

**Sycamore Valley Lake ■ Dam Outlet Channel Improvements  
Augusta, Missouri**

*Prime Project Manager, Civil Engineering*

The scope involved a study and design to develop options to mitigate the ongoing erosion with an improvement that did not alter the dam, spillway, or its operation; or structurally connect to the dam or spillway. This entailed not raising the lake level for storms up to and including the 0.75 Probable Maximum Flood (PMF).

**Client:**

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The Sycamore Valley Lake and Dam was developed by Sycamore Valley Lake, LLC, and is located in Augusta, Missouri. The dam was constructed across a tributary to Femme Osage Creek, which generally drains to the east in the project area. The dam is about 66 feet high and 900 feet long. The dam's original design plans included a concrete weir and spillway that led to an 1100-foot long outlet channel, and outlet with a 50-foot long energy dissipater/sediment basin just before it discharged into the natural receiving stream, the tributary to Femme Osage Creek. The lake has a normal pool surface area of about 90 acres and watershed of about 1220 acres.

Millennia completed the Outlet Channel Improvement Options Study including preliminary hydraulics for the options in 2016. Based on the

study, Millennia recommended and the owner chose the design of the Drop Box, Cut-off Wall, and Low Flow Pipe option. Millennia designed the Drop Box, Cut-off Wall, Low Flow Pipe option (Phase I) and the Final Outlet Channel Improvements (Phase II). Phase II consisted of establishing an 80-foot wide rip rap channel downstream of the cut-off wall that would contain the 0.75 PMF. Phase II included the construction of two north 30-inch drainage culverts to assist with access and maintenance. After the Phase II plans and hydraulics were complete, the raising of the cut-off wall one foot was possible without impacting the lake level for storms up to and including the 0.75 PMF. A grate raise design raising the grate one foot was also completed and installed to assist with maintenance.

The Hydraulic Report was an analysis of the final improvement conditions as constructed.

