



Example of Flood Inundation Mapping

**Client:** Sho-Me Power

**Services Provided:**

- ✓ Detailed Hydrologic Study for PMF Estimation
- ✓ Detailed Hydraulic Study for Dam Breach Analysis
- ✓ Floodplain Mapping
- ✓ Coordination with FERC

## Project Objective

The Federal Energy Regulatory Commission (FERC) requires dam break analysis studies to estimate the potential hazards associated with a failure of a dam. This analysis can also be used as part of dam remediation process in the selection of alternatives.

The Sho-Me Power Tunnel Dam is located on Lake Niangua, approximately ten miles southwest of Camdenton in Camden County, Missouri. The dam reservoir varies from 10 to 20 feet in depth at the lower water stage. The surface area of the reservoir is approximately 360 acres, providing a capacity of 2650 acre-feet. The project objective involved the following elements: estimation of the dam breach parameters, estimation of the dam breach outflow hydrograph; routing of the dam breach hydrograph downstream; and estimation of downstream inundation extent and severity. This study determined the potential hazard to structures downstream of the dam due to an earthen embankment failure during a probable maximum flood (PMF), as well as during a sunny day failure, as required by the FERC.

## Geosyntec's Scope of Services

Geosyntec developed a hydrologic and hydraulic model for dam breach and flood wave inundation mapping downstream of the Tunnel Dam. A basin wide HEC-HMS was developed and calibrated for determining the PMF flow hydrograph. For developing the hydraulic model, Geosyntec directed the field survey reconnaissance plans. The field surveys and USGS topographic data were then used to setup a hydraulic HEC-RAS model for sunny day and Probable Maximum Flood conditions. The results of dam breach analyses were plotted on inundation maps of sufficient detail to understand the potential consequences associated with life loss and economics in case of dam failure. The results were submitted to FERC for review and to assist in the permitting process.

## Notable Accomplishments

- Established PMF for hydraulic analysis.
- Completed detailed hydrologic and hydraulic analysis, supporting documents, and GIS maps of floodway for existing and dam breach conditions.
- Performed unsteady state hydrologic and hydraulic analysis.
- Maintained close coordination with FERC, and prepared comprehensive analysis.