct precipitation will meet all minimum requirements for storage capacity defined elsewhere in this standard for waste storage ponds.

Roofed Structure Floor Requirements. For floor slabs constructed with concrete, the minimum thickness of the slab on uniform foundations shall be five inches and shall contain distributed reinforcing steel.

In order to control seepage, the concrete slab shall be constructed with water stops in all construction joints or placed over a twelve inch

thick compacted clay lining designed according to procedures in the AWMFH, Chapter 10, Appendix 10D. A minimum four-inch thick layer of sand and gravel shall be utilized above the clay lining to minimize the potential for cracking of the concrete due to moisture or frost heaving.

Flexible impermeable membranes may be utilized in place of the compacted clay lining beneath a concrete floor. Flexible membranes must meet the minimum requirements contained in the NRCS Practice Standard Pond Sealing or Lining – Flexible Membrane (521A). A minimum 16-inch thick layer consisting of a 12-inch thick layer of earthen materials placed above the membrane and 4 inches of sand and gravel immediately below the concrete shall be utilized for protection of the membrane during concrete placement.

For roof structure floors constructed of earthen materials, an18-inch thick compacted clay lining designed according to procedures in the AWMFH, Chapter 10, Appendix 10D, will be utilized to control seepage from the floor used as a waste storage area. A 12-inch thick layer of compacted earthen material over a flexible membrane may also be used. Provisions for maintaining the integrity of the clay lining or impermeable membrane will be included in the O&M plan for the facility.

Nutrient Management. A Comprehensive Nutrient Management Plan which will meet the Conservation Practice Standard Nutrient Management (590) will be developed and implemented as a part of the roofed structure system of components for waste storage.

Additional Criteria for Fabricated Structures

Foundation. The foundations of fabricated waste storage structures shall be proportioned to safely support all superimposed loads without excessive movement or settlement.

Where a non-uniform foundation cannot be avoided or applied loads may create highly variable foundation loads; settlement should be calculated from site-specific soil test data. Index tests of site soil may allow correlation with similar soils for which test data is available. If no test data is available, presumptive bearing strength values for assessing actual bearing pressures may be obtained from Table 2 or another nationally recognized building code. In using presumptive bearing values, adequate detailing and articulation shall be provided to avoid distressing movements in the structure.

Foundations consisting of bedrock with joints, fractures, or solution channels shall be treated or a separation distance provided consisting of a minimum of one foot of impermeable soil between the floor slab and the bedrock or an alternative that will achieve equal protection.

Table 2 - Presumptive Allowable Bearing Stress Values[1]/

Foundation Description	Allowable Stress
Crystalline Bedrock	12000 psf
Sedimentary Rock	6000 psf
Sandy Gravel or Gravel	5000 psf
Sand, Silty Sand, Clayey Sand, Silty Gravel, Clayey Gravel	3000 psf
Clay, Sandy Clay, Silty Clay, Clayey Silt	2000 psf

[1]/ Basic Building Code, 12th Edition, 1993, Building Officials and Code Administrators, Inc. (BOCA)

Liquid Tightness. Applications such as tanks that require liquid tightness shall be designed and constructed in accordance with standard engineering and industry practices to achieve liquid tightness.

Structural Loadings. Waste storage structures shall be designed to withstand all anticipated loads including internal and external loads, hydrostatic uplift pressure, concentrated surface and impact loads, water pressure due to seasonal high water table, and frost or ice pressure and load combinations in compliance with this standard and applicable local building codes.

Lateral earth pressures should be calculated from soil strength values determined from the results of appropriate soil tests. Lateral earth pressures can be calculated using the procedures in Natural Resources Conservation Service Technical Release 74, Lateral Earth Pressures, (TR-74). If soil strength tests are not available, the presumptive lateral earth

pressure values indicated in Table 3 shall be used.

Lateral earth pressures based upon equivalent fluid assumptions shall meet the following:

Rigid frame or restrained wall. Use the values shown in Table 3 under the column "Frame tanks," which gives pressures comparable to the at-rest condition.

Flexible or yielding wall. Use the values shown in Table 3 under the column "Free-standing walls," which gives pressures comparable to the active condition. Walls in this category are designed on the basis of gravity for stability or are designed as a cantilever having a base wall thickness to height of backfill ratio not more than 0.085.

