5. Livestock Waste Management Provisions

Introduction

A livestock waste management system is a planned system to manage liquid and solid wastes from a confined animal feeding operation (CAFO). It includes runoff from non-concentrated waste areas, with ultimate disposal in a manner that prevents or minimizes degradation of air, soil and water resources and protects public health and safety. Such systems are planned to preclude discharge of pollutants to surface or ground water and, to the fullest practicable extent, utilize waste products through soil and plants. Through proper collection, storage, transportation, and utilization of wastes, pollution may be greatly reduced or eliminated.

For further information on livestock waste system design, regulation and management of animal wastes, refer to:

NPS Livestock Waste Management Handbook, Division of Conservation, Kansas Department of Agriculture, 1995.

Agricultural Waste Management Field Handbook, USDA Natural Resources Conservation Service, 1992.

Livestock Waste System Definitions

1. **Confined Animal Feeding Operation:** A lot, yard, corral, building, or other area without permanent vegetation where animals are confined greater than 45 days within a 12 month period.

2. **Existing Confined Animal Feeding Operation:** A confined animal feeding operation over one year old currently in operation, or a confined animal feeding operation having been in production within the last five (5) years.

3. **New Confined Animal Feeding Operation:** A confined animal feeding operation that has been in operation less than one year or has not begun feeding at the proposed site.

4. **Animals or Livestock:** Cattle, swine, horses, sheep or lambs, laying hens or broilers, turkeys, and ducks.

Livestock Waste System Eligibility

1. An existing confined animal feeding operation with less than 1,000 animal units that has been determined by the Kansas Department of Health and Environment (KDHE) to have a significant pollution potential and is required to obtain a permit and install the appropriate pollution control practice(s).

2. An existing confined animal feeding operation with less than 300 animal units that has been determined by KDHE to have a significant pollution potential and is required to install pollution control practices to bring the facility into compliance for a certification.

3. The relocation of an existing confined animal feeding operation with less than 1,000 animal units that is required by KDHE to relocate to either obtain a permit or receive a certification.

4. Confined animal feeding operations are not eligible for cost-share assistance in the following circumstances:

   a. Facilities over 999 animal units. An exception may be granted by DOC. Request for an exception will be reviewed by the DOC on a case by case basis. (See the Livestock Waste System Cost-Share Eligibility Worksheet for Facilities over 999 Animal-Units found under Forms and Examples at the end of the chapter.)

   b. New confined animal feeding operations.

   c. Livestock Waste Systems that do not replace or modify an existing livestock waste control facility or confined animal feeding operation.

   d. Confined animal feeding operators who incur court action for non-compliance with KDHE confined animal feeding operation regulations.

General Policies

1. The DOC recommends the engineering design assistance cost-share be placed in one contract and the Livestock Waste System practices be placed in a second contract. It is also recommended the contract for the Livestock Waste System practices not be submitted for DOC approval until the system design is complete. This will provide the correct practices/components and units with current County Average Cost.

2. All Livestock Waste Management Systems must be designed and constructed to meet NRCS standards and specifications. Exception may be granted by DOC on a case-by-case basis.

3. All livestock waste control and management system plans shall be submitted to KDHE for review and approval before construction begins.

4. All eligible DOC practices for Livestock Waste Systems (LWS) will be offered locally including design fee reimbursement and practices required for relocation. Districts shall establish County Average Cost for practices.

5. Standard 70% Cost-Share Rate is required for all livestock waste systems.

6. Districts will set the local Landowner Limit and Project Limit up to $10,000.

7. All projects exceeding annual district Landowner Limit will be funded as a multi-year contract and/or submitted to DOC for supplemental funding consideration.

8. Livestock Waste Systems have a DOC Project Limit of $20,000 for cost-share assistance and $10,000 for engineering design assistance for a total project limit of $30,000.

9. Expansion costs of a livestock waste system requiring a design that accommodates more animal units than currently exists is not eligible for financial assistance. Exception may be granted by the DOC.

10. Sewage discharge from a home site is not authorized to be deposited in a livestock waste facility of any type.

11. All livestock waste system designs must be certified by a Kansas registered professional engineer as properly constructed, complete, and approved by KDHE. Exceptions may be granted by the DOC for K-State Research and Extension designs approved by KDHE for demonstration purposes.

12. Livestock Waste Systems designed for previously unpermitted facilities: minimum pollution control measures are to be determined by the design engineer as needed to comply with KDHE pollution control requirements, which follow applicable NRCS standards for design, construction, and operation.

13. Permitted facilities: Cost-share will be available only for pollution control practices necessary to comply with new or modified KDHE requirements, and that are not a result of changes in the operation of the facility.

14. Partial payments are not authorized for livestock waste control systems except for grass seeding, trees for feedlot windbreaks, and engineering design reimbursement. Exception may be granted by DOC.

15. Only NRCS, conservation district or KDHE representatives, or private or public engineers shall conduct permeability tests for waste storage structures. The KDHE Standpipe Test is allowable if KDHE approves of this test for a particular site, however, a more thorough lab or compaction test is recommended.

16. The KDHE guidelines for calculating animal units shall be used to determine size eligibility for cost-share assistance for livestock waste systems. Determining total animal units for a producer with multiple sites shall be based on KDHE's permitting (aggregate total of many sites may exceed 1,000 animal units; however the producer may be eligible if KDHE has recognized and permitted each site separately).

Livestock Waste System Cost-Share Account

1. The DOC maintains a central Livestock Waste System (LWS) Cost-Share Account for districts to request funding for Livestock Waste Management System implementation. This is applicable only to NPSPCP.

2. All LWS practices for either permitted or certified facilities, along with practices for relocation, are eligible for funding from the LWS Cost-Share Account. The following practices under the NPS Riparian Area Protection Project Type are also eligible for funding from this account.

    a. Concentrated Non-Confined Livestock (see Code 390)

    b. Fencing (see Code No. 382)

    c. Pipeline (see Code No. 516)

d. Pond (see Code No. 378)

e. Pumping Plant for Water Supply (see Code No. 533)

f. Spring Development (see Code No. 574)

g. Watering Facility (see Code No 614)

h. Water Well (see Code No. 642)

i. Windbreak/Shelterbelt Establishment (see Code No. 380)

j. Windbreak/Shelterbelt Renovation (see Code 650)

3. Districts must request funding from the LWS Cost-Share Account when the LWS project cost exceeds the district project limit.

