NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

WATERING FACILITY

(No.)

CODE 614

DEFINITION

A watering facility is a means of providing drinking water to livestock or wildlife.

PURPOSE

To store or provide designated access to drinking water for livestock or wildlife to:

- 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.

CRITERIA

Consistent with Governor's Executive Order 2011-5, within sage-grouse core areas, this practice is not applicable on sage-grouse leks.

On sites within 0.6 miles of sage-grouse leks and within core areas, construction activities associated with this practice will not be conducted from March 15 to June 30. Variances may be granted on a case by case basis with Wyoming Game and Fish concurrence.

Capacity. Identify the type of livestock or wildlife that will be the primary user(s) 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 of all the animals.

Refer to the National Range and Pasture Handbook (Chapter 6), the Wyoming Livestock Water and Pipeline Handbook, 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. Except for watering facilities installed in corrals, required access area shall meet the requirements as specified in Section 2.5 of the Wyoming Livestock Water and Pipeline Handbook. Include design elements to meet the specific needs of the primary user(s). Examples of specific design needs would include accommodation for 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 standards do not exist.

Conservation practice standards are periodically reviewed and updated. The current version of this standard can be obtained from your local Natural Resources Conservation Service office or can be downloaded from the electronic Field Office Technical Guide for Wyoming (Section IV, Conservation Practices) at http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=WY

Use the following guidelines for materials commonly used for watering facilities.

Concrete	3000 psi compressive strength
Galvanized Steel	20 gauge thickness
Galvanized Corrugated Bottomless Tank	12-gauge thickness
Plastic	Ultraviolet resistance
Fiberglass	Ultraviolet resistance

Stabilization of Disturbed Areas. Vegetate or stabilize areas disturbed by construction in accordance with the planned use of the facility. Use the criteria in NRCS Conservation Practice Standard (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.

Monitor disturbed soil areas to enable early detection and control of invasive plants.

Troughs and Tanks

Capacity. Design the watering facility with the storage volume necessary to provide water between periods of replenishment. Base the additional storage volume on the availability of water, replenishment rate, location, and planned operation.

The storage capacity of the water facility shall be adequate to provide emergency storage to the watering facility during times when water cannot be delivered. This storage may be supplied by gravity flow from an external storage tank or reservoir or within the facility itself. The storage amount should be based on type of water and power supply, location and planned operation. Animal water requirements and minimum storage volumes shall meet the requirement in Table 2.1 and Table 2.5, respectively, of the Wyoming Livestock Water and Pipeline Handbook.

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 species that will be managed.

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

When a watering facility is installed adjacent to a well, provide positive drainage away from the well head. Watering facilities installed adjacent to wells (within 50 feet) shall have an overflow which outlets at least 50 feet from the well.

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 to prevent overturning by wind and animals, if needed.

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 fixed trough, protect the area around the watering facility where animal concentrations or overflow from the watering facility will cause resource concerns. The site shall be well drained; if not, drainage measures shall be provided. Areas adjacent to the trough or tank that will be trampled by livestock shall be graveled, paved, or otherwise treated to provide firm footing and reduce erosion. Use NRCS CPS *Heavy Use Area Protection (Code 561)* to design the protection.

For a portable facility, move the trough frequently 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 on facilities connected to wells or to domestic or municipal water systems.

Provide a stable outlet for the overflow pipe when an overflow pipe is included in the design. Protect the outlet from damage. Direct overflow from the trough to another beneficial use or to the original watercourse, where 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 in order 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. Incorporate escape features for wildlife into the design of an open-surface watering facility

An effective escape device must:

- Meet the inside wall of the tank or trough
- Reach to the bottom of the trough or tank
- Be firmly secured to the trough rim
- Be built of durable material with a rough surface 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 *Water for Wildlife – A Handbook for Ranchers and Range Managers*, Bat Conservation International, 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 a stabilized access to the water. Evaluate the 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 3:1.