Equivalent fluid pressures lower than 60 lbs./ft.^{2}/ft. depth, are appropriate for design only where excellent drainage is provided for backfill.

Internal lateral pressure used for design shall be 65 lb/ft^2 where the stored waste is not protected from precipitation. A value of 60 lb/ft^2 may be used where the stored waste is protected from precipitation and will not become saturated. Lesser values may be used if supported by measurement of actual pressures of the waste to be stored. If heavy equipment will be operated near the wall, an additional two feet of soil surcharge shall be considered in the wall analysis.

Tank covers shall be designed to withstand both dead and live loads. The live load values for covers contained in ASAE EP378.3, Floor and Suspended Loads on Agricultural Structures Due to Use, and in ASAE EP 393.2, Manure Storages, shall be the minimum used. The actual axle load for tank wagons having more than a 2,000 gallon capacity shall be used.

If the facility is to have a roof, snow, and wind loads shall be as specified in ASAE EP288.5, Agricultural Building Snow and Wind Loads. If the facility is to serve as part of a foundation or support for a building, the total load shall be considered in the structural design.

Structural Design. The structural design shall consider all items that will influence the performance of the structure, including loading assumptions, material properties, and construction quality. Design assumptions and construction requirements shall be indicated on standard plans.

Tanks may be designed with or without covers. Covers, beams, or braces that are integral to structural performance must be indicated on the construction drawings. The openings in covered tanks shall be designed to accommodate equipment for loading, agitating, and emptying. These openings shall be equipped with grills or secure covers for safety, and for odor and vector control.

All structures shall be underlain by free draining material or shall have a footing located below the anticipated frost depth.

A single layer of steel placed near the center of the slab or wall may be used for members that are not more than eight inches thick.

Trusses delivered to job site shall be accompanied with a certification stamped by a professional engineer showing that the truss design conforms to this standard for the building dimension shown on the drawings.

Fabricated structures shall be designed according to the criteria in the following references as appropriate:

Steel: "Manual of Steel Construction," American Institute of Steel Construction.

Timber: "National Design Specifications for Wood Construction," American Forest and Paper Association.

Concrete: "Building Code Requirements for Reinforced Concrete, ACI 318," American Concrete Institute.

Masonry: "Building Code Requirements for Masonry Structures, ACI 530," American Concrete Institute.

Midwest Plan Service (MWPS-36) Concrete Manure Storage Handbook available from the Extension Service.

Slabs on Grade. Slab design shall consider required performance and the critical applied loads along with both the subgrade material and material resistance of the concrete slab. Where applied point loads are minimal and

liquid-tightness is not required and the subgrade is uniform and dense, the minimum slab thickness shall be 4 inches with a maximum joint spacing of 10 feet. Joint spacing can be increased if steel reinforcing is added based on subgrade drag theory.

For applications where liquid-tightness is required such as floor slabs of storage tanks, the minimum thickness for uniform foundations shall be five inches and shall contain distributed reinforcing steel. The required area of such reinforcing steel shall be based on subgrade drag theory as discussed in industry guidelines such as American Concrete Institute, ACI 360, "Design of Slabs-on-Grade."

When heavy equipment loads are to be resisted and/or where a non-uniform foundation cannot be avoided, an appropriate design procedure incorporating a subgrade resistance parameter(s) such as ACI 360 shall be used.

Table 3 - Lateral earth pressure values[1/]

		Equivalent fluid pressure (lb/ft2/ft of depth)			
Soil		Above seasonal high water table[2]		Below seasonal high water table[3]	
Description[4/]	Unified Classification[4/]	Free-standing walls	Frame tanks	Free-standing walls	Frame tanks
Clean gravel, sand or sand-gravel mixtures (maximum 5% fines)[5/]	GP, GW, SP, SW	30	50	80	90
Gravel, sand, silt and clay mixtures (less than 50% fines) Coarse sands with silt and and/or clay (less than 50% fines)	All gravel sand dual symbol classifications and GM, GC, SC, SM, SC-SM	35	60	80	100
Low-plasticity silts and clays with some sand and/or gravel (50% or more fines) Fine sands with silt and/or clay (less than 50% fines)	CL, ML, CL-ML SC, SM, SC-SM	45	75	90	105
Low to medium plasticity silts and clays with little sand and/or gravel (50% or more fines)	CL, ML, CL-ML	65	85	95	110
High plasticity silts and clays (liquid limit more than 50)[6/]	CH, MH	-	-	-	-

[1/] For lightly-compacted soils (85 percent to 90 percent maximum standard density.) Includes compaction by use of typical farm equipment.
[2/] Also below seasonal high water table if adequate drainage is provided.
[3/] Includes hydrostatic pressure.
[4/] All definitions and procedures in accordance with ASTM D 2488 and D 653.
[5/] Generally, only washed materials are in this category
[6/] Not recommended. Requires special design if used.