4. Design fee reimbursement is eligible for funding from the LWS Cost-Share Account.

5. The current program year application form for LWS Cost-Share Account funds will be sent to districts in June of each year. An example application form can be found under Forms and Examples at the end of the chapter.

6. Applications for LWS Cost-Share Account funds will be ranked and funded quarterly by the DOC.

7. Districts will be notified by DOC when an application for LWS Cost-Share Account funds is approved. Funds will be allocated under the AFO Fund Source Code.

Design and Certification Policy

1. All livestock waste systems receiving cost-share from the DOC must be designed by a Kansas licensed professional engineer except as noted in number 6 on the next page**.**

2. Professional liability insurance will be required for all licensed engineers who design state cost-share systems. Documentation of liability insurance should be kept in the district contract file.

3. The certification requirements for pollution control practices requiring an engineer to design the structural components of a pollution control system are:

   a. A Qualified Representative is required to oversee project implementation and is responsible for certifying the components, unit, and/or quantities listed on the CS-4, Certification of Completion/Request for Payment. Qualified Representatives include:

      i. NRCS.

      ii. A licensed professional engineer.

4. Practice design certification will consist of:

    a. Verification that all necessary permits are approved and any contingent requirements have been met.

    b. Verification that practices were installed according to minimum design specifications.

    c. Calculation of units and quantities of installed pollution control practices in accordance with DOC cost-share guidelines and policies.

5. If no qualified representative can be obtained to perform practice certification, the DOC shall be advised.

6. **Exceptions to the DOC policy of requiring Kansas licensed professional engineers to design state cost-share systems may be granted for:**

    a. Demonstration projects designed and overseen by KSU Extension - Ag Engineering.

    b. Non-licensed consultant or producers providing a design that KDHE has approved. KDHE approval in this scenario would be contingent on the consultant or producer securing liability insurance (errors and omissions).

Relocation of an Existing Confined Animal Feeding Operation

1. Relocation of a confined animal feeding operation shall be based on the design engineer's or KDHE's determination that the existing site does not have feasible pollution control capability.

2. Cost-share funding shall be based on the current number of animal units at the existing facility. Expansion costs above the current animal units are the responsibility of the landowner. Ask the design engineer to provide the units of each practice that would be needed for the current animal unit numbers at the new site.

3. Practices eligible for cost-share include only **minimum** pollution control measures, as determined by the design engineer, and are components of the livestock waste system.

4. Following are the reclamation policies for a relocated confined animal feeding operation. These policies are part of the practice maintenance agreement signed by the landowner and are required to be completed within one year of the livestock waste system completion date:

    a. Clean and properly dispose of waste from the existing facility.

    b. Remove interior fencing and feeding facilities to disable confined feeding of animals.

    c. Plant vegetation at the site as recommended by the conservation district to maximize nutrient uptake.

d. If grazing occurs at the reclaimed site, stocking rates shall not exceed district guidelines for pasture or rangeland within the county.

5. The following additional practices are eligible for the relocation of an existing livestock facility:

   a. Access Road (see Code No. 560)

   b. Fencing (see Code No. 382) - Pipe and/or cable perimeter fencing allowed when a LWS is relocated and the abandoned site had cable and/or pipe perimeter fencing. Fencing is applicable only if plan design requires it. Interior fencing is not eligible. Only the amount of exterior fencing at the old livestock facility is eligible for cost-share assistance at the new relocated facility.

   c. Pipeline (see Code No. 516)

   d. Pond (see Code No. 378)

   e. Pumping Plant for Water Supply (see Code No. 533)

   f. Spring Development (see Code No. 574)

   g. Heavy Use Area Protection (see Code No. 561) - Concrete bunk pads for a relocated animal feeding operation where the abandoned site had concrete bunk pads. Only the amount of linear feet of concrete bunk pads at the old livestock facility is eligible for cost-share assistance at the new relocated facility.

   h. Stream Crossing (see Code No. 578)

   i. Watering Facility (see Code No 614)

   j. Water Well (see Code No. 642)

   k. Windbreak/Shelterbelt Establishment (see Code No. 380)

   l. Windbreak/Shelterbelt Renovation (see Code 650)

Engineering Design Assistance Options

OPTION 1: Natural Resources Conservation Service (NRCS) - A landowner may select the NRCS for engineering design assistance at no charge. In some areas, NRCS may not be able to provide design assistance.

OPTION 2: Private Engineering Firm - A landowner may choose a private firm for design and be reimbursed by the DOC. Private engineering design fees will be set at 100% up to a maximum of $10,000.

a. The engineering design reimbursement is not cost-share, however the design cost up to $10,000 can be paid from the conservation districts annual NPS allocation or from the DOC central Livestock Waste account. Design fee reimbursement will be limited to existing facilities (includes required relocations).

b. If the landowner does not install the designed animal waste system, he/she is **NOT** eligible for design reimbursement.

c. Partial payment for engineering design reimbursement is allowable. KDHE must first approve the design. Upon approval, (copy of the letter sent to landowner) the conservation district must have documentation before requesting payment from the DOC.

d. Conservation districts are encouraged to send a letter to the landowner who is using a private engineer for their livestock waste system design outlining the landowners and design engineers responsibilities. See an example letter found under Forms and Examples at the end of the chapter.

Livestock Waste System Practices

A livestock waste system may consist of a single practice such as a waste storage pond or a combination of several practices. The following practices are authorized for cost-sharing:

1. Access Road (see Code No. 560) – An earthen roadway constructed to facilitate access to a relocated livestock holding or feeding area.

2. Animal Mortality Facility (see Code No. 316) – An on-farm facility for the treatment or disposal of livestock and poultry carcasses.