Side slopes. Make all side slope cuts and fills stable for the soil materials on the site. Make the side slopes of 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 material that are 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. Use NRCS CPS *Fence (Code 382)* for the design and construction of a fence. Barriers must be of sufficient size, strength, and quality to meet the intended use of the facility.

Ramps in Streams. Use the criteria in NRCS CPS *Stream Crossing (Code 578)* for the design and construction of a ford crossing except as noted above.

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

Ramps in Ponds. A minimum water depth of 3 feet, measured from the designed permanent

water level, is recommended. Where the pond depth is greater than 3 feet at the ramp location, it may be necessary to excavate the ramp into the pond bank to provide a stable base at the lower end. Extend the ramp a minimum of 0.5 feet above the designed permanent water level.

CONSIDERATIONS

Not all species need or benefit from supplemental water. Consider impacts to both target and non-target 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.

Design fences associated with the watering facility to 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.

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 is not present.

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 through the use of suitable fencing (marked as needed) that excludes livestock and larger wildlife species while allowing access of the site to small ground-dwelling species.

Consideration should also be given to prevention of disease transmission at watering facilities. Suitable controls/treatments for water-transmissible diseases and parasites should be considered if they are a problem locally.

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.

When a roof is placed over the trough to provide shade, design the roof for appropriate snow and wind loads and ensure that it will be durable to withstand anticipated livestock and wildlife activities. Use the criteria in NRCS CPS Roofs and Covers (Code 367) to design the roof.

Where debris or algae is a problem, reduce the chances of clogging by increasing pipe sizes for inlets and outlets or by installing a feature such as an inverted elbow at the inlet to the overflow pipe. Maintenance of a watering facility can be made easier by providing a method to completely drain the watering facility. Protect the outlet of a drain from erosion.

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

A watering facility located on a steep slope can have erosion problems from the animal traffic. The steep slopes may also cause problems with piping and valves from excess pressure. Choose the location of the watering facility to

minimize problems caused by steep topography.

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.

It is difficult to put a fence in the middle of a stream. Where possible, extend the fence completely across the stream. Swinging gates can be used 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 location of the facility and any associated pipelines
- Type and number of animals expected to use the facility.
- Special conditions for access, as needed
- Foundation stability requirements.
- Site-specific detail drawings showing the facility and necessary appurtenances (foundations, pipes and valves, escape features, anchoring, 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 that the facility functions properly for its design life. As a minimum, include the following items:

- Regularly check 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.
- Check the performance of the automatic water level device, if present.
- Ensure that the outlet pipe is freely operating and is not causing erosion.
- Regularly clean the facility.
- Maintain the facility to ensure that there is adequate inflow and outflow.
- Prepare 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, include the plan for moving the facility and for monitoring/repair of the areas around the facility.

REFERENCES

Brigham, William and Stevenson, Craig, 1997, Wildlife Water Catchment Construction in Nevada, Technical Note 397.

National Engineering Handbook, Part 650 Engineering Field Handbook, Chapters 5, 11 & 12, USDA Natural Resources Conservation Service.

National Range and Pasture Handbook, Chapter 6, Page 6-12, Table 6-7 & 6-8, USDA-Natural Resources Conservation Service.

National Research Council, 1996 Nutrient Requirements of Domestic Animals, National Academy Press.

Prescribed Grazing and Feeding Management for Lactating Dairy Cows", New York State Grazing lands and USDA NRCS, January 2000).

State of Wyoming, Governor's Executive Order 2011-5 and Attachments. Greater Sage-Grouse Core Area Protection. June 2, 2011.

Taylor, Daniel A. R. and Merlin D. Tuttle. Water for Wildlife, A Handbook for Ranchers and Range Managers. Bat Conservation International. 2012.

Tsukamoto, George and Stiver, San Juan, 1990. Wildlife Water Development, Proceedings of the Wildlife Water Development Symposium, Las Vegas, NV, USDI Bureau of Land Management.

Yoakum, J. and W.P. Dasmann. 1971. Habitat manipulation practices. Ch. 14 in Wildlife Management Techniques, Third Edition. Ed. Robert H. Giles, Jr. Pub. The Wildlife Society. 633 pp.