CONSIDERATIONS

Waste storage facilities should be located as close to the source of waste and polluted runoff as practicable.

Non-polluted runoff should be excluded from the structure to the fullest extent possible except where its storage is advantageous to the operation of the agricultural waste management system.

Solid/liquid separation of runoff or wastewater entering pond facilities should be considered to minimize the frequency of accumulated solids removal and to facilitate pumping and application of the stored waste.

Due consideration should be given to environmental concerns, economics, the overall waste management system plan, and safety and health factors.

Considerations for Minimizing the Potential for and Impacts of Sudden Breach of Embankment or Accidental Release from the Required Volume.

Features, safeguards, and/or management measures to minimize the risk of failure or accidental release, or to minimize or mitigate impact of this type of failure should be considered when any of the categories listed in "Potential Impact Categories from Breach of Embankment or Accidental Release" might be significantly affected.

The following should be considered either singly or in combination to minimize the potential of, or the consequences of, sudden breach of embankments when one or more of the potential impact categories listed under "Potential Impact Categories from Breach of Embankment or Accidental Release" may be significantly affected:

An auxiliary (emergency) spillway;

Additional freeboard;

Storage for wet year rather than normal year precipitation;

Reinforced embankment -- such as, additional top width, flattened, and/or armored downstream side slopes;

Protection of exterior embankment slopes which may be exposed to erosive flow conditions when located on or near floodplains.

Secondary Containment.

The following options should be considered to minimize the potential for accidental release from the required volume through gravity outlets when one or more of the potential impact categories listed in the "Potential Impact Categories from Breach of Embankment or Accidental Release" may be significantly affected:

Outlet gate locks or locked gate housing;

Secondary containment;

Alarm system;

Another means to empty the required volume.

Potential Impact Categories from Breach of Embankment or Accidental Release

Surface water bodies -- perennial streams, lakes, wetlands, and estuaries.

Critical habitat for threatened and endangered species.

Riparian areas.

Farmstead, or other areas of habitation.

Off farm property.

Historical and/or archaeological sites or structures that meet the eligibility criteria for listing in the National Register of Historical Places.

Considerations for Minimizing the Potential of Waste Storage Pond Liner Failure

Sites with categories listed under "Potential Impact Categories for Liner Failure" should be avoided if possible. If avoidance is not possible, give consideration to providing an additional measure of safety from seepage.

Should any of the potential impact categories listed in "Potential Impact Categories for Liner Failure" be affected, consideration should be given to the following:

A clay liner designed in accordance with procedures in AWMFH, Chapter 10, Appendix 10D;

A flexible membrane liner over a clay liner;

A geosynthetic clay liner flexible membrane liner;

A concrete liner designed in accordance with slabs on grade criteria for fabricated structures requiring water tightness.

Potential Impact Categories for Liner Failure

Any underlying aquifer is at a shallow depth and not confined.

The vadose zone is rock.

The aquifer is a domestic water supply or ecologically vital water supply.

The site is located in an area of solutionized bedrock such as limestone or gypsum.

Considerations for Improving Air Quality

To reduce emissions of greenhouse gases, ammonia, volatile organic compounds, and odor, other practices such as Anaerobic Digester, Ambient Temperature (365); Anaerobic Digester, Controlled Temperature (366); Waste Facility Cover (367); and Composting Facility (317) can be added to the waste management system.

Adjusting pH below seven may reduce ammonia emissions from the waste storage facility but may increase odor when waste is surface applied (see Waste Utilization, (633)).

Some fabric and organic covers have been shown to be effective in reducing odors.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its purpose.

OPERATION AND MAINTENANCE

An O&M plan shall be developed that is consistent with the purposes of the practice, its design life, safety requirements, and design criteria.

