Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

WATERING FACILITY

CODE 614

(no)

DEFINITION

A watering facility stores or provides drinking water to livestock or wildlife.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Supply daily water requirements
- Improve animal distribution
- Provide a water source that is an alternative to a sensitive resource

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility.

This practice is not intended for constructed earthen embankment or excavated ponds. For ponds, refer to NRCS Conservation Practice Standard (CPS) Pond (Code 378).

CRITERIA

General Criteria Applicable to All Purposes

All planned work must comply with Federal, State, Tribal, and local laws and permit regulations.

Capacity

Identify the type of livestock or wildlife that will be the primary users of the facility. If the watering facility will supply water to different species of animals, provide sufficient water to meet the sum of the seasonal high daily water requirements for all of the animals.

Refer to the NRCS National Range and Pasture Handbook (Title 190), Chapter 6, “Livestock Nutrition, Husbandry, and Behavior,” State guidance, or university publications for information on livestock water quantity and quality requirements. For wildlife, base water quantity and quality requirements on targeted species needs.

User needs

Design the watering facility so that access is adequate to accommodate the number of animals that will be drinking at the same time. Include design elements to meet the specific needs of the primary users. Include specific design needs such as antler size, species, and ingress and egress requirements.

Materials and appurtenances
Construct the watering facility from durable materials that meet or exceed the lifespan of the practice. Follow NRCS design procedures for the selected materials. Use industry standards where NRCS procedures do not exist.

Stabilization of disturbed areas
Stabilize areas disturbed by construction in accordance with the planned use of the facility. Use the criteria in NRCS CPS Critical Area Planting (Code 342) to establish vegetation. If establishment of vegetation is precluded by site conditions, use the criteria in NRCS CPS Mulching (Code 484), as appropriate.

Troughs and tanks
Capacity
Design troughs and tanks with the storage volume necessary to provide water between periods of replenishment. To determine the storage volume, use the availability of water, replenishment rate, location, and planned operation.

Location
Locate the watering facility to meet the needs of the managed livestock or wildlife species. Select a site that will promote even grazing distribution and reduce grazing pressure on sensitive areas. Where multiple watering facilities are planned, place the watering facilities at distances that are appropriate for the given topography, climate, and species that will be managed.

Locate the watering facility to minimize erosion problems caused by animal traffic on steep topography.

When a watering facility is installed adjacent to a well, provide positive drainage away from the well head.

Foundation
Install the watering trough or water storage tank on a firm, level foundation that will not settle differentially. Examples of suitable foundation materials are bedrock, concrete, compacted gravel, and stable, well-compacted soils. Where necessary, prepare the foundation by removal and disposal of materials that are not adequate to support the design loads.

Anchor or brace the watering facility as needed to prevent overturning by wind and animals, or as required by the watering facility manufacturer.

Tanks
Analyze the foundation conditions and provide a design that will ensure the stability of the storage tank. For a vertical storage tank with a tank height greater than the tank diameter, also analyze the potential for overturning and identify the anchoring requirements.

Use NRCS design procedures or manufacturer's guidelines to ensure that buried tanks will withstand all earth and vehicle loads anticipated for the site.

Stabilization
For a permanent trough, protect the area around the watering facility where animal concentrations or overflow from the watering facility will cause resource concerns. Use NRCS CPS Heavy Use Area Protection (Code 561) to design the protection.

For a portable facility, either stabilize as mentioned above or move the trough when needed to prevent damage from animal concentrations.

Appurtenances
Use the criteria in NRCS CPS Livestock Pipeline (Code 516) to select the components needed to attach the water supply to the trough. Include backflow prevention devices or an air-gap on facilities connected to wells or to domestic or municipal water systems. If an air-gap is used, it must be at least twice the inside diameter of the supply pipe or valve opening, or 1 inch, whichever is greater.

When an overflow pipe is included in the design, protect the outlet from damage and provide a stable outlet for the overflow. Direct overflow from the trough to another beneficial use or to the original watercourse, if possible.