3. Closure of Waste Impoundments (see Code No. 360) – The closure of waste impoundments (treatment lagoons and liquid storage facilities) that are no longer used for their intended purpose in an environmentally safe manner.

4. Composting Facility (see Code No. 317) – A facility to process raw manure or other raw organic by-products into a biologically stable organic material.

5. Constructed Wetland (see Code No. 656) – A wetland constructed for water quality improvement.
6. Contour Buffer Strips (see Code No. 332) – Strips of perennial vegetation alternated with wider cultivated strips that are farmed on the contour.

7. Critical Area Planting (see Code No. 342) – Planting grasses on erodible areas as part of a livestock waste system to stabilize the soil reducing erosion damage.

8. Dike (see Code No. 356) – To assist in the protection of feeding areas by regulating water and making better use of drainage.

9. Diversion (see Code No. 362) – A channel and supporting ridge constructed to divert excess water or pollutants during runoff events.

10. Fencing (see Code No. 382) – Pipe and/or cable perimeter fencing is allowed when a LWS is relocated and the abandoned site had cable and/or pipe perimeter fencing. Fencing is applicable only if plan design requires it. Interior fencing is not eligible.

11. Field Border (see Code No. 386) – Establishing a border or strip of perennial vegetation along or around the edge of a field by planting herbaceous vegetation.

12. Filter Strip (see Code No. 393) – A strip or area of vegetation for removing sediment, organic matter, and other pollutants from runoff and wastewater.

13. Grade Stabilization Structure (see Code No. 410) – To stabilize the grade and to control erosion in artificial channels.

14. Grassed Waterway or Outlet (see Code No. 412) – A natural or constructed waterway or outlet with established vegetation to remove sediment, organic matter, and other pollutants from runoff and wastewater.

15. Heavy Use Area Protection (see Code No. 561) – The stabilization of animal feeding areas frequently and intensively used by animals, by surfacing with suitable materials, and/or installing needed structures. Only applies to concrete bunk pads for a relocated animal feeding operation where the abandoned site had concrete bunk pads.

16. Irrigation System, Trickle (see Code No. 441) – To efficiently apply water directly to the tree/shrub root zone to maintain soil moisture within the range of good plant growth.

17. Land Smoothing (see Code No. 466) – Improve surface drainage in livestock waste systems.

18. Lined Waterway or Outlet (see Code No. 468) – A waterway or outlet having an erosion-resistant lining of concrete, stone, synthetic turf reinforcement fabrics, or other permanent material.

19. Manure Transfer (see Code 634) – A manure conveyance system using structures or conduits.

20. Monitoring Well (see Code No. 353) – A well constructed to monitor groundwater quality as required by the KDHE permit for a confined animal feeding operation.

21. Mulching (see Code No. 484) – Applying fabric weed barrier to the soil surface when establishing a feedlot windbreak.

22. Nutrient Management (see Code No. 590) – Managing the amount, placement, and timing of animal waste.

23. Pipeline (see Code No. 516) – Installed for conveying water for livestock to a relocated livestock holding or feeding area.

24. Pond (see Code No. 378) – A water impoundment made by constructing a dam, embankment, or by excavating a pit or dugout to supply water to a relocated livestock holding or feeding area.

25. Pond Sealing or Lining (see Code No. 521A, 521B, 521C) – Installing a fixed lining of impervious material or treating the soil in a pond mechanically or chemically to impede or prevent excessive water loss.

26. Precision Land Forming (see Code No. 462) – Used only in livestock waste systems to improve surface drainage.

27. Pumping Plant for Water Supply (see Code No. 533) – A pumping facility installed to transfer water as part of an alternative water supply for livestock to a relocated livestock holding or feeding area.

28. Roof Runoff Structure (see Code No. 558) – Structures that collect, control and transport precipitation from roofs to areas outside the livestock waste system containment area.

29. Sediment Basin (see Code No. 350) – An earth embankment to trap and collect sediment and animal waste.

30. Spring Development (see Code No. 574) – Improving springs and seeps by excavating, cleaning and providing collection and storage facilities to provide water to a relocated livestock holding or feeding area.

31. Stream Crossing (see Code No. 578) – A constructed travel way through a streambed comprised of rock and geotextile.

32. Structure for Water Control (see Code No. 587) – A structure in a livestock waste system that conveys water, controls the direction or rate of flow, and maintains a desired water surface elevation.

33. Subsurface Drain (see Code No. 606) – To regulate surface runoff or groundwater and alleviating drainage problems.

34. Terrace (see Code 600) – an earth embankment, a channel or a combination ridge and channel constructed across the slope.

35. Underground Outlet (see Code No. 620) – A subsurface conduit installed to dispose of liquid animal waste and contaminated runoff from sediment control basins, diversions, terraces, etc.

36. Vegetated Treatment Area (see Code No. 635) – A designed area or strip of herbaceous vegetation for removing sediment, organic matter, and other pollutants from runoff and wastewater.

37. Waste Storage Facility (see Code No. 313) – A facility constructed for the temporary storage of animal waste. The purpose of the practice is to store waste until it can be safely and effectively used.

38. Waste Treatment Lagoon (see Code No. 359) – An impoundment made by excavation or earthfill for biological treatment of animal wastes.

39. Watering Facility (see Code No 614) – A trough, tank, or waterer installed to provide drinking water for livestock at a relocated livestock holding or feeding area.

40. Water Well (see Code No. 642) – A well constructed or improved to provide water for livestock at a relocated livestock holding or feeding area.

41. Windbreak/Shelterbelt Establishment (see Code No. 380) – A strip or belt of trees established next to a relocated animal feeding operation to provide shelter for livestock.

42. Windbreak/Shelterbelt Renovation (see Code 650) – Replacing selected trees and shrubs rows within an existing windbreak or shelterbelt used for livestock. This also includes adding rows to the windbreak or shelterbelt.

