NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

LIVESTOCK COOLING POND

(Acre)
Code 779

DEFINITION

A water impoundment made by excavating a pit or dugout with a ramp for livestock access.

PURPOSES

To reduce heat stress on domestic livestock and maintain or improve water quality.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where existing methods of cooling dairy cows are inadequate and where cooling ponds can be installed and operated in a manner that will not cause environmental degradation of water resources.

CRITERIA

General Criteria Applicable to All Purposes

Laws, Rules, and Regulations. Plan work to comply with all Federal, state, and local laws, rules, and regulations. Verify if cooling ponds need to be permitted by the Florida Department of Environmental Protection, Water Management District, or other permitting agency. Refer to Chapter 62-522 Florida Administrative Code (F.A.C.), Chapter 62-620 F.A.C., Chapter 62-621 F.A.C., and Chapter 62-670 F.A.C. for permitting requirements.

Impact to cultural resources, wetlands and Federal and state protected species shall be evaluated and avoided or minimized to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part401, Title 190-Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), National Food Security Act Manual (NFSAM), and the National Environmental Compliance Handbook (NECH).

Site Investigation. Base site suitability and design on adequate investigations and surveys as described in the National Engineering Field Handbook (NEH) Part 650, Chapter 11, Ponds and Reservoirs and Agricultural Waste Management Field Handbook, Part 651, Chapter 8, Siting AWMS.

Site Conditions. If during the risk assessment, it is determined that the site is a potential hazard to ground water pollution, design cooling ponds with a liner to prevent contamination of ground water. Methods to maintain the liner integrity shall be considered in the design. Refer to Florida conservation practice standard Waste Storage Facility, Code 313 for liner alternatives.

If cooling pond is located in high water table soils (poorly drained to very poorly drained), design cooling pond with a detailed risk assessment. Include an analysis of the potential for ground water pollution considering the hydrogeology, ground water transmissivity, soil permeability, etc. in the risk assessment. Provide reasonable assurances that the facility will not cause surface or ground water pollution when the decisions are made to install livestock

cooling ponds in high water table soils without liners.

Design. Ensure an adequate water source and pump are available to maintain the design depth in the cooling pond. Protect the liner from livestock damage.

Install cooling ponds in high water table soils that permit storage of water at a depth and volume that ensures a dependable supply with minimal seepage loss. Consider the ground water recharge rate when locating the cooling pond in high water table soils. Determine adequacy of water supply based on long term water table depths, soil survey data, and experience.

Verify the site topography to be such that runoff to the cooling pond from outside drainage areas will not cause water quality degradation or can be safely diverted away from the cooling pond.

Design cooling ponds not to effect the volume or quality of downstream water resources.

Location. To minimize the potential for contamination of streams, locate livestock cooling ponds outside of floodplains. However, if site restrictions require location within a floodplain, protect livestock cooling ponds from inundation or damage from a 25-year, 24-hour storm event, or a larger storm event if required by laws, rules, and regulations. Locate livestock cooling ponds in areas so the potential impacts from breach of embankment, accidental release, and liner failure are minimized. Locate livestock cooling ponds in areas where separation distances are such that prevailing winds and landscape elements such as building arrangement, landforms, and vegetation minimize odors and protect aesthetic values.

Locate unlined cooling ponds with a sufficient distance from any streams, canals, and surface water bodies such that subsurface lateral flow from the cooling pond will not adversely affect the water quality of nearby water bodies. Locate unlined cooling ponds a minimum of 500 feet from channels or streams, unless an analysis shows closer distances will not adversely affect water quality in nearby channels or streams.

Verify minimum distances as required by Florida NRCS conservation practice standard Filter Strip, Code 393, or other approved method.

Locate cooling ponds to minimize or eliminate livestock access to drainage swales or other areas that could cause an increase in off-site discharge of nutrients and sediments. Where needed, install water control structures in drainage swales to provide access to cooling ponds and prevent livestock from entering watercourses.

Where cooling ponds are installed as part of a grazing system, design all units in the grazing system to have access to at least one pond. Rotate livestock in grazing systems to maintain healthy vegetation and distribute animal waste in accordance with Florida NRCS conservation practice standard Prescribed Grazing, Code 528.

Dike. If drainage from surrounding land areas for a 25-year frequency, 24-hour duration storm can cause surface water discharge from the cooling pond, then design the cooling pond with dikes of sufficient height to prevent outside runoff water from entering the pond and to prevent any surface water from the pond or neighboring high traffic areas within the pond from discharging. Install the dikes a minimum of 50 feet from the top edge of the excavated pond side slope to allow for a lounging area for livestock and capture waste from livestock using the cooling pond.

Height. Design dike height to be sufficient to prevent inflow and outflow from the pond for a 25-year frequency, 24-hour duration storm. Design dikes with a minimum height of 1 foot above natural ground and not to exceed 3 feet in height above natural ground.

Top Width. Design the dike top width to be a minimum of 4 feet.

Size. Design cooling pond with a minimum size of 15 square feet of surface area per animal. For design purposes, base the surface area on the water depth of the pond during normal rainfall years.

Depth. Construct the depth of unlined cooling ponds to be a maximum of 4 feet below the seasonal low water table. Design depth of lined cooling ponds to be a minimum of 4 feet. Include additional depth for sedimentation, evaporation, and seepage losses.