Where water is supplied under pressure to the watering facility, use an automatic water level control or float valve to control the flow of water to the facility to reduce energy use and prevent overflows.

As needed, install a float valve on a gravity-fed trough to avoid draining the water source.

Protect valves and controls from damage by livestock, wildlife, freezing, and ice.

Escape features

For sites west of the 100th meridian, incorporate escape features for wildlife into the design of an open-surface watering facility. For sites east of the 100th meridian, install escape features where local knowledge and experience indicate that wildlife may be at risk of drowning.

An effective escape device must—

- Touch the inside wall of the tank or trough.
- Reach from the rim to the bottom of the trough or tank.
- Be firmly secured to the trough or tank.
- Be built of durable material with a rough surface that animals can grip.
- Have a slope no steeper than 45 degrees.
- Be located to cause minimal interference with livestock.

Provide one escape device for every 30 linear feet of rim.

Refer to Bat Conservation International's "Water for Wildlife—A Handbook for Ranchers and Range Managers" (Taylor and Tuttle, 2012) for additional information on escape features.

Watering ramps

Where livestock or wildlife will drink directly from a pond or stream, use a watering ramp to provide stabilized access to the water. Evaluate existing and proposed fences, grazing patterns, shoreline slope, and water depth when choosing the optimum location for the ramp.

Width

Make the ramp wide enough to accommodate the expected usage.

Length

Extend the ramp into the stream or pond far enough to achieve the desired depth.

Surface drainage

Divert surface runoff from the approach to the ramp.

Slope

Make the slope of the watering ramp consistent with planned animal usage but not steeper than 3 horizontal to 1 vertical (3:1).

Side slopes

Make all side slope cuts and fills stable for the soil materials on the site. Make the side slope cuts or fills in soil materials no steeper than 2 horizontal to 1 vertical (2:1). Make rock cuts or fills no steeper than 1.5 horizontal to 1 vertical (1.5:1).

Foundation

Where necessary, prepare the foundation by removal and disposal of materials not adequate to support the design loads.

Surface material
Use the criteria in NRCS CPS Heavy Use Area Protection (Code 561) to design the ramp surface. The selected material must be of adequate quality to withstand underwater conditions.

Access
Use fencing or other barriers to delineate the boundaries of the ramp. Barriers must be of sufficient size, strength, and quality to meet the intended use of the facility.

Ramps in streams
If there is a need to provide a stream crossing in conjunction with a watering facility, use the criteria in NRCS CPS Stream Crossing (Code 578) for the design and construction of ford crossings, except as noted above in Watering Ramps.

Locate the watering ramp so that it does not impede the movement of aquatic organisms in the stream.

Ramps in ponds
Extend the ramp into the pond until a minimum water depth of 3 feet is reached, measured from the design normal water level. Where the pond depth is greater than 3 feet at the ramp location, excavate the ramp into the pond bank or use other means to provide a stable base at the lower end. Extend the ramp a minimum of 0.5 feet above the normal water level.

Fencing
Use criteria found in NRCS CPS Fence (Code 382) for the design and construction of fences associated with the watering facility. Ensure designs that allow safe ingress and egress for area wildlife species. To protect species that access water by skimming across the surface, make fencing materials highly visible with appropriate openings. Add permanent streamers or coverings to wire fences that extend across a watering facility to make them more visible to skimmers.

CONSIDERATIONS

General Considerations

Consider the implementation of NRCS CPS Prescribed Grazing (Code 528) when installing a watering facility to address water quality and animal distribution resource concerns.

When possible, locate the watering facility away from streams, ponds, or riparian areas to minimize chance of fecal contamination or surface pollution.

Consider the quality of the water provided to the watering facility and the effects on animal health, animal production, water intake, and feed and forage consumption.

Not all species need or benefit from supplemental water. Consider impacts to both target and nontarget wildlife species before installation of a watering facility. Observed or documented use of a facility by wildlife does not necessarily indicate net benefits. Introducing a new water source within an ecosystem can have effects such as the concentration of grazing, predation, entrapment, drowning, disease transmission, and expansion of the wildlife populations beyond the carrying capacity of the available habitat. Providing a water source for wildlife could enhance the habitat for species that compete with or prey on at-risk species.

