

TAUM SAUK PUMPED-STORAGE PROJECT,
FERC COMMISSION RE-LINCENSING PROJECT P-2277-023
Owned by Ameren Missouri
Located on the East Fork of the Black River (EFBR)
Reynolds County

Ameren Missouri operates the Taum Sauk Project to optimize the use of the water resources to produce electrical energy while balancing the environmental and recreational needs of the region. See the License Application (LA), Volume I of VII, Exhibit B, Project Operation and Resource Utilization (Appendix B).

Project Description:

The Taum Sauk Pumped-Storage Project is located in Reynolds County, Missouri, on the EFBR, approximately 90 miles southwest to St. Louis MO. The project was constructed in 1960 through 1963 by Union Electric Company, now doing business as Ameren Missouri. A complete description of the project can be found in the License Application for a new license, Exhibit A, filed June 2008 (Appendix A).

The Taum Sauk Pumped-Storage Project generally consists of:

1. A Lower Reservoir impounded by a concrete-gravity dam downstream of the confluence of the EFBR and Taum Sauk Creek;
2. An Upper Reservoir on top of Proffitt Mountain;
3. A vertical shaft; rock and concrete-lined tunnel section, and penstock conduit;
4. Pump-generated plan with two reversible pump units and two motor generators each with a nameplate rating of 204 megawatts (MW);
5. An excavated tailrace and open channel to the Lower Reservoir;
6. A 138 kV switchyard/substation;
7. A gravel and sedimentation trap (bin wall) on EFBR; and
8. Associated ancillary equipment.

Project Features:

Lower Reservoir and Dam: The project consists of a Lower Reservoir (LR) impoundment by a concrete gravity dam. The LR dam is an ogee-shaped concrete gravity spillway and has a span of approximately 390 feet. There are two sluices that pass through the dam with sluice gates for controlled water releases. The larger sluice is 8 X 10 feet and flow is controlled by a steel slide gate located on the upstream face of the dam. Gate movements are made via a motor operated actuator and the maximum flow capacity through this sluice is 2500 cfs. The smaller sluice passing through the dam is 20 inches in diameter at the upstream face and tapers down to 16 inches within the dam. A 20 inch cast-iron slide gate is located on the upstream face of the dam and is also operated via a motor operated actuator. The flow range of the 20 inch gate is up to approximately 50 cfs. Each gate is located in a concrete bay that is designed with a structure to hold stop logs and trash racks to minimize flow obstructions. The crest of the dam is at the 750 feet elevation and is designed to be over-topped during periods of high flow. The

dam impounds the Lower Reservoir which is a 395 acre reservoir at full level or 750 feet. The reservoir fluctuates during plant operation between the 736 foot and 749.5 foot elevations and has a working volume of 3,869 acre-feet within that range.

Upper Reservoir: The Upper Reservoir (UR) is located on top of Proffit Mountain within the Project boundary. The original dam experienced a breach failure in December 2005. Following this event the original dam was removed and a new dam was constructed from 2007 to 2009, with the plants return to operation in 2010. The new dam, which is built within the same general footprint of the original dam, is constructed from a combination of Roller Compacted Concrete (RCC) and convention concrete. This dam forms a 55 acre reservoir at full pool. The floor of the reservoir is at the 1505 foot elevation and the top of the dam is at an elevation of 1601 feet. For normal power generation, the operating range of the UR is from 1525 feet to 1597 feet and the total usable volume is approximately 4,360 acre-feet. The new dam is designed with an Emergency Overflow Relief Structure (EORS) on the southeast corner. The purpose of the EORS is to safely convey released water away from the toe of the dam without impacting the structural integrity of the dam. The height of the EORS is at the 1599 feet elevation and has a span approximately 809 feet long. The EORS would divert water to the Taum Sauk Creek valley in the unlikely event of a water release.

Tunnel and Penstock: The Upper Reservoir and Lower Reservoir are connected via a tunnel or penstock designed to transport water during pumping and generating cycles. An opening in the floor of the UR, in the shape of a “morning glory”, is approximately 27 feet in diameter. The tunnel drops vertically approximately 450 feet and then travels horizontally at a 5.7% grade approximately 6,572 feet to the power house. Portions of the penstock are concrete and steel lined. The total vertical elevation change is approximately 700 feet between the UR and LR.

Reversible Pump-Generated Units: The project’s pump-generating plant is located on the upstream end of the Lower Reservoir, about 2 miles from the Lower Reservoir dam. An excavated channel or tailrace, is cut through bedrock to transport water approximately 5,500 feet from the main body of the Lower Reservoir to the powerhouse. The powerhouse is constructed of concrete and contains two reversible pump units manufactured by American Hydro, each of which is connected to a motor generator with a nameplate rating of 204 megawatts. The generators are manufactured by General Electric.

Bin Wall and Sediment Trap: As part of the original construction of the Project, a bin wall was constructed across the East Fork of the Black River (EFBR) just upstream of the open channel tailrace. The bin wall serves as a sediment trap to prevent gravel from upstream of the Project from traveling into the Lower Reservoir and filling the tailrace or Lower Reservoir during high flows. Keeping sediment and gravel buildup from occurring in the excavated channel is an important design feature provided by the bin wall. The bin wall is constructed of two rows of sheet pile driven into the river bed with rock fill between the sheet pile rows. The bin wall travels across the river from bank to bank. The top of the bin wall is at the 748 feet elevation and is approximately 1.5 feet below the surface at normal maximum operating level in the Lower Reservoir. The bin wall is permeable and designed to allow passage of water

(leakage) into the Lower Reservoir during those times when the Lower Reservoir water level is below the top of the bin wall. From time to gravel in the area upstream of the bin wall is removed.

Primary Water Bodies: The Taum Sauk Project is located at the confluence of the East Fork of the Black River (EFBR) and the Taum Sauk Creek. The primary water source is the EFBR.

Water Management Plan: The Water Management Plan (WMP) was developed in cooperation with the Missouri Department of Natural Resources, Missouri Department of Conservation, and Ameren Missouri. The purpose of the WMP is to establish performance criteria for water releases for Taum Sauk Pumped-Storage Project for the term of the new operating license to be issued by the FERC. Aquatic life and other beneficial uses in the East Fork Black River (EFBR) downstream of the Taum Sauk Pumped-Storage Project are dependent on flows discharged from the Taum Sauk Lower Reservoir. The intent of the WMP is to provide for the needs of downstream aquatic life by matching the outfall from the Lower Reservoir with the naturally variable inflow to the greatest extent practicable while recognizing Ameren Missouri's right to reasonably beneficial use of the river for power generation.