

NATURAL RESOURCES CONSERVATION SERVICE
MONTANA CONSERVATION PRACTICE STANDARD

DAM, DIVERSION (NUMBER OR FEET)

CODE 348

DEFINITION

A structure built to divert all or part of the water from a waterway or a stream.

PURPOSE

- To divert all or part of the water from a waterway in such a manner that it can be controlled and used beneficially such as irrigation or livestock supply, fire control, municipal or industrial uses, develop renewable energy systems, or recreational.
- To divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

CONDITIONS WHERE PRACTICE APPLIES

This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (Code 362), Floodwater Diversion (Code 400), Dam (Code 402), or Grade Stabilization Structure (Code 410) would be used.

This practice applies where:

- A diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources,
- Diversion of water from an unstable watercourse to a stable watercourse **which can safely handle additional flow** is desirable,
- The water supply available is adequate for the purpose for which it is to be diverted,
- Adverse environmental impacts resulting from the installation of the practice can be overcome.

CRITERIA

The installation and operation of this practice shall comply with all federal, state, **tribal** and local laws, rules, and regulations. **When the structure is installed in a designated flood plain, its impact on the 100-year flood level must be analyzed.**

Environmental impacts – The impact of a proposed dam on water quality, fish and wildlife habitat, forest, and visual resources shall be evaluated and the techniques and measures necessary to overcome the undesirable effects shall be identified and addressed.

Materials – All materials to be used in constructing the diversion dam and appurtenances shall have the strength, durability, and workability required to meet the installation and service conditions of the site.

Structural design – Appurtenant structures shall be designed to withstand all anticipated loads. **All non-earthen structures shall be designed in accordance with Structure for Water Control (Code 587).**

Outlet works – If part of the flow is to be diverted, **a head gate or control structure shall be installed to regulate the diverted flow.** The outlet works must provide for positive control of both maximum and minimum flow rates consistent with the purpose for which the diversion is made. The outlet works must provide for safe diversion of all expected flows, considering such hazards as the potential for erosion, cavitation, and reduction in flow capacity due to the buildup of debris and sediment.

Bypass works – The bypass works must be capable of passing all flows needed to satisfy downstream priorities and all flows in excess of diversion requirements, including expected flood flows. This may require a combination of orifices, weirs, and gates designed to meet the

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

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requirements of the site. The bypass works must provide for safe bypass of all expected flows, considering such hazards as the potential for erosion, cavitation, and reduction in flow capacity due to the buildup of debris. **Provisions shall be made for safe re-entry of bypassed flows. The structure and associated site shall pass all flows in a safe and stable manner up through the 50-year peak flow. The design shall consider tail-water effects on the structure, along with the downstream and upstream areas.**

Special-purpose works – If debris, bed load materials, or sediments are present under flow conditions subject to diversion, provision shall be made to bypass or remove materials that may be detrimental to the functioning of the outlet works, to other parts of the works, or to areas to which diversion is made. This may require the use of settling basins, debris traps, trash guards, or sluiceways, depending on site conditions.

Vegetation – Disturbed areas, not otherwise covered or protected, shall be vegetated as soon as practicable after construction. If soil or climatic conditions preclude the use of vegetation, and protection is needed, non-vegetative materials, such as mulches, gravel, and rock riprap may be used. As a minimum, seedbed preparation, seeding, fertilizing, and mulching shall comply with instructions in local technical guides such as **Critical Area Planting (Code 342)**. The vegetation shall be maintained and undesirable species controlled.

Renewable Energy – For detailed criteria where the purpose is to develop renewable energy systems refer to interim conservation practice standard Renewable Energy Production (Code 716).

CONSIDERATIONS

The effects of this practice on water quantity, water quality, and the environment should be considered during the planning process. Effects to be considered are:

- Effects on the water budget, on volume and rate of runoff, infiltration, evaporation, transpiration, deep percolation, and groundwater recharge,
- Effects of the use of diverted waters for irrigation,

- Effects on the original watercourse, on the newly constructed watercourse, and on the area where the water is being diverted to and from,
- Effects on erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances carried by runoff,
- Potential temperature changes in downstream waters resulting from differences in bank shading in different watercourses,
- Potential changes in the amount of soluble substances infiltrating and available for ground water recharge as well as the potential for salt pick-up,
- Potential for introducing new plant or animal species to either the upstream or downstream waters,
- Effects on the natural migration of fish.

The owner or their agent shall be responsible for securing all necessary permits and for performing all work in accordance with appropriate laws and regulations.

Permits: One or more State and/or Local permits will likely be required. Consult the web site: http://dnrc.mt.gov/permits/stream_permitting/guide.asp for a list of potential permits required.

PLANS AND SPECIFICATIONS

Plans and specifications for installing diversion dams shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. **As required by the landowner to control noxious weeds and undesired vegetation, all construction equipment used in the installation of this practice shall be pre-washed and cleaned prior to mobilization to construction site.**

OPERATION AND MAINTENANCE

Provisions shall be made for operation and maintenance requirements and, for larger more complex diversion dams, may include a formal plan. Typical maintenance may include the removal of accumulated trash and debris from the structure and the repair of gates, screens, and other appurtenances. **The vegetation shall be maintained and undesirable species controlled.**