The plan shall contain the operational requirements for emptying the storage facility. This shall include the requirement that waste shall be removed from storage and utilized at locations, times, rates, and volume in accordance with the overall waste management system plan. Include an explanation of permanent markers or recorders installed to indicate maximum operating level.

Include a strategy for removal and disposition of waste with least environmental damage during the normal storage period to the extent necessary to insure the pond's safe operation. This strategy includes removal of the contribution of unusual storm events that may cause the pond to fill to capacity prematurely with subsequent inflow prior to the end of the normal storage period.

Development of an emergency action plan should be considered for waste storage facilities where there is a potential for significant impact from breach or accidental release. Include site-specific provisions for emergency actions that will minimize these impacts.

Where evaporation facilities are included, the O&M plan shall include specific language to explain that pumping (partial emptying) will be necessary to maintain required storage capacity during very wet weather. The O&M plan should also address maintaining the moisture content of the bottom and inner side slopes of the facility during drought to reduce cracking and future seepage losses.

REFERENCES

ASAE. 1991. EP 393.2 - Manure Storages, ASAE. 1992. EP470 - Manure Storage Safety. ASAE. St. Joseph, MI

Midwest Plan Service. 1993. Livestock Waste Facilities Handbook, 3rd Ed. (MWPS-18), Midwest Plan Service. 1994. Concrete Manure Storages Handbook. (MWPS-36), Department of Agricultural and Biosystems Engineering, Iowa State University, Ames, IA.

Agricultural Waste Management Field Handbook. 1992. USDA - NRCS, Washington, D.C.

South Dakota Department of Environment and Natural Resources references.

Animal Waste Management to Protect Water Quality (EC-895), South Dakota Cooperative Extension Service.

Technical Reports 33 and 34, National Oceanic and Atmospheric Administration (NOAA).

APPENDIX 2

Not used at this time.

APPENDIX 3

EPA SARA Title III Extremely Hazards List Is on file at the Brookings County Emergency Management and Zoning Offices

ADDENDUM 1

Right-To-Farm Covenant

Prepared by Brookings County Zoning Office
601 4th Street #105
Brookings, SD 57006

RIGHT TO FARM NOTICE COVENANT

You are hereby notified that the property you are constructing a new residence, stick-built, modular or manufactured, or modifying an existing residence, described in the Legal Description below, that is in or near agricultural land, agricultural operations or agricultural processing facilities or operations. You may be subject to inconvenience or discomfort from lawful agricultural or agricultural processing facility operations. Agricultural operations may include, but are not limited to, the following: the cultivation, harvesting, and storage of crops; livestock production; ground rig or aerial application of pesticides or herbicides; the application of fertilizer, including animal waste; the operation of machinery; the application of irrigation water; and other accepted and customary agricultural activities conducted in accordance with Federal, State, and County laws. Discomforts and inconveniences may include, but are not limited to: noise, odors, fumes, dust, smoke, burning, vibrations, insects, rodents, and/or the operation of machinery (including aircraft) during and 24-hour period. If you live near an agricultural area, you should be prepared to accept such inconveniences or discomforts as a normal and necessary aspect of living in an area with a strong rural character and an active agricultural sector. You are also notified that there is the potential for agricultural or agricultural processing operations to expand. This notification shall extend to all landowners, their heirs and successors or assigns.

Legal Description:_____
_____
_____

IN WITNESS WHEREOF, the Grantors have executed this easement on _____, 20____.

_____ _____
Signature, Grantor Signature, Grantor

STATE OF SOUTH DAKOTA
SS:
COUNTY OF BROOKINGS

This instrument was acknowledged before me on _____, 2006 by

_____ (Grantors).

_____Notary Public

My Commission Expires: _____

ORDINANCE # 2007-03

AN ORDINANCE PROVIDING FOR THE AMENDMENT OF THE 1997 REVISED ZONING ORDINANCE

WHEREAS, BROOKINGS COUNTY has previously adopted the 1997 Revised Zoning Ordinance; and

WHEREAS, the Brookings County, South Dakota, Board of County Commissioners deems it necessary, for the purpose of promoting the health, safety, and the general welfare of the County, to amend the 1997 Revised Zoning Ordinance.