KDHE Permit Applications

Applications for KDHE new permits, permit renewals and registrations can be found on the KDHE website at the following address: www.kdhe.state.ks.us/feedlots/

KDHE Significant Pollution Potential Form

The KDHE Livestock Waste Management Program Determination of Significant Pollution Potential Worksheet can be found under Forms and Examples at the end of the chapter. This form is used by KDHE district staff to determine if a livestock facility has a significant pollution potential and is required to be permitted or certified. This worksheet can be used by conservation district staff to help a livestock producer determine if their livestock facility may need to be permitted or can be certified. Livestock producers need to be aware that KDHE staff will have to fill out the worksheet before they are eligible for cost-share assistance. The score from the worksheet that has been completed by KDHE staff is entered in the Project Information in CSIMS when completing a Livestock Waste Management contract.

Livestock Waste System Cost-Share Eligibility Worksheet
Facilities over 999 Animal Units

If the answer to statement No. 1 or No. 2 is "True" the livestock facility is eligible for cost-share assistance from either the conservation districts allocation or the DOC Supplemental Livestock Waste System Account.	**Check if "True"**
1. The livestock facility is currently under 1000 animal units, but will be permitted over 999 animal units.	
2. The livestock facility will be permitted over 999 animal units due to multiple species at the location and the site being added to the permit is less than 1000 animal units.	
If the answer to statement No. 3 or No. 4 is "True" the livestock facility is only eligible for cost-share assistance from the DOC Supplemental Livestock Waste System Account. If the answer to statement No. 3 and No. 4 is "False" the livestock facility is not eligible for cost-share assistance.	
3. The livestock facility is currently over 999 animal units and is within a two mile radius (or other designated source water protection zone) of a public water supply well.*****	
4. The livestock facility is currently over 999 animal units and is within a High Priority TMDL area impaired by Fecal Coliform Bacteria, Dissolved Oxygen, Nutrients or Eutrophication.*****	
Complete the following information if any of the above statements are "True": **Landowner Name:_____** **Address: _____** **Legal Description: _____** **HUC Code: _____** **KDHE Permit Number, if already permitted: _____** **DOC Contract Number: _____**	
NOTE: A completed worksheet must be placed in contract file.	

***** Supplemental applications for eligible livestock facilities over 999 animal units will not be consider for supplemental funding until after the April 1st cancellation of uncommitted funds and all eligible applications for livestock facilities under 1,000 animal units have been funded.

Example Letter to Landowner

Happy County Conservation District
400 Water Street
Anytown, KS 00000

May 1, 2006

Landowner Name
Address

Dear Mr. Landowner:

You have requested cost sharing from the Division of Conservation, Kansas Department of Agriculture for the Livestock Waste System practices indicated on the attached approved contract. You have indicated that your system will be designed by a Kansas registered professional engineer. The Happy County Conservation District welcomes the involvement of your engineer. However, you need to be aware that the Division of Conservation, Kansas Department of Agriculture requires that the engineer must be responsible for designing your Livestock Waste System to meet Natural Resources Conservation Service (NRCS) standards and specifications and for certifying the work. Also, the engineer must provide to the conservation district documentation that the engineer has professional liability insurance.

When contracting with an engineering firm, get bids for the total cost of the design, survey, layout and checkout of your livestock waste system.

There are certain items that must be submitted to the conservation district to meet the above requirements. These items are outlined in this letter. We hope this will provide a clear understanding for all parties involved and prevent any possible misunderstanding. The following items are needed.

Prior to Construction

1. A waste utilization plan must be prepared and be included with the design.

2. You need to submit the following items prepared by the engineer to the conservation district.

    a. A copy of the signed engineering plans which meet NRCS standards. In addition to the Professional Engineer's certification, the plans shall contain the following statement: **"To the best of my professional knowledge, judgment and belief, these plans meet applicable NRCS standards and specifications."**

    b. A copy of the design engineer's cost estimate.

    c. A copy of an inspection plan which describes inspection items and qualifications of those doing the inspection.

3.You are responsible for obtaining all permits (KDHE Livestock Waste Management Permit, County Zoning, etc.) and contacting all utility companies with facilities in the work area.

During Construction

1.You are responsible for hiring the contractor, ensuring the inspection plan is carried out and the structure is completed according to the approved plan and specifications.

2.Changes during construction will need to be approved by the design engineer and noted on "as-built" drawings.

After Construction

1.Upon completion, you must submit to the conservation district a copy of the "as-built" drawing, a certification statement signed by your engineer, and a copy of any construction documentation required in the inspection plan. The certification statement should read **"to the best of my professional knowledge, judgment and belief, the installed practices meets NRCS standards"** and signed by the engineer who designed the system.

2.The conservation district will make a field visit to the site to verify completion based on the engineers certification statement.

3.You will need to follow the Operation and Maintenance Plan for the system.

I hope this letter fully explains the conservation districts expectations. If you have any questions, please call me at (phone number).

Sincerely,

Conservation District Staff

cc: Design Engineer

Livestock Waste Management Program Determination of Significant Pollution Potential (Instructions and Definitions)

Section A — Section A lists the conditions which are listed in statutes and regulations as requiring a permit. These are conditions of significant pollution potential.

Section B

1. Using the state definition of animal units, determine proposed/ existing maximum capacity of the facility. Use the table to determine a risk factor.
2. Determine the slope of the pen area along the longest runoff flow path. The slope is the change in elevation divided by flow length (rise/run) in the same units of measure. It is common practice to express the slope in percent, so multiply the rise/run by 100 to get the percent slope. The use of topographic maps or hand level and pacing can help in making this determination. Use the table to determine a risk factor.
3. Determine the slope from the pen area to the nearest protected water body along the runoff flow path. Use the methods and aides described in # 2 above. The change in elevation is measured from the top of the stream or channel bank to the bottom elevation of the pens. A protected water body is a stream shown on a USGS topographic map, any water body listed in the Kansas Water Quality Standards, and all wetlands. Use the table to determine a risk factor.
4. Determine the distance to the nearest protected water body. This is the same distance used in #3 as the flow length (run). Use the table to determine a risk factor.
5. Interview the operator to determine the length of time the facility will be used each year. Use the table to determine a risk factor.
6. Use the county Soil Survey to determine the predominant soil type along the flow path used in # 3 and 4.Use the table to determine a risk factor.
7. Observe the buffer area. The buffer area is that area below the pens where runoff from the pens remains dispersed, solids in the runoff can be collected, and depth of flow does not exceed three inches. Use the table to determine a risk factor.
8. Compare the size of the buffer to the existing or proposed pen area. Use the table to determine a risk factor.
9. Extraneous drainage is that area above the confinement area which will allow runoff to flow through the pens and will not or cannot be diverted around the confinement area. Compare the extraneous drainage area to the pen area. Use the table to determine a risk factor.
10. Use reference material to determine annual rainfall for the county the facility is located in. Use the table to determine a risk factor.

