



USACE Dam Safety Facts for Melvern Dam

U.S. ARMY CORPS OF ENGINEERS

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Project Location and Description: Melvern Dam was designed and built by the U.S. Army Corps of Engineers, Kansas City District and completed in 1973. USACE operates Melvern Dam for flood control, water supply, recreation, and fish and wildlife.



The main components of the project are an earthen embankment section, which serves as the main water barrier composed of compacted earth; an uncontrolled spillway, a segment of the structure used to provide additional release of water from the dam during major flood events; and outlet works. The earthen dam is 9,650 feet long, 118 feet high, and top of the dam is 30 feet wide. The elevation of the top of the embankment is 1,078.5 feet ¹. The foundation is made up of rock and soil. The spillway is 200 feet wide with a crest elevation of 1,057.5 feet ¹. The spillway can pass up to 50,116 gallons per second (6,700 cubic feet per second) or approximately half the volume of an Olympic size swimming pool each second. The outlet works consist of two service slide gates, two emergency gates and two hydraulic slide gates. The outlet works maximum discharge capacity is 6,700 cubic feet per second.

During normal operations, the lake is kept at a relatively consistent level (referred to as conservation pool). Should heavy rains occur in the spring or at any other time, surface water runoff is stored in the lake until the swollen streams and rivers below the dam recede and can handle the release of stored water without damage to lives, property or the environment. Sometimes water must be released to protect the dam's integrity even though streams and rivers may have already reached or exceeded their capacity.

Benefits associated with Melvern Dam: This dam has provided \$8.2 million in annual flood damage reduction since placed into service. Melvern Lake Dam provides 50,000 acre-feet (ac-ft) ² of water to a number of communities downstream of the dam. The annual water supply benefits gained from Melvern Dam amount to nearly \$11.9 million. Annual recreational benefits to the area are \$2.5 million.

Risks associated with all dams: 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.

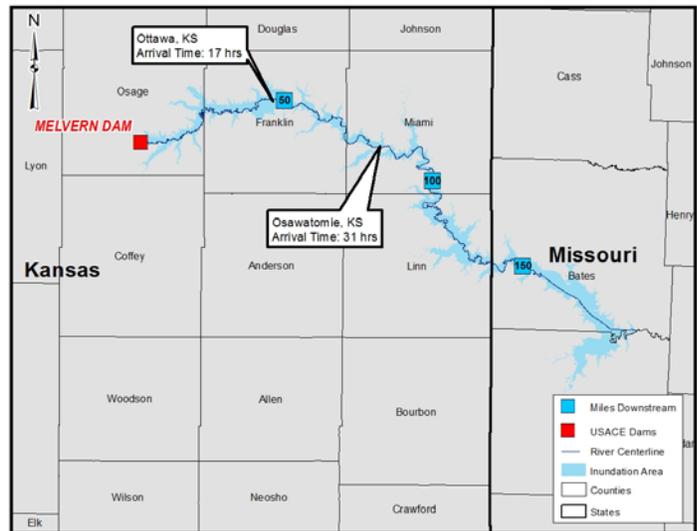
Risk associated with Melvern Lake Dam: Based upon the most recent risk assessment of Melvern Dam in 2009, USACE considers this dam to be a low risk dam among its more than 700 dams because of the risk associated with embankment and abutment seepage and piping.

¹ Mean Sea Level is the same as North American Vertical Datum 1988 (or NAVD88)

² One acre-foot is equal to 1/2 Olympic-size swimming pool

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/gated outlet flows. The high risk in Ottawa, KS; and the related consequences farther downstream warrant increased efforts on the part of USACE, local emergency management officials and residents to heighten awareness of the potential flood risk associated with the dam.

The primary areas impacted should the dam breach with a full reservoir during a rare flood event; or experience major spillway/outlet works flows are shown in 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 60 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.



Map inundation area displayed is the rare flood event and breach.
 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.

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	Melvern Lake 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 for 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: ~5,300 • Structures at risk: 2,705 • Land and property at risk: \$301 million <p>Estimated consequences with rare flood event and no breach:</p> <ul style="list-style-type: none"> • Population at risk: ~970 • Structures at risk: No data available • Land and property at risk: \$32.8 million <p>Damages prevented to date: \$335 million (1971-2010) National Inventory of Dams # KS00007</p>

Residents should listen to and follow instructions from local authorities. For more information, please contact USACE Kansas City district office at (816) 426-6320.

For additional information about dam safety and living with dams, please visit:
www.usace.army.mil/Missions/Civil-Works/Dam-SafetyProgram/
www.damsafety.org/