THEREFORE, BE IT ORDAINED BY BROOKINGS COUNTY, SOUTH DAKOTA, that the 1997 Revised Zoning Ordinance of Brookings County be amended as follows:

SECTION A. That Article I, Short Title and Application, be renamed Article 1.00, Short Title and Application.

SECTION B. That Article II, Definitions, be renamed Article 2.00, Definitions.

SECTION C. That Article III, Establishment of Districts, be renamed Article 3.00, Establishment of Districts.

SECTION D. That Article IV, Non-conforming Uses or Lots of Record, be renamed Article 4.00, Non-conforming Uses or Lots of Record.

SECTION E. That Article V, County Zoning Commission, Appeals, Variance and Conditional Uses, be renamed Article 5.00, County Zoning Commission, Appeals, Variance and Conditional Uses.

SECTION F. That Article VI, Duties of County Zoning Officer, Board of County Commissioners, and Courts on Matters of Appeal, be renamed Article 6.00, Duties of County Zoning Officer, Board of County Commissioners, and Courts on Matters of Appeal.

SECTION G. That Article VII, Schedule of Fees, Charges and Expenses, be renamed Article 7.00, Enforcement.

SECTION H. That Article VIII, Enforcement, be renamed Article 8.00, Schedule of Fees, Charges and Expenses.

SECTION I. That Article IX, Amendments, be renamed Article 9.00, Legal Status Provisions.

SECTION J. That Article X, Legal Status Provisions, be renamed Article 10.00, Amendments.

SECTION K. That Article XI, Zoning Districts/Agricultural, be renamed Article 11.00, Agricultural Districts.

SECTION L. That Article XI, Zoning Districts/Commercial/Industrial, be renamed Article 12.00, Commercial/Industrial Districts.

SECTION M. That Article XI, Zoning Districts/Lake Park, be renamed Article 13.00, Lake Park Districts.

SECTION N. That Article XI, Zoning Districts/Natural Resource, be renamed Article 14.00, Natural Resource Districts.

SECTION O. That Article XI, Zoning Districts/Flood Damage Prevention, be renamed Article 15.00, Flood Damage Prevention.

SECTION P. That Article XI, Zoning Districts/Aquifer Protection, be renamed Article 16.00, Aquifer Protection.

SECTION Q. That Article XII, General Requirements/Screening, Vision Clearance on Corner Lots, Refuse, Unlicensed Vehicles, Moved in Buildings and Minimum Water and Sewer Requirements, be renamed Article 17.00, General Requirements.

SECTION R. That Article XII, General Requirements/ Minimum Mobile/Manufactured Home Requirements, be renamed Article 18.00, Minimum Mobile/Manufactured Home Requirements.

SECTION S. That Article XII, General Requirements/ Shelterbelt Setback Requirements, be renamed Article 19.00, Shelterbelt Setback Requirements.

SECTION T. That Article XII, General Requirements/Home Occupations, be renamed Article 20.00, Home Occupations.

SECTION U. That Article XII, General Requirements/Extended Home Occupations, be renamed Article 21.00, Extended Home Occupations.

SECTION V. That Article XII, General Requirements/Concentrated Animal Feeding Operation, be renamed Section 22.00, Concentrated Animal Feeding Operation.

SECTION W. That Article XII, General Requirements/Wind Energy System (WES) Requirements, be renamed Article 23.00, Wind Energy System (WES) Requirements.

SECTION X. In all respects the 1997 Revised Zoning Ordinance shall remain unchanged and is hereby re-ordained.

FIRST READING: November 20, 2007

SECOND READING: November 27, 2007

Chairperson, Brookings County
Board of County Commissioners

ATTEST:

Brookings County Auditor

ORDINANCE # 2015-03

AN ORDINANCE RE-ADOPTING THE 1997 REVISED ZONING ORDINANCE AND ALL AMENDMENTS THERETO THEREBY ESTABLISHING ZONING REGULATIONS FOR BROOKINGS COUNTY, SOUTH DAKOTA, AND PROVIDING FOR THE ADMINISTRATION, ENFORCEMENT, AND AMENDMENT THEREOF, IN ACCORDANCE WITH THE PROVISIONS OF CHAPTERS 11-2, 1967 SDCL, AND AMENDMENTS THEREOF, AND FOR THE REPEAL OF ALL RESOLUTIONS AND ORDINANCES IN CONFLICT THEREWITH

