

**Natural Resources Conservation Service  
Conservation Practice Standard**

**SPRING DEVELOPMENT  
(No.)  
CODE 574**

**DEFINITION**

Improving springs and seeps by excavating, cleaning, capping, or providing collection and storage facilities.

**PURPOSE**

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- to improve the distribution of water or to increase the quantity and quality of water for livestock or wildlife.
- to obtain water for irrigation if water is available in a suitable quantity and quality.

**CONDITIONS WHERE PRACTICE APPLIES**

In areas where spring or seep development will provide a dependable supply of suitable water for the planned times of use, and where the intended purpose can be achieved by using this practice alone or combined with other conservation practices.

The need for and feasibility of protection from livestock, flooding, sediment, contaminants, and potential damage to wetlands and existing wildlife habitat shall be considered when determining the suitability of a site for development.

**CRITERIA**

**General**

Spring developments shall be planned, designed, and constructed in compliance with Federal, State and Local laws and regulations.

**Design**

Fracture and tubular springs. If water issues from rock fractures, the individual openings shall be cleaned and enlarged, as needed, to provide an increase in flow. The water from these individual openings shall be collected by means of tile or perforated pipeline or by a gravel-filled ditch. The collection works shall be constructed an adequate distance below the elevation of the openings to permit free discharge.

If water issues from a single opening, such as a solution channel in a soluble rock formation or a tunnel in lava, the opening shall be cleaned or enlarged as needed. A collection system usually is not required.

If a spring box or sump is used, it shall be installed at an elevation low enough that water yield is not restricted.

Perched or contact springs. Perched or contact springs occur when an impermeable layer lies beneath a water-bearing permeable layer. Collection trenches shall be used to intercept and divert flows from the water-bearing formation.

Artesian springs. Remove obstructions, clean or enlarge joints or fractures, or lower the outlet elevation as needed to provide adequate flows. Sumps or spring boxes shall be located as needed. Free outlet discharge or minimum restriction to the spring flow is required to protect and maintain yield.

Collection systems. If a collection trench is used, the trench shall be excavated so that it extends into the impervious layer. Minimum length of the trench shall be based on site conditions, preferably the entire length of the water-bearing formation.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

A cutoff wall shall be constructed along the downstream side of the trench if needed to insure that the flow enters the collection system. The cutoff wall may be constructed of plastic sheeting, well-tamped clay, masonry, concrete, or other impervious materials.

The collection system shall consist of subsurface drainage tubing or perforated pipe not less than 4-inch diameter, wood box drain, or other suitable manufactured system. Surrounding the collector with geotextile fabric or a sand-gravel filter is recommended. Cleanouts should also be considered in finer soils.

Crushed rock or gravel backfill, not less than 1 foot thick, may be used as a collection system if site conditions warrant, in lieu of other materials.

Sand, gravel, and crushed rock shall be composed of clean, hard particles.

Spring boxes. Spring boxes, if needed, shall be made of plastic, concrete, or other durable material, with a tight access cover and impervious floor. The floor may be omitted when the underlying material is stable and impervious.

The boxes shall have a minimum cross-sectional area of  $1\frac{1}{2}$  ft<sup>2</sup>, and the floor of the box shall be not less than 6 inches below the outlet of the collection system.

Outlets. The outlet pipe from a spring box shall be placed not less than 6 inches above the floor, to provide a sediment trap. The spring outlet pipe should be at the same elevation or lower than the collector pipe outlet to prevent reduced spring flow. The outlet pipe shall be installed to the box with a watertight connection.

The outlet pipe must have positive grade away from the spring box or collection system unless vent pipe(s) are added to prevent air locks. The outlet pipe shall have the following minimum size:

1.  $1\frac{1}{4}$  inch (3cm) diameter for line grades greater than 1.0 percent.

2.  $1\frac{1}{2}$  inch (4 cm) diameter for line grades greater than or equal to 0.5 percent but less than or equal to 1.0 percent.
3. 2 inch diameter for lines grades less than 0.5 percent.

Appurtenance protection. Measures shall be included in the design to protect appurtenances from damage by freezing, flooding, sedimentation, contamination, and livestock.

Wildlife habitat protection. Spring developments with potential to jeopardize wetlands, bogs, fens, or other unique ecological sites shall be designed with measures required to maintain the existing habitat, unless acceptable mitigation is provided. A functional assessment will be made at potential spring development areas to determine existing ecological functions and/or potential losses.

Operation and maintenance plans for ecologically sensitive sites will include specific valve installation and operation requirements to protect existing site habitat values.

Vegetative establishment. Establishing vegetation on disturbed areas shall be in accordance with NRCS Conservation Practice Standard Critical Area Planting, Code 342.

Native vegetation adapted to wet conditions should be considered as an alternative to introduced grasses on some wet sites.

## CONSIDERATIONS

- Effects on water quantity shall be considered.
- Negligible long-term water quality impacts should occur from spring developments.
- Important wildlife habitat, such as woody cover or wetlands, should be protected if possible when siting the spring development. The landowner/user must be advised if wetlands will be affected. USDA-NRCS wetland policy will apply.

- Consider excluding livestock from the spring collection area to prevent damage to either vegetation or the spring appurtenances.

#### **PLANS AND SPECIFICATIONS**

Plans and specifications for installing spring developments shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

#### **OPERATION AND MAINTENANCE**

The operation and maintenance plan shall include such items as winter freeze and

flooding protection, overflow and valve operations, spring box sediment removal, rodent damage repair, maintaining vegetative cover and stable outlet, and other site specific items as needed.

The operation and maintenance plan should encourage livestock exclusion from the spring development area, if not a requirement of the design.

#### **REFERENCE**

NRCS Conservation Practice Standard:

Critical Area Planting, Code 342