

# Dam Safety- Fact Sheet

Montana Watercourse and Montana Department of Natural Resources and Conservation  
Water Resources Division



## Basic Dam Layout and Nomenclature

Fact Sheet: 1

**Abutment** - That part of the valley side against which the dam is constructed. An artificial abutment is sometimes constructed where there is no suitable natural abutment. Right and left abutments are those on respective sides of an observer when viewed looking downstream.

**Appurtenances**- Structures associated with dams such as spillways, gates, outlet works, ramps, docks, etc. that allow proper operation of dams

**Auxiliary Spillway**- A secondary spillway also called an emergency spillway, designed to operate only during exceptionally large floods.

**Boil**- Typically a circular feature created by the upward movement of soil particles by seepage flowing under a pressure slightly greater than the submerged unit weight of the soil through which seepage is occurring.

**Breach**- A break, gap, or opening in a dam that allows an uncontrolled release of impounded water.

**Dam Crest**- The top of the dam embankment.

**Embankment Dam** - Any dam constructed of excavated natural materials, usually earth or rock, placed with sloping sides.

**Freeboard** - The vertical distance between a stated water level and the top of a dam.

**Groin** - The area along the intersection of the upstream or downstream face of the dam with the abutment.

**Height of Dam**- The vertical distance as measured from the downstream toe of the dam at its lowest point to the elevation of the top of the dam.

**Intake** - Any structure in a reservoir, dam or river through which water can be drawn into an aqueduct.

**Riprap** - A layer of large uncoursed stones, broken rock or precast blocks placed in random fashion on the slope of an embankment dam, a reservoir shore, or the sides of a channel to prevent erosion by wave and ice action.

**Plunge Pool (Plunge Basin)** - A natural or artificial pool that dissipates energy of free-falling water from an outlet pipe or spillway. The basin is located at a safe distance downstream of the structure from which the water is being released.

**Normal Water Level (Normal Pool)** - The lowest level of a dam's fixed overflow spillway crest.

**Outlet** - An opening through which water can be freely discharged for a particular purpose from a reservoir.

**Scarp** - The nearly vertical, exposed earth surface remaining at the upper edge of a slide on an embankment slope.

**Spillway** - A structure over or through which flood flows are discharged. If the flow is controlled by gates, it is called a controlled spillway; if the elevation of the spillway crest is the only control, it is called an uncontrolled

spillway.

**Spillway Crest** – The overflow elevation or location intended to spill.

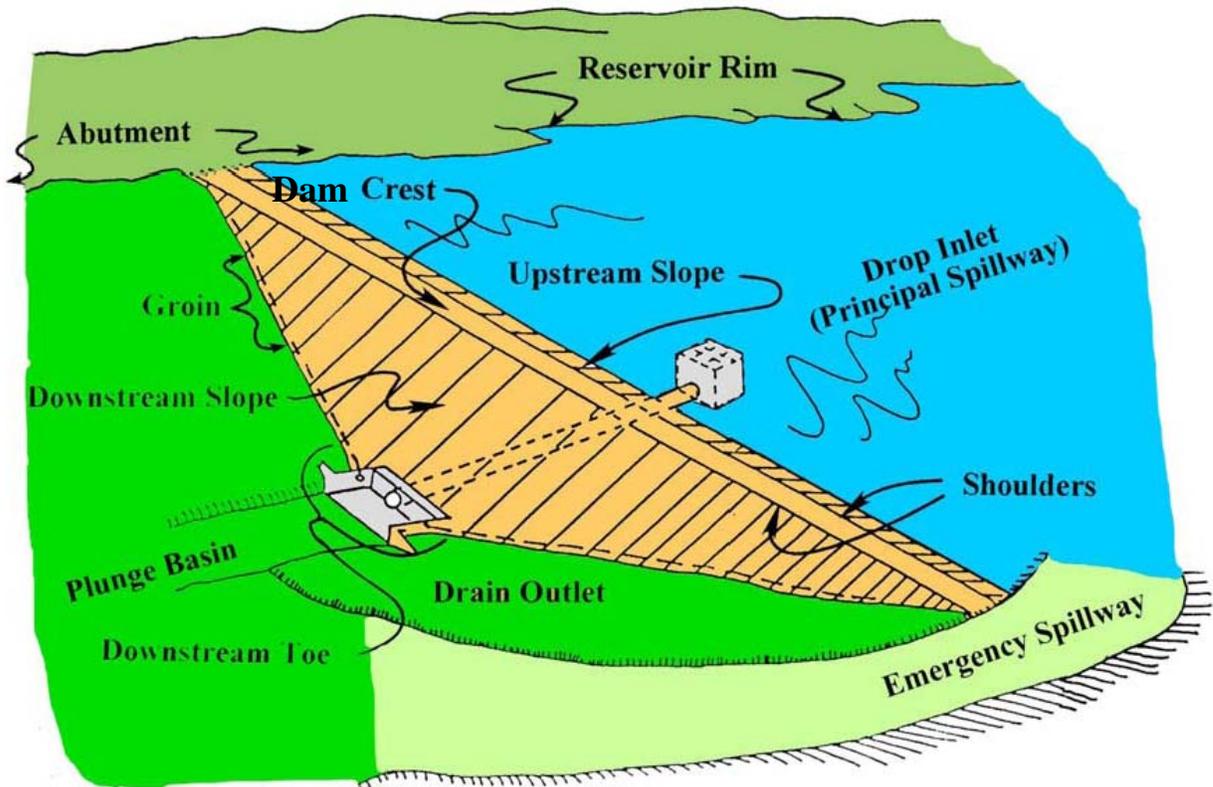
**Principal Spillway** - The principal or first used spillway during flood flows.

**Toe of Dam**- The junction of the face of a dam with the ground surface. An embankment dam has an “upstream” toe and a “downstream” toe.

**Seepage** - The movement of water through the dam, its foundations or its abutments.

**Stilling Basin**- A basin constructed to dissipate the energy of fast-flowing water, e.g., from a spillway or bottom outlet, and to protect the riverbed from erosion.

**Weir** - A structure built across a stream or channel to measure flow, sometimes called a measuring weir or gauging weir. A low dam or wall built across a stream to raise the upstream water level. Types of weirs include broadcrested, sharp-crested, ogee and V-notch weirs.



For more questions, comments, additional fact sheets, and area specific information you can contact DNRC or Montana Watercourse at the addresses below or on the web.

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