Consider designing the facility to benefit wildlife. Such designs would include providing ground-level access to water for species that cannot use raised structures, such as troughs. Ground-level access can be provided through creation of an overflow collection area or a secondary ground-level water source. Depending on the target species, planners may want to consider protecting these areas using suitable fencing (marked as needed) that excludes livestock and larger wildlife species while allowing access of the site to small ground-dwelling species.

Wildlife populations within desert or arid regions of the country can become dependent on supplemental watering facilities. Consideration should be given to maintaining year-round water even if livestock are not present.

Consider disease transmission prevention at watering facilities. Consider suitable controls/treatments for local water-transmissible diseases and parasites.

When windmill, solar, or other potentially unreliable power sources are used, consider supplying additional daily water storage volume (3–5 days), a battery backup system, or an alternate water source.

Consider the effects of water development on the balance or budget of water resources in the area of the new project. In some settings, this could be important and may result in effects to adjacent or associated habitats and species.

If there is the potential for small livestock, such as lambs or kids, to fall into the trough, provide a ledge or similar structure in the trough to provide an escape route or provide a second trough that has a shorter height.

Debris and algae can collect in watering facilities resulting in the need for frequent cleaning. Covers that shade the facility and reduce debris from falling into the facility, while still allowing animal access, will keep the water cooler, cleaner, and more palatable to animals.

Where debris or algae is a problem, consider increasing pipe sizes for inlets and outlets or installing a feature such as an inverted elbow at the inlet to the overflow pipe to reduce the chances of clogging. Consider installing a method to completely drain the watering facility to increase the ease of maintenance. Protect the drain outlet from erosion.

Consider installation of a permanent means of ingress and egress for maintenance of a storage tank, where needed.

Additional Considerations for Watering Ramps

Where livestock exclusion from a stream is part of the planned installation, consider installing a watering ramp that can be used if emergency access to water is needed. Use a gate to restrict access to the ramp.

The slope of the ramp can influence animal behavior. Steeper slopes tend to discourage loitering in the ramp area.

Select a surface material for the ramp that will discourage loitering but still provide a stable footing. The larger stone will make the hoof contact slightly uncomfortable.

Avoid locating watering ramps in shady places, where possible, to discourage loitering.

Where possible, extend the fence completely across the stream. Use swinging gates to restrict animal movement.

PLANS AND SPECIFICATIONS

Provide plans and specifications that describe the requirements for applying this practice to achieve its intended purpose. As a minimum, include—

- A map or aerial photograph showing the locations of the facilities and any associated pipelines.
- Special conditions for access, as needed.
- Foundation stability requirements.
- Site-specific detail drawings showing the facility size, dimensions, and necessary appurtenances (foundations, pipes and valves, escape features, anchoring, outlet stabilization and protection, etc.).
- Requirements for stabilization of any areas disturbed by the installation of the facility.

- Fencing, as needed.
- Materials and quantities.
- Construction specifications describing the installation of the facility.

OPERATION AND MAINTENANCE

Prepare an operation and maintenance plan and review it with the operator. The plan will describe the actions that must be taken to ensure the facility functions properly for its design life. As a minimum, include—

- Regularly checking for damage to the facility. Check for leaks, site erosion, and damage to fences, heavy use areas, and appurtenances associated with the watering facility. Repair or replace damaged components as needed.
- Checking the performance of the automatic water level device, if present.
- Ensuring that the outlet pipe, if present, is freely operating and is not causing erosion.
- Cleaning the facility as needed.
- Monitoring and maintaining the facility to ensure that there is adequate inflow and outflow.
- Preparing the facility for winter as dictated by the climate. This may include draining supply pipes, emptying tanks, or ensuring that float valves will not be damaged by ice.
- For a portable facility, the plan for moving the facility and for monitoring/repair of the areas around the facility.

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