Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

SPRING DEVELOPMENT

CODE 574

(no)

DEFINITION

The collection and use of water from seeps or springs.

PURPOSE

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

- Improve water quantity for livestock and wildlife
- Improve water quality for livestock and wildlife

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to a site having a spring or seep with a dependable supply of suitable water for the planned use. Identify and evaluate alternative water sources before considering the development of a spring.

CRITERIA

General Criteria Applicable to All Purposes

Plan, design, and construct the practice to comply with all Federal, State, Tribal, and local laws and regulations. The landowner is required to obtain all necessary permits prior to construction. The landowner/contractor is responsible for locating all buried utilities in the project area including drainage tile and other structural measures.

Design the spring development to collect sufficient water for the intended purpose while protecting ecological functions of the site. Design the spring development to minimize the risk of damage and water contamination caused by freezing, flooding, livestock, sediment, and vehicular traffic.

Developing a spring for livestock water use may cause adverse impacts to fish and wildlife habitat. Develop only the necessary water for the planned purpose. Place a screen over open pipe vents to prevent wildlife entrapment and potential water contamination.

Conduct an evaluation of the site to determine—

- Water quantity and quality needed for the intended purpose.
- Suitability of the spring location.
- Soil and geologic suitability.
- Impacts to existing ecological functions benefiting from the spring and potential losses caused by the spring development, including impacts to local wildlife and wildlife habitat caused by the impoundment and/or diversion of spring water.
- Effects of consumptive use on riparian health and function, stream flow, water temperature, and

local aquifer recharge.
- Impacts to wetlands.

Source area
If possible, design the spring development to preserve the existing morphology of the spring. Locate the collection site down slope from the point where the spring or seep emerges.

Exclude livestock from the source area. Design livestock exclusion using NRCS Conservation Practice Standard (CPS) Fence (Code 382).

Where applicable, maintain fish and wildlife access to water provided by the spring development.

Develop the spring by removing obstructions to spring flow such as fine-grained sediments, rock, slope-wash materials, and vegetation. Design the spring development to prevent obstructions from reoccurring.

Collection system
Install a collection system to convey spring flows from the collection site to the point of use. The collection system typically consists of tile or perforated pipe, gravel, cutoff wall, spring box, conveyance pipe, or other collection means appropriate to the site. If necessary include measures to prevent sediment from entering the collection system. Construct the cutoff wall using concrete, clay, masonry, plastic sheeting, or sheet pile.

If the point of use is above the spring, base the type and size of the pump on available power sources and water delivery needs. Design the pump according to NRCS CPS Pumping Plant (Code 533).

Spring box
Include a spring box to trap sediment and store water to meet peak demands. Protect the spring box from freezing by covering with soil or other suitable protective methods for the site.

Size the spring box to provide sufficient storage of both sediment and any required water storage. Ensure that the cross-sectional area of the top of the spring box is large enough to allow access for periodic cleaning. Use a minimum cross-sectional area of 1.5 square feet.

Construct the spring box of a durable material such as concrete, rock, plastic, galvanized steel, or use wood that is untreated and rot resistant. Include a tight-fitting cover to prevent surface runoff, animals, or trash from entering. Locate the outlet pipe a minimum of 6 inches above the floor of the spring box to allow for sediment collection.

Outlet
Design the spring development with the capacity to convey water for the intended use. If using a pipe, design the pipe according to NRCS CPS Livestock Pipeline (Code 516). Alternative outlet structures must meet NRCS CPS Structure for Water Control (Code 587).

Design facilities intended to provide access to water from the developed spring according to NRCS CPS Watering Facility (Code 614).

Spring flow management
Provide an overflow when flow from the spring exceeds the capacity of the collection system. Size the overflow to carry the maximum flow expected from the spring. Locate the overflow in an area that does not cause erosion, degrade water quality, or create wet conditions near the watering facility.

To minimize potential adverse impacts to wetlands, implement one or more of the following measures (listed in order of priority):

- If applicable, install a float valve on the tank or trough and leave all excess water in the spring.
- Direct overflow back as close to the source as possible to enhance existing wetlands.

- Establish new wetland habitat that provides similar wetland functions and values as those being lost.

Smooth and grade areas disturbed by construction of the spring development. Properly manage runoff from natural spring flow, collected water, and overflow.

Reestablish vegetation on disturbed areas after construction with native plant materials where possible. Where native vegetation is difficult to reestablish, follow NRCS CPS Critical Area Planting (Code 342).

Springs often contain rare flora and fauna. Development should minimize disturbance to these species. Follow NRCS policy regarding impact to threatened, endangered, or special concern species.

CONSIDERATIONS

Consider how other conservation practices applied within the spring recharge area may increase infiltration of precipitation or snowmelt to augment spring flows. Consider testing water quality before developing a spring.

Consider a shutoff valve on the spring outlet pipe for winter shutdown, flow control, and maintenance.

Brush removal, excavation, cleanout, and withdrawal of water are manipulations that may affect fish and wildlife habitat and wetland functions. Selective removal of undesirable brush and management for desirable native plants may reduce evapotranspiration losses and conserve biodiversity.

Prior to construction, identify and control any undesirable plant species that may be spread by seed or through other means.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for constructing the spring development. Describe the requirements for properly installing the practice to achieve the intended purpose.

As a minimum, the plans and specifications include—

- Location of the spring development.
- Materials used such as pipe diameter, pressure class, and collection system, including the intake, cutoff wall, spring box, outlet, overflow pipe, and any other pertinent components.
- Elevations and dimensions of pertinent components such as collection system, pipes, tanks, and troughs.

OPERATION AND MAINTENANCE

Provide and review an operation and maintenance plan with the landowner. As a minimum, include in the plan—

- Removing sediment buildup in the spring box.
- Removing obstructions or blockage of the outlet and overflow pipes.
- Protecting against flooding and winter freeze. Divert surface water away from the collection area and spring box.
- Repairing erosion from overflow pipes.
- Checking operation of valves.
- Repairing rodent damage.
- Repairing damages from vandalism and theft.

Immediately repair any problems discovered. When cleaning out sediment from the spring box, place all sediments in the uplands away from the spring and associated wetlands.

REFERENCES

Heath, R.C. 1983. Basic Ground-water Hydrology: Water Supply Paper 2220. U.S. Geological Survey, Reston, VA. https://doi.org/10.3133/wsp2220

Stevens, L.E. and V.J. Meretsky. 2008. Aridland Springs in North America—Ecology and Conservation. University of Arizona Press, Tucson, AZ. http://www.uapress.arizona.edu/Books/bid1963.htm.

USDA NRCS. 2012. National Engineering Handbook (Title 210), Part 650, Chapter 12, Section 650.1202, Springs and Seeps. https://directives.sc.egov.usda.gov/

USDA NRCS. 2010. National Engineering Handbook (Title 210), Part 631, Chapter 32, Section 631.3201, Spring Development. https://directives.sc.egov.usda.gov/