11. Use reference material to determine rainfall intensity. For the purposes of this form, use the 25-year25-hour rainfall event. Use the table to determine a risk factor.

Section C

1. Use the same answer as given in question 1.
2. Use the same answer as given in question 10.
3. Use best available information to determine depth to groundwater. Possible sources of information: measuring a nearby well, KDHE well log data base, KGS Survey or studies, interview a well driller who is familiar with the area, etc. Use the table to determine a risk factor.
4. Use the county Soil Survey to determine type of soil in the area. It should be the same soil type as in question #6. Use the table to determine a risk factor.
5. Measure the distance using maps or wheel for wells other than those wells used by the facility. Use the table to determine a risk factor.

Section D

1. Observe the existing/proposed pens and runoff flow path for springs, rock outcrops and other features which if contaminated by runoff could cause an environmental problem. If a potential problem is observed enter "yes".
2. Consult KCC map on Sensitive Groundwater areas.
3. Consult the KDHE Outstanding Natural Resource Waters and Special Aquatic Life Use Surface Waters map from the Water Quality Standards.

Section E

Section E is self explanatory.

Livestock Waste Management Program Determination of Significant Pollution Potential (Worksheet)

Name: _____ Date: _____

Address: _____ Permit #_____

City/State/Zip: _____ Site # _____

Location: _____1/4, Section_____, T- ____- S, R- _____- E/W, _____ County

Inspector:_____
Print Name **Title**

Section A **Permit Required**

1.	Over 1,000 AUs, meets NPDES definition, or 300 AUs and discharges through a manmade device	Yes	No
2.	Has a lagoon(s), pit(s), or tank(s) for waste storage	Yes	No
3.	Has a perennial, intermittent or ephemeral stream through or adjacent to pens	Yes	No
4.	Uses improper waste collection, handling, or disposal	Yes	No
5.	Has daily discharge	Yes	No

Section B **Surface Water Protection**

1. Capacity (AUs) — Risk Factor — Risk = ____

<50	1
50 - 100	3
100 - 300	5
300 - 500	7
500 - 700	8
700 - <1000	9

Comments:

2. Pen Slope — Risk = ____

< 1%	1
1 - 2 %	3
2 - 3%	5
3 - 4%	7
4 - 5%	9
>5%	10

Comments:

3. Slope from pen to protected water body

< 1%	1		Risk = ____
1 - 2 %	3	Comments:	
2 - 3%	5		
3 - 4%	7		
4 - 5%	9		
>5	10		

4. Distance from pens to protected water body

>5280 feet	1		Risk = ____
4000 - 5280	2	Comments:	
2640 - 4000	4		
1000 - 2640	5		
500 - 1000	7		
100 - 500	9		
<100	10		

5. Utilization

< 3 months/year	1		Risk = ____
3 - 4	4	Comments:	
5-6	6		
>7	9		

6. Soils between pens and protected water body

Clay	9		Risk = ____
Silty Clay	7	Comments:	
Silt	5		
Silty Sand	3		
Sand	1		

7. Buffer (Def.: overland sheet flow area)

Dense cover of grass	1		Risk = ____
Grass with woody plants	4	Comments:	
Cultivated crop ground	6		
Bare earth	10		

8. Buffer size

>2X pen area	1		Risk = ____
1 - 2X pen area	4	Comments:	
0.5 - 1X pen area	7		
<0.5X pen area	10		

9. Extraneous drainage

< 1X pen area	1		Risk = ____
1X - 3X pen area	4	Comments:	
3X - 5X pen area	7		
>5X pen area	9		

10. Annual rainfall

< 20 inches per year	1		Risk = ____
20 -25	3	Comments	
25 - 30	5		
30 - 35	7		
35 -40	9		
>40 inches	10		

11. Rainfall intensity (25year-24 hour storm)

< 4.5 inches	1		Risk = ____
4.5 - 5	3	Comments:	
5 - 5.5	5		
5.5 - 6	7		
6 - 6.5	9		
>6.5 inches	10		

Section C **Groundwater Protection**

1. Capacity (AUs)

	Threat Factor		Risk = ____
<50	1	Comments:	
50 - 100	3		
100 - 300	5		
300 - 500	7		
500 - 700	8		
700 - <1000	9		

2. Annual rainfall

< 20 inches per year	1		Risk = ____
20 -25	3	Comments:	
25 - 30	5		
30 - 35	7		
35 -40	9		
>40 inches	10		

3. Depth to groundwater

>150 feet	1		Risk = ____
25 - 150 feet	3	Comments:	
10 - 25 feet	6		
5 - 10 feet	8		
< 5 feet	10		

4. Soils receiving runoff

Clay	1		Risk = ____
Silty Clay	3	Comments:	
Silt	5		
Silty Sand	7		
Sand	9		

5. Distance to nearest well (water, gas, oil) potentially impacted (down gradient)

>600 feet	1		Risk = ____
200 - 600	3	Comments:	
100 - 200	5		
50 - 100	7		
0 - 50	9		
0	10		

Section D **Special Conditions**

1. Springs, seeps, rock outcrops in pens or direct runoff area	Yes	No
2. Located in a Sensitive Groundwater Area	Yes	No
3. Is the protected water body an Outstanding Natural Resource Water or Special Aquatic Life Use Surface Water?	Yes	No

Section E **Evaluation**

1. Section A - any yes answer requires controls and a permit.

2. Section B - Sum of risk values >60 is a significant pollution potential which requires controls and a permit or modification for operations.