WHEREAS, BROOKINGS COUNTY adopted 1997 Revised Zoning Ordinance in accordance with Chapter 11-2, 1967 SDCL, and amendments thereof; and

WHEREAS, BROOKINGS COUNTY adopted amendments to 1997 Revised Zoning Ordinance in the same manner the 1997 Revised Zoning Ordinance was adopted in accordance with SDCL 11-2-28; and

WHEREAS, SDCL 11-2-20 requires the adoption of zoning regulations to be by Ordinance; and

WHEREAS, the Brookings County, South Dakota, Board of County Commissioners deems it necessary, for the purpose of promoting the health, safety, and the general welfare of the County, to re-adopt the 1997 Revised Zoning Ordinance as amended.

THEREFORE, BE IT ORDAINED BY BROOKINGS COUNTY, SOUTH DAKOTA, that the 1997 Revised Zoning Ordinance of Brookings County, as amended, be adopted as follows:

SECTION A. Article 1.00, Short Title and Application.

SECTION B. Article 2.00, Definitions.

SECTION C. Article 3.00, Establishment of Districts.

SECTION D. Article 4.00, Non-conforming Uses or Lots of Record.

SECTION E. Article 5.00, County Zoning Commission, Appeals, Variance and Conditional Uses.

SECTION F. Article 6.00, Duties of County Zoning Officer, Board of County Commissioners, and Courts on Matters of Appeal.

SECTION G. Article 7.00, Enforcement.

SECTION H. Article 8.00, Schedule of Fees, Charges and Expenses.

SECTION I. Article 9.00, Legal Status Provisions.

SECTION J. Article 10.00, Amendments.

SECTION K. Article 11.00, Agricultural Districts.

SECTION L. Article 12.00, Commercial/Industrial Districts.

SECTION M. Article 13.00, Lake Park Districts.

SECTION N. Article 14.00, Natural Resource Districts.

SECTION O. Article 15.00, Flood Damage Prevention.

SECTION P. Article 16.00, Aquifer Protection.

SECTION Q. Article 17.00, General Requirements.

SECTION R. Article 18.00, Minimum Mobile/Manufactured Home Requirements.

SECTION S. Article 19.00, Shelterbelt Setback Requirements.

SECTION T. Article 20.00, Home Occupations.

SECTION U. Article 21.00, Extended Home Occupations.

SECTION V. Article 22.00, Concentrated Animal Feeding Operation.

SECTION W. Article 23.00, Wind Energy System (WES) Requirements.

SECTION X. Article 24.00, Transmission Pipeline Risk Reduction Overlay District.

SECTION Y. In all respects the 1997 Revised Zoning Ordinance shall remain unchanged and is hereby re-ordained.

First Reading:	Tuesday, December 15, 2015
Second Reading:	Tuesday, December 29, 2015
Publication:	Thursday, January 7, 2016 & Thursday, January 14, 2016
Effective Date:	Thursday, February 4, 2016

Chairman, Brookings County Board of
County Commissioners

ATTEST:

County Finance Officer

BROOKINGS COUNTY ORDINANCE NO. 2018-02

AN ORDINANCE PROVIDING FOR THE AMENDMENT OF ORDINANCE 2015-03

WHEREAS, BROOKINGS COUNTY previously adopted Ordinance 2015-03, which re-adopted the 1997 Revised Zoning Ordinance in accordance with Chapter 11-2;

WHEREAS, the Brookings County, South Dakota, Board of County Commissioners deems it necessary, for the purpose of promoting the health, safety, and the general welfare of the County, to amend Ordinance 2015-03 by repealing the following Articles: Article 5.00 - County Zoning Commission, Appeals, Variance and Conditional Uses.; Article 6.00 – Duties of County Zoning Officer, Board of County Commissioners and Courts on Matters of Appeal.; Article 7.00 – Enforcement.; Article 8.00 – Schedule of Fees, Charges and Expenses.; Article 10.00 – Amendments.; and replacing said Articles with Article VI, a copy of which is attached hereto, Administration-Chapter 6:01. General.; Chapter 6.02. Zoning Official.; Chapter 6.03. Planning and Zoning Commission.; Chapter 6.04. Board of Adjustment.; Chapter 6.05. Procedures for Conditional Uses, Variances, and Zoning Amendments., and Chapter 6.06. Repeal of Conflicting Ordinances.