Side slopes. Stabilize side slopes of excavated ponds and construct side slopes not to be steeper than one horizontal to one vertical (1:1). Provide an access ramp of ample width. Extend the ramp to a depth of at least 3 feet below the anticipated low water elevation at a slope no steeper than four horizontal to one vertical (4:1).

Excavated material. Place the material excavated from the pond as needed to accomplish the purposes of this practice. Uniformly place or shape reasonably well the excavated material, with side slopes assuming a natural angle of repose. Haul excess material off-site or use excess material for other beneficial purposes.

Protection. Seed the exposed surfaces of the dike and all areas disturbed during construction as necessary to prevent erosion. Vegetate areas in accordance with NRCS Florida conservation practice standard Critical Area Planting, Code 342.

Where cooling ponds are required to be lined with a clay or geomembrane liner, protect the liner from livestock damage. Provide protection by maintaining a minimum of one foot of earth cover over the liner.

Closure. Close cooling ponds taken out of commission in accordance with NRCS Florida conservation practice standard Closure of Waste Impoundments, Code 360.

CONSIDERATIONS

Consider cooling ponds having some affect on the water budget, especially volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation, and ground water recharge. Consider the affect of the reduction in peak discharge and in many instances reduction to zero during dry periods for other uses or to other users. Consider increase in recharge to the ground water due to seepage or decrease due to increased evapotranspiration and the extension of base flow for a longer period of time.

Consider the increase in nutrient concentrations in the cooling pond and adjacent area due to the cooling pond trapping nutrients, organic matter and sediments.

Consider the effect of visual quality of onsite and downstream water resources. Consider the visual design of ponds where constructed in areas of public visibility. The underlying criterion for all visual design is appropriateness. Consider relating visually the shape and form of ponds, excavated material, and plantings to their surroundings and to their function. Consider shaping dikes to blend with the natural topography. Consider shaping the excavated material so that the final form is smooth, flowing, and fitting to the adjacent landscape rather than angular geometric mounds.

In order to maintain dike stability and height, consider fencing the inside top toe to limit or prevent livestock traffic on the dike.

To reduce waste in the cooling pond and adjacent areas, consider preventing livestock access during cooler periods when livestock heat stress is not a concern.

Consider limiting the loafing area around the cooling pond to encourage livestock to return to the pasture area.

Consider the short-term and construction-related effects of this practice with the quality of downstream watercourses. Consider installation of appropriate pollution control devices to minimize the adverse effects during construction.

During the construction of ponds, consider the potential for earth moving to uncover or redistribute toxic materials. If toxic materials are found, clean-up and dispose of toxic materials according to all applicable rules and regulations.

Consider economics and safety and health factors, including other methods to reduce animal heat stress such as shade structures, fogged misters, modification of livestock diet, etc.

Consider the use of amendments to reduce ammonia and other emissions from manure in confined spaces that may allow altered ventilation strategies at an appreciable energy savings. Consider the reduction of ammonia emissions to increase the proportion of nitrogen in the manure.

PLANS AND SPECIFICATIONS

Prepare plans and specifications prepared in accordance with the criteria of this standard and describe the requirements for applying the practice to achieve its intended purpose(s). As a minimum, provide the following in the plans and specifications:

- Location of cooling pond(s) including setback distances form water bodies, streams, other sensitive areas, etc.
- Dimensions of cooling pond including depth, length, width, side slopes.

- If a liner is required, type and thickness and method for protection.
- Placement of spoil.
- Dike requirements including distance from top edge of pond, height, top width, side slopes.
- Number of animals served.
- Vegetative establishment requirements.

Copies of the plans and specifications shall be given to the landuser.

OPERATION AND MAINTENANCE

Develop an operation and maintenance (O&M) plan that is consistent with the purposes of the practice. Review with the operator and owner a site specific (O&M) prior to implementation of the practice. Include in the O&M plan, but not be limited to, the following provisions in the plan:

Clean the cooling pond at least once a year. Change the water as often as possible while the cooling pond is in use. Treat water from cooling ponds in waste treatment systems and/or land applied in accordance with Florida NRCS conservation practice standard Nutrient Management, Code 590. To facilitate removal of water from cooling ponds, pump during times of low temperatures when the pond is not required for cooing livestock.

Periodically remove accumulated sediment from the bottom of cooling ponds to maintain a satisfactory depth. Apply or dispose sediments in accordance with Florida NRCS conservation practice standards Nutrient Management, Code 590 and/or Waste Waste Utilization, Code 633.

Inspect cooling periodically and especially after heavy rains to determine whether it is functioning properly or if repairs are needed.

Maintain and repair dikes to design dike height.

Maintain vegetative cover of the dike by mowing and fertilization when needed.

REFERENCES

Agricultural Waste Management Field Handbook, Part 651, Chapter 8, Siting
Chapter 62-522, Chapter 62-620, Chapter 62-621, and 62-670 F.A.C.
Florida NRCS conservation practice standards
Closure of Waste Impoundment, Code 360
Critical Area Planting, Code342
Filter Strip, Code 393
Nutrient Management, Code 590
Prescribed Grazing, Code 528
Waste Storage Facility, Code 313
Waste Utilization, Code 633
General Manual
Title 420-Part 401
Title 450-Part401
Title 190-Parts410.22 and 410.26
National Cultural Resources Procedures Handbook
National Environmental Compliance Handbook
National Food Security Act Manual
NEH Field Handbook Part 650, Chapter 11, Ponds and Reservoirs
National Planning Procedures Handbook
Florida Supplements to Parts 600.1 and 600.6