



USACE Dam Safety Facts for Blue Springs Dam

U.S. ARMY CORPS OF ENGINEERS

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Project Location and Description: Blue Springs Dam was designed and built by the U.S. Army Corps of Engineers, Kansas City District and completed in 1988. USACE operates Blue Springs Dam for flood control, recreation, and fish and wildlife. Its neighboring reservoir, Longview Lake, was constructed under the same project authorization and also includes a water quality purpose. Both reservoirs are effective toward the primary purpose of flood risk mitigation, where life safety is paramount.



The main components of the project are an earthen embankment, which serves as the main water barrier composed of compacted earth; an ungated outlet works for normal water releases; and an ungated overflow spillway section for releases during major flood events. The earthen dam is 2500 feet long and 70 feet high. The elevation of the top of the earthen embankment is 840.3 feet ¹. The foundation below the embankment generally has about 50 to 60 feet of clay overlying rock. The spillway is located on the left abutment (looking downstream) and is 300 feet wide with a crest elevation of 823.9 feet ¹. The spillway can pass up to 37,000 cubic feet per second (16 million gallons per minute). The outlet works is also ungated, but maximum discharges are about 570 cubic feet per second at lake elevation 823.9, which is much less than the spillway capacity.

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 Blue Springs Dam: Blue Springs Dam has provided \$3.9 million in annual flood risk management benefits since placed into service. Annual recreation benefits to the area are \$4.8 million.

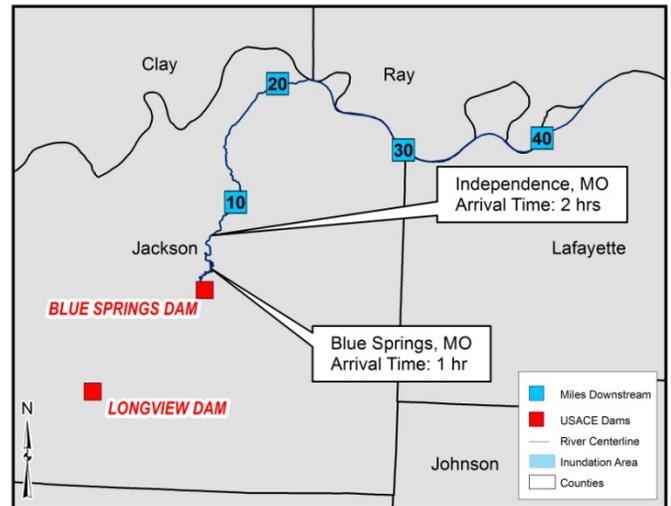
Risk associated with Blue Springs Dam: The watershed below Blue Springs Dam has seen significant commercial and residential development since the dam was constructed. Commercial development includes restaurants, gas stations, malls, assisted living, and a hospital. In May 1990, much of this new development area was inundated by local inflows apart from the presence of the upstream reservoirs that significantly reduced flood levels. The reservoir levels during this May 1990 event were still about 7 feet below spillway at Blue Springs and 8 feet below spillway at Longview.

Even more significant flooding would occur if a flood event exceeds the design flood storage at the Blue Springs and/or Longview dams. The spillways are estimated to begin discharges at a larger flood event, having about a 150 – 300 year return interval. The Little Blue river stages would rise dramatically if local inflows were supplemented by discharges from either or both reservoirs. The spillways are fixed crest, ungated, and required to prevent overtopping of the dams. However, it should be noted that unregulated river flows would be more damaging without the reservoir system. The most significant flood risk downstream of Blue Springs dam appears to be related to residual flooding in the watershed with the reservoir operating as designed.

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

Risk associated with dam safety: With any constructed facility, there remains some risk of failure or misoperation. USACE completed an assessment of Blue Springs dam in 2013, considering potential mechanisms that could result in a breach of the dam and uncontrolled release of the reservoir. The worst case scenario for downstream flood is a breach of the dam. The combination of consequences with probability of failure places Blue Springs dam in a low risk category among 700 dams operated by USACE. Routine dam safety and maintenance activities are planned. To manage risks, USACE has a routine program that inspects and monitors its dams regularly.

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 residential and commercial development in Blue Springs, MO warrant increased efforts on the part of USACE, local emergency management officials and residents to heighten awareness of flood risk management, including potential flood risk associated with the dam.



Map inundation area displayed is a 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.

The primary areas impacted should the dam breach with a rare flood event are Blue Springs, Independence, and Lexington in Missouri. The potential for loss of life is highest near the dam, with loss of life concerns continuing to the confluence with the Missouri River. Advanced warning of problems and events plays a major role in protecting life and property.

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	Blue Springs 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 a rare flood event and breach</p> <ul style="list-style-type: none"> • Population at risk: ~1500 • Structures at risk: 708 • Land and property at risk: \$89 million <p>Estimated consequences with a rare flood event and non-breach</p> <ul style="list-style-type: none"> • Population at risk: ~1100 • Structures at risk: No data available • Land and property at risk: \$51 million • Damages prevented to date: \$92.5 million (1988-2010) <p>National Inventory of Dams # MO12099</p>

Residents should listen to and follow instructions from local authorities. For more information, please contact the 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/