B1 + B 2 + B 3 + B 4 + B 5 + B 6 + B 7 + B 8 + B 9 + B 10 + B 11 = Surface Water Potential

___ + ___+ ____+ ___ + ___ + __ + ___ + ___ + __ + ____ + ____ = _____

3. Section C - Sum of risk values >25 is a significant pollution potential which requires controls and a permit or modification of operations.

C 1 + C 2 + C3 + C4 + C5 = Groundwater Potential

___ + ____ + ___+____+____ = _____

4. Section D -

If D1 or D2 is yes and Groundwater Potential is >20 a permit is required.
If D3 is yes and Surface Water Potential is >50 a permit is required.

5. Section E - If facility evaluation does not require a permit, the facility is eligible for certification. Prior to the certification, the inspector shall review all applicable separation distances for final eligibility determination.

Division of Conservation - Kansas Department of Agriculture

Livestock Waste Management Application for Supplemental Cost-Share

FY _____

County: _____

Type of System (beef, dairy, swine): _____

Animal Units – Current: _____ Planned: _____

Total Cost (not only cost-share): $ _____

Cost-Share Provided by District: $ _____

Supplemental Cost-Share Requested by District: $ _____

Significant Pollution Potential Score: _____

Target Area (TMDL, state, local) explain: _____

Relocation of facility: Yes☐ No☐

Project funded in combination with EQIP: Yes☐ No☐

Applicant Contacted by KDHE? (explain status):

Other Relevant Information:

Submit to DOC

Pipe and/or Cable Perimeter Fencing Specifications

Code No. 382
(Applicable to Livestock Waste Systems)

POLICY

This practice applies only to the relocation of livestock facilities when the current site is found unsuitable to achieve compliance with state and federal pollution control laws and regulations. Cost-Share eligibility for pipe and/or cable perimeter fencing applies only if pipe and/or cable perimeter fencing was present at the abandoned site. Sucker rod is eligible when used singularly or in conjunction with either pipe or cable fencing providing the top member is a minimum 2" diameter pipe. All fences are built to a minimum height of 5'.

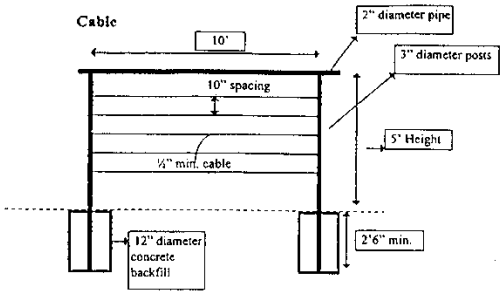
Perimeter Fencing Specifications

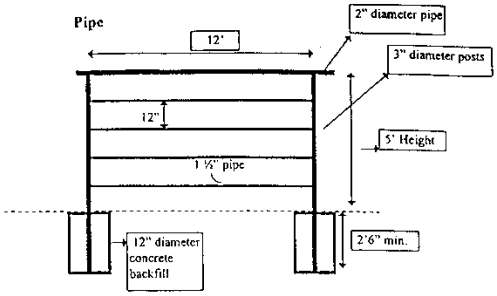
Fencing Material	No. of Members	Member Spacing	Remarks
Pipe	4*	12"	Min. Dia. 1 ½"
Sucker Rod	4*	12"	Weld or thread joints
Cable	5*	10"	½ "min. dia. spring tension

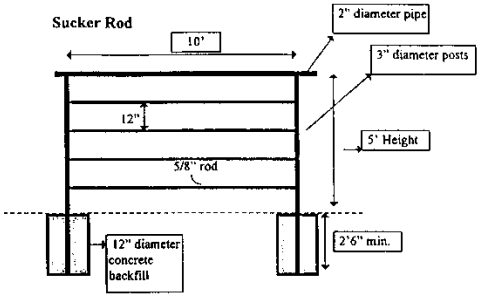
Posts - pipe only, 12' on center for pipe (10' o.c. for sucker rod and cable), minimum 3" diameter posts, 2'6" minimum depth in ground with 12" diameter concrete backfill (for rocky soils where 2'6" cannot be achieved, use additional concrete backfill or decrease post spacing).

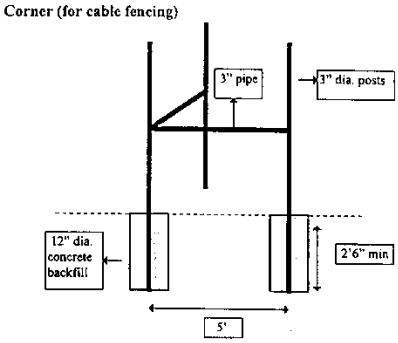
*Members listed do not include a required top member consisting of a minimum diameter pipe of 2".

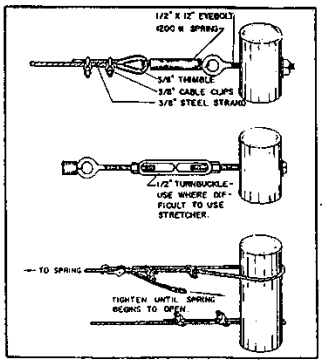
See next page for design examples.


Cable
10'
2" diameter pipe
3" diameter posts
10" spacing
5' Height
¼" min. cable
12" diameter concrete backfill
2'6" min.


Pipe
12'
2" diameter pipe
3" diameter posts
12"
5' Height
1 ½" pipe
12" diameter concrete backfill
2'6" min.

