# Fort Smith Regional Water Supply Project Update

Winter 2001

## Highlights:

- The primary purpose of the outlet works is to convey water from the lake to the treatment plant.
- The outlet works tower will be about 200 feet high.
- Southern lady's slipper orchids in the inundation zone will be transplanted to higher ground.
- Final Environmental Assessment published.

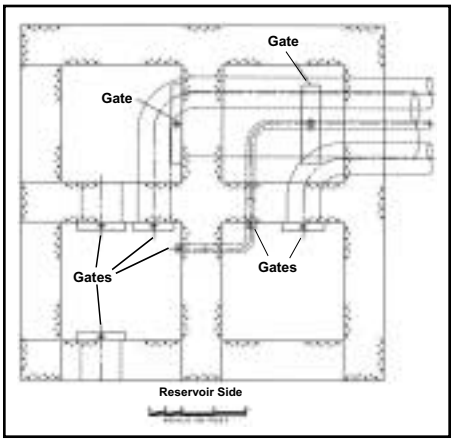
## Getting Water Out of the Lake 1: The Outlet Works

The primary purpose of the enlarged Lake Fort Smith is to provide additional water for the city of Fort Smith's regional water supply system. Removing water from the lake and delivering it to the water treatment plant is accomplished by the outlet works. In addition, the outlet works will provide storm water diversion during construction, the release of water to maintain minimum flow in Frog Bayou, and the controlled drawdown of the lake for dam maintenance if necessary.

The outlet works has two basic components: a tower and a tunnel. The tower will be about 45 feet square and 20 stories (200 feet) high. This concrete structure will be located in the lake near where the dam meets the east shore. Access to the tower will be provided by a bridge.

The tower consists of four vertical tubes, called wells, with holes in their sides. The walls of the wells will be up to 5 feet thick. Two wells will be devoted to withdrawing water for the treatment plant. The other two wells will be for maintaining water level in the lake at a safe elevation during construction. In the water supply wells, eight to ten openings will be located at various elevations up and down the tower so that water can be withdrawn from near the lake's surface, near the bottom, or somewhere in between, wherever the best water for treatment happens to be. Each opening will be approximately 5 feet in diameter. Flow through these openings will be regulated by gates. Each gate will consist of a 5-foot-square, cast iron plate that can be raised or lowered over the opening. The gates will be capable of being operated remotely from the treatment plant. The wells will also be internally connected with gated openings. This interconnection will allow for redundant operation so that gates and other equipment in the wells can be maintained and repaired without shutting down the entire outlet works. The outlet works will be able to deliver up to 70 million gallons of lake water per day to the Mountainburg Water Treatment Plant.

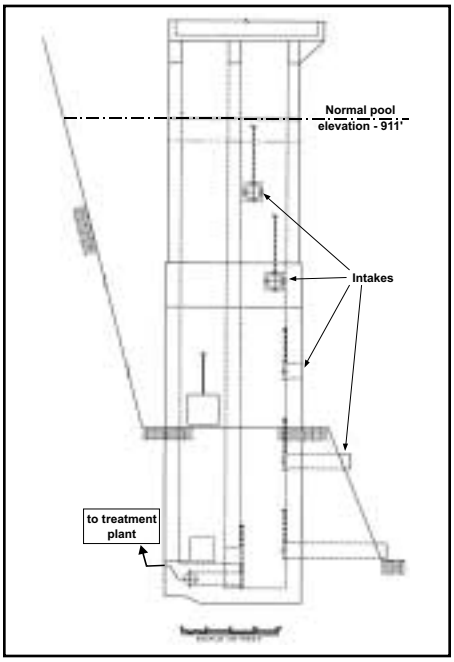
As is currently done at Lake Fort Smith, treatment of the water will actually begin at the outlet works. A chemical feed system at the top of the tower will inject potassium permanganate into the water that is sent to the treatment plant. This chemical oxidizes certain naturally occurring elements in the water so they can be removed at the treatment plant.




View looking down into the outlet works tower.

Water from the wells in the tower will be delivered to the treatment plant through two 48-inch diameter pipelines. These pipes will start at the base of the tower and run through a 1,000- to 1,200-foot long tunnel. In cross-section, this tunnel will be 12 feet wide, 10 feet tall, and shaped like an upside-down U.

Adjacent to the main water delivery pipes will be an 8-inch diameter pipe that will provide water to Frog Bayou when necessary to maintain the agreed-upon minimum flow. This pipe will run from the base of the outlet works, through the tunnel, into the water treatment plant's residual settling ponds, then into Frog Bayou. The agreement with the state also requires the water released into the stream to have a temperature similar to that of natural surface water. Under certain unusual conditions, water initially released from Lake Fort Smith to maintain minimum flow could be considerably colder than the water in Frog Bayou. The water, therefore, will be routed through the residuals settling ponds to allow its temperature to adjust to natural surface water temperature before being discharged into Frog Bayou. Water released to provide minimum flow in Frog Bayou will not contain potassium permanganate.




Vertical cross-section of the outlet tower.

## Saving the Southern Lady's Slippers

The construction of any large reservoir almost always seems to inundate at least one rare or protected plant or animal species. Although no federally listed threatened or endangered species will be impacted, the expansion of Lake Fort Smith will flood the locations of several populations of the rare southern lady's slipper orchid. Nationwide, 50 percent of known populations of this orchid have been eliminated because of logging, development, and collecting for horticultural and scientific purposes. This species is currently under consideration for listing under the Endangered Species Act. Although not required at this time by the act, the city of Fort Smith has committed to preserving the orchids that are in harm's way from the new lake. While in bloom this spring, the orchids in the inundation zone will be found and marked. In the fall, after the plants have become dormant,

Southern lady's slipper orchid.

the tubers will be transplanted to an area that will not be inundated by the expanded lake. The success of the transplanting will be evaluated in spring 2002.

## Final Environmental Assessment

The Final Environmental Assessment was published in February 2001. Over 50 copies were distributed to local, state, and federal agencies; Native American tribes; and interested individuals. Copies are available for inspection at the main branch of the Fort Smith Public Library, 61 S. 8th Street, and at the Mountainburg Library. After final comments are received and evaluated, the U.S. Army Corps of Engineers will continue to process the city's permit application.

The City of Fort Smith ARKANSAS

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