THEREFORE, BE IT ORDAINED BY BROOKINGS COUNTY, SOUTH DAKOTA, that Ordinance 2015-03 is hereby amended by repealing the following Articles: Article 5.00 - County Zoning Commission, Appeals, Variance and Conditional Uses.; Article 6.00 – Duties of County Zoning Officer, Board of County Commissioners and Courts on Matters of Appeal.; Article 7.00 – Enforcement.; Article 8.00 – Schedule of Fees, Charges and Expenses.; Article 10.00 – Amendments.; and replacing said Articles with Article VI, a copy which is attached hereto, Administration-Chapter 6:01. General.; Chapter 6.02. Zoning Official.; Chapter 6.03. Planning and Zoning Commission.; Chapter 6.04. Board of Adjustment.; Chapter 6.05. Procedures for Conditional Uses, Variances, and Zoning Amendments., and Chapter 6.06. Repeal of Conflicting Ordinances.

Adopted this 13th day of March, 2018.

BROOKINGS COUNTY:

Lee Ann Pierce,
Chairperson, Brookings County
Board of County Commissioners

SEAL OF COUNTY FINANCE OFFICE BROOKINGS COUNTY SOUTH DAKOTA

ATTEST:

Kristen Witkop Dep.

Vickie Buseth
Brookings County Finance Officer

First Reading: February 20, 2018

Second Reading: March 13, 2018

Adopted: March 13, 2017

Publications: March 22, 2018 and March 29, 2018

Effective Date: April 19 2018

BROOKINGS COUNTY ORDINANCE NO. 2018-03

AN ORDINANCE PROVIDING FOR THE AMENDMENT OF ORDINANCE 2015-03

WHEREAS, BROOKINGS COUNTY previously adopted Ordinance 2015-03, which re-adopted the 1997 Revised Zoning Ordinance in accordance with Chapter 11-2;

WHEREAS, the Brookings County, South Dakota, Board of County Commissioners deems it necessary, for the purpose of promoting the health, safety, and the general welfare of the County, to amend Ordinance 2015-03 by repealing the following Articles: Article 12.00 – Commercial/Industrial Districts.; Article 13.00 – Lake/Park Districts. ; Article 14 – Natural Resources Districts.; Article 15.00 – Flood Damage Prevention.; Article 16.00 – Aquifer Protection.; and replacing said Articles with Article IV, a copy of which is attached hereto, District Requirements-Chapter 4.02. "CI" – Commercial / Industrial Districts.; Chapter 4.03. – "LP" – Lake Park Districts.; Chapter 4.04. – Natural Resource Districts.; Chapter 4.05. – Flood Damage Prevention.; Chapter 4.06. – Aquifer Protection.; and the repealing of conflicting ordinances.

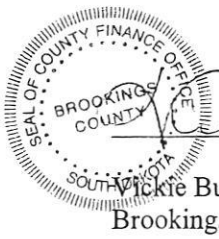
THEREFORE, BE IT ORDAINED BY BROOKINGS COUNTY, SOUTH DAKOTA, that Ordinance 2015-03 is hereby amended repealing the following Articles: Article 12.00 – Commercial/Industrial Districts.; Article 13.00 – Lake/Park District.; Article 14 – Natural Resources Districts.; Article 15.00 – Flood Damage Prevention.; Article 16.00 – Aquifer Protection.; and replacing said Articles with Article IV, a copy of which is attached hereto, District Requirements-Chapter 4.02. "CI" - Commercial / Industrial Districts.; Chapter 4.03. - "LP" - Lake Park Districts.; Chapter 4.04. - Natural Resource Districts.; Chapter 4.05. - Flood Damage Prevention.; Chapter 4.06. - Aquifer Protection.; and the repealing of conflicting ordinances.

Adopted this 15th day of May, 2018.

BROOKINGS COUNTY:

Lee Ann Pierce,
Chairperson, Brookings County
Board of County Commissioners

ATTEST:



Vickie Buseth
Brookings County Finance Officer

First Reading: April 17, 2018

Second Reading: May15, 2018

Adopted: May 15, 2017

Publication: May 24, 2018

Publication: May 31, 2018

Effective Date: June 21, 2018