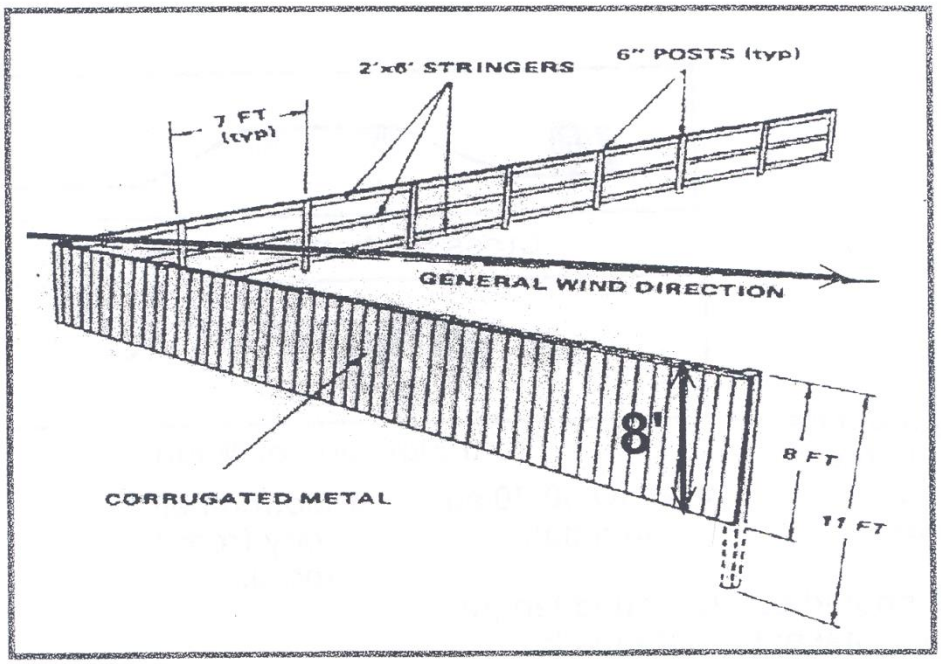

Sucker Rod
10'
2" diameter pipe
3" diameter posts
12"
5' Height
5/8" rod
12" diameter concrete backfill
2'6" min.


Corner (for cable fencing)
3" pipe
3" dia. posts
12" dia. concrete backfill
2'6" min.
5'

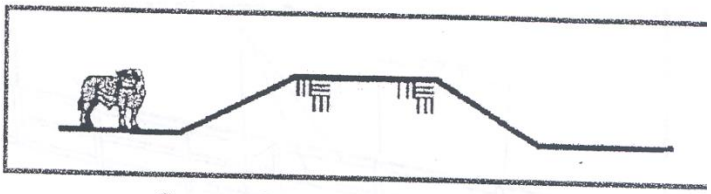

1/2" X 12" EYEBOLT
3/8" THIMBLE
3/8" CABLE CLIPS
3/8" STEEL STRAND
1/2" TURNBUCKLE - USE WHERE DIFFICULT TO USE STRETCHER.
TO SPRING
TIGHTEN UNTIL SPRING BEGINS TO OPEN

Constructed Windbreak:

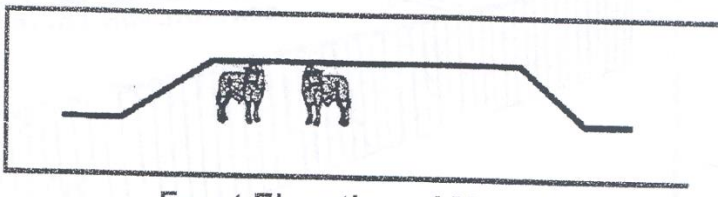
NOTE: Pipe stringers and posts may be 3" or 4" diameter.



Earthen Berms:



Cross Section of Mound



Front Elevation of Mound

- Loafing mounds can be altered to serve as a windbreak.
- Mounds should be oriented east-west for best protection.
- Allow 30-40 sq. ft./animal.
- Mound length should be 18"/head .
- Mound height can vary from 5'- 6' or more.

Field Windbreak Specifications

Outdoor Living Barn:

Outdoor Living Barn: A Specialized Windbreak

Kris Irwin, Public Service Assistant, Warnell School of Forest Resources, University of Georgia; and Jerry Bratton, Technology Transfer Program Leader, National Agroforestry Center

In April of 1987, a spring blizzard swept through northern Kansas and southern Nebraska killing nearly 60,000 newborn calves and other winter stressed animals. This tremendous loss could have been lessened had protection, such as outdoor living barns (OLB), been provided to reduce the windchill. An outdoor living barn is a specialized windbreak, typically composed of trees and shrubs, and strategically located in open grasslands, center pivot irrigation corners, and pasture areas to protect livestock during severe weather situations.

The purpose of an OLB is to: 1) defuse and deflect cold winds away from livestock, moderating the windchill; and 2) trap and hold blowing snow, preventing it from covering feed, water, and livestock. Outdoor living barns pay for themselves by cutting livestock losses, lowering feed costs, and sustaining animal health during stressful weather conditions.

Design

The following OLB designs are given as guidelines and should be adjusted to meet local conditions, constraints, and landowner objectives.

Shape: typically in the form of a "U" or upside down "L" as shown in Figure 1.

Figure 1 — Various design configurations of outdoor living barns.

Orientation: perpendicular to prevailing winter and early spring wind direction.

Number of rows: ranges from three to five, and if there is adequate space, more rows may be added. To control high snow levels, design OLB's with a "trip row" to trap snow before it reaches the windbreak. The trip row should be planted to attain a 60-80 percent density and be located at least 100 feet upwind from the outside row of the windbreak. Figure 2 shows an example OLB design with a trip row.

National Agroforestry Center

Table 1: Minimum area requirements for livestock in confined areas.

	Cattle			
	Beef	Cow/Calf	Sheep	Swine
Area Requirement (ft^2/animal)	25-35	40	8-10	15-20

Length: depends on the number of animals requiring protection and the minimum area requirement of confined livestock (table 1).

