



**US Army Corps
of Engineers.**

USACE Dam Safety Facts for Clearwater Dam

Project location and description: Clearwater Dam was designed and built by the U.S. Army Corps of Engineers (USACE) and completed in 1948. USACE operates Clearwater Dam for flood damage reduction, recreation, and conservation of fish and wildlife.



The main components of the project are the earthen embankment, which serves as the water barrier; an intake tower, tunnel and outlet works that allows for normal water releases out of the reservoir; and an ungated spillway, which is a segment of the structure used to provide additional release of water from the reservoir during major flood events. The embankment dam section is 4,225 feet long, 154 feet above the original streambed, asphalt surfaced top (Highway HH) at elevation 609¹ feet. Foundation of the embankment is made up of rock and soil. Typical releases are made through 3 gates within the intake tower into the 23 feet diameter concrete lined tunnel which discharges into the stilling basin just downstream of the embankment. The spillway is located about 1,000 feet west of the embankment and consists of mostly of earthen materials to define the spillway, except for two concrete control structures placed about midway down the spillway. These concrete control structures are founded in bedrock and have a top elevation of 567¹ feet and width of 385 feet. Releases through the outlet works can pass up to 187,000 gallons per second (25,000 cubic feet per second) or about one quarter of an Olympic sized swimming pools each second. Should the reservoir go above elevation 567¹, spillway releases would initiate and it is designed to pass an additional 2,641,000 gallons per second (353,000 cubic feet per second) should the reservoir continue to rise to elevation 608¹ feet or an additional 4 Olympic sized swimming pools each second.

Benefits associated with Clearwater Dam: This dam has provided \$6.8 million in average annual flood damage reduction since placed into service. During the 2011 flood, the dam prevented \$6.8 million in flood damages. Annual recreational benefits to the area are about \$5.1 million.

Risks associated with dams in general: Dams reduce but do not eliminate the risk of economic and environmental damages and loss of life from flood events. When a flood exceeds the reservoir's storage capacity, large amounts of water may have to be released that could cause damaging flooding downstream. A fully-functioning dam could be overtopped when a rare, large flood occurs, or a dam could breach because of a deficiency, both of which pose risk of property damage and life loss. This means there will always be flood risk that has to be managed. To manage these risks, USACE has a routine program that inspects and monitors its dams regularly. USACE implements short- and long-term actions, on a prioritized basis, when unacceptable risks are found at any of its dams.

Risk associated with Clearwater Dam: Based upon the most recent risk assessment in 2012, USACE considers this dam to be a low risk dam among its more than 715 dams primarily due to the potential for spillway erosion, overwash of the dam, and erosion within the right abutment during extreme flood events or seepage under the concrete cutoff wall within the embankment.

¹ North Geodetic Vertical Datum 1929 (or NAVD29)

What residents should know: Dams do not eliminate all flood risk, so it is important that residents downstream from the dam are aware of the potential consequences should the dam breach, not perform as intended, or experience major spillway or outlet works flows.

Flooded area with rare flood event and breach is displayed on the map. Map Disclaimer: Actual areas flooded and flood arrival times will depend on specific flooding and failure conditions and may differ from the areas shown on the map.

The primary areas impacted should the dam breach with a full reservoir during a rare flood event or experience major spillway or outlet works flows are shown on the map. The potential for loss of life is highest within a couple of miles of the dam with the loss of life concerns decreasing substantially beyond 50 miles downstream of the dam. Advanced warning of problems and events plays a major role in protecting life and property. See the map for a general indication of flooding with a rare flood event and breach.

Public awareness: Dams are designed to pass large amounts of water on a regular basis, and this means there will always be flood risk that has to be managed (see facts below).

Recommendations for Residents	SWL Clearwater Dam Facts
<ul style="list-style-type: none"> • Living with flood risk-reduction infrastructure comes with risk – know your risk. • Living with flood risk-reduction infrastructure is a shared responsibility – know your role. • Know your risk, know your role, and take action to reduce your risk. • Listen to and follow instructions from local emergency management officials. • Strongly consider purchasing flood insurance. • Contact your elected local, county, and state officials to make sound flood risk management decisions in your area. 	<p>Estimated consequences with rare flood event and breach:</p> <ul style="list-style-type: none"> • Population at risk: ~20,800 • Structures at risk: 13,637 • Land and property at risk: \$1 billion <p>Estimated consequences with rare flood event and no breach:</p> <ul style="list-style-type: none"> • Population at risk: ~22,900 • Structures at risk: 8,630 • Land and Property at risk: \$450 million <p>Damages prevented: \$328.5 million (Thru 2016)</p> <p>National Inventory of Dams (NID) No.: MO30203</p>

Residents should listen to and follow instructions from local authorities. For more information, please contact the USACE SWL District office using the information on this fact sheet. You can also contact your local emergency management office.

For additional information about dam safety and living with dams, please visit <http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram.aspx> and http://www.damsafety.org/media/Documents/DownloadableDocuments/LivingWithDams_ASDSO2012.pdf