Example

Design an OLB for 50 brood cows held in an open pasture. Assumptions: 1) landowner wants a three-row design with a "trip row" (figure 2), and 2) mature tree height (H) of conifer species is 30 feet. First, determine interior top and side row lengths. Measurements of the inside rows are calculated as follows (figure 2):

1. Protection Pocket Size (PPS) — the minimum size of area for confined livestock:
   Formula: # livestock x required area (ft^2)/head {table 1} = PPS
   Example: 50 brood cows x 40 ft^2 = 2000 ft^2

2. Length of interior top row (LTR)
   Formula: ($\sqrt{PPS}$ x 4) + 40 ft = LTR
   Where: the square root of the PPS mulitplied by 4 represents the length outside of the exclusion fence on the interior of the OLB, to allow the herd to roam. The addition of 40 feet is the sum of the added distance required for location of the fence (20 feet for both ends).
   Example: ($\sqrt{2000}$ x 4) + 40 ft = (45 x 4) + 40 = 220 ft (LTR)

3. Length of interior side rows (LSR):
   Formula: $\sqrt{PPS}$ + 5(H) + 100 ft = LSR
   Where: 5(H)** equals five times the mature height of the tallest tree in the OLB, the addition of 100 feet is recommended to reduce wind eddy effects and keep "end drifts" out of the OLB.
   Example: $\sqrt{2000}$ + 5(30) + 100 ft = 45 + 150 + 100 = 295 ft (LSR)

   ** In areas of high snow accumulation (Minnesota, Wisconsin, North Dakota, South Dakota, Wyoming, Montana) this figure may be increased to as much as 10(H) to accomodate large drifts and not create "death traps."

The calculated LTR and LSR are 220 feet x 295 feet, respectively (figure 2). Now, the remaining outside rows can be established using appropriate "between row" distances. The formulas for LTR and LSR presented above are to be used as guidelines, and should be adjusted on an individual project basis to provide proper dimensions. When designing an OLB, it is important that the dimensions of the planting: 1) meet landowner objectives; 2) are adjusted to accomodate animal species and site conditions; 3) allow adequate space for feeding and a water source; and 4) provide maximum protection from severe local weather events.

Species

Trees are typically planted for an OLB, but as with other windbreak designs, a mixture of tree and shrub species is recommended. The height and density of a windbreak determines its effectiveness (percent of wind speed reduction). Deciduous and some coniferous tree species will provide the effective height attribute, while coniferous tree species

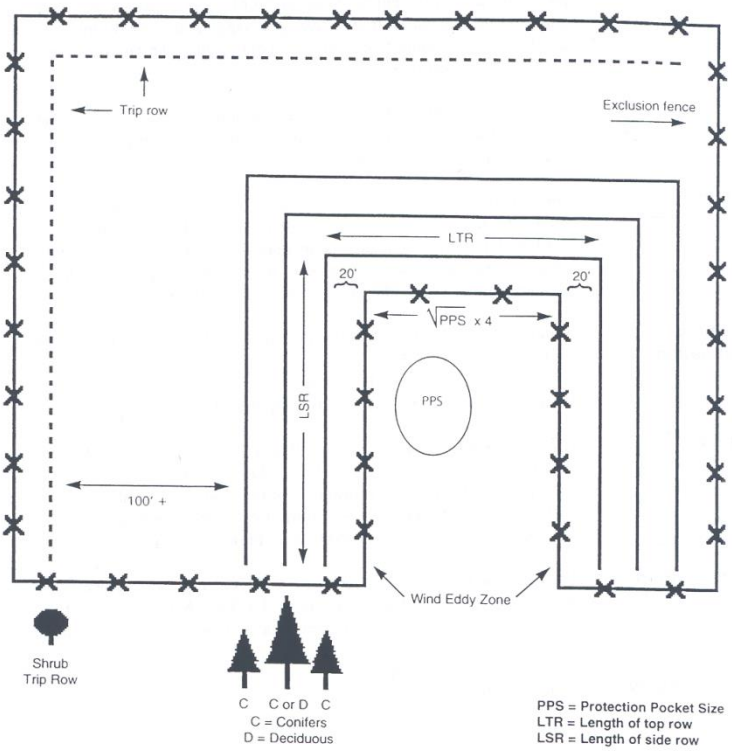


Figure 2 — Possible Outdoor Living Barn design configuration with a trip row.

are best for regulating lower level density. An OLB with a "trip row" should have a density of 40 to 60 percent; otherwise the OLB density should be 60 to 80 percent.

Location

Livestock drift with the direction of the storm. For example, if a late winter storm comes out of the northwest, the herd will "drift" to the southeast corner of the pasture. Therefore, locate the OLB in the area of the pasture where the herd would most likely congregate during a typical storm event. Locate the OLB close to a permanent water source like a stock tank. Also, the OLB should be readily accessible by vehicle to facilitate livestock feeding and veterinary activities during extreme weather. It's important that surface water drainage be away from the protection pocket to keep livestock dry and out of mud as much as possible.

Maintenance

It is critical that livestock be excluded from an OLB planting. Construct a stout fence or electrified wire fence at least 20 feet away from the tree rows. This will

protect the trees from damage by animal rubbing or grazing. Place a top rail on a wire fence to keep snowdrifts from breaking or sagging the wire. Eliminate competition from weeds and other plants. Continue weed control until the canopy closes and effectively shades out competition.

The objective of an OLB is to create a continuous vegetative barrier. Gaps in the planting will funnel wind and snow through the barrier and into the protected pocket. Replant gaps created by loss of plants as soon as possible.

Summary

There are many acres of open grasslands and pasture that could offer excellent winter grazing for livestock, if adequate protection from adverse weather is provided. Investing in a long-term living structure that increases survival of newborns, reduces winter and summer stress, decreases feeding costs, and at the same time provides wildlife habitat is a wise investment. An outdoor living barn may be the answer.

Additional Information

"Cutting Energy Costs with Trees, Livestock Protection, Windbreaks, and Outdoor Barns." Wyoming Association of Conservation Districts, 2505 East Fox Farm Road, Cheyenne, WY 82007. Phone: 307-632-5716.

Windbreak Technology Short Course, Student Handbook. NRCS.

Authors

Kris Irwin, Public Service Assistant, Warnell School of Forestry, University of Georgia, Athens, Georgia 30602-2152. Phone: 706-542-7412.

Jerry Bratton, Technology Transfer Program Leader, National Agroforestry Center, USDA Forest Service/USDA Natural Resources Conservation Service, East Campus-UNL, Lincoln, Nebraska 68583-0822. Phone: 402-437-5178, ext 24.

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Filing Category

Conservation Agroforestry

The National Agroforestry Center is a partnership of the USDA Forest Service and the USDA Natural Resources Conservation Service.

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