

**Cleveland County Water
Raw Water Supply Weir
Preliminary Project Description**



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1. Project Need

Cleveland County Water (CCW) owns and operates an 8.0 million gallon per day (MGD) Water Treatment Plant located on the First Broad River north of Lawndale, North Carolina. The Plant was originally constructed in the early 1980's and expanded several times as demand increased. In 1998 CCW constructed a new raw water intake and pump station downstream of the previous facility. The new facility is located at the confluence of the First Broad River and Knob Creek. This facility consists of two mechanically raked intake screens, one for each waterway, a concrete pumping station structure equipped with vertical turbine pumps and associated electrical and ancillary equipment. As part of the original construction, two low-head stone weirs were constructed across the First Broad River and Knob Creek. These weirs were sufficient to direct water through the intake channels to the wet well of the pumping station.

Given the geology of the region and the nature of these waterways, sand naturally accumulates behind the weirs and eventually inhibits the flow of water into the pumping station. CCW periodically excavates the sand that it can reach from the banks in order to maintain the flow of water to the pumping station. These sand removal activities are not sufficient for long-term maintenance and periodically CCW is forced to remove portions of the weirs and let the flow of water scour away accumulated sand and continue its natural migration downstream. These activities come at significant expense and disruption to the pumping operations and have become problematic. CCW therefore wishes to pursue the construction of a more permanent solution, consisting of low-head concrete weirs with a movable crest gate sufficient for periodic cleaning. These structures would replace the existing stone weirs in the First Broad River and Knob Creek.

2. Scope of Facilities

Over time the First Broad River has naturally migrated within its floodway, causing significant scouring and erosion on the banks. Much of this material is deposited behind the stone weirs. In recent years conditions have worsened and significant erosion now threatens the pumping station site as well as adjacent properties downstream.

CCW envisions a project which would both construct new weirs and restore the banks of the river on both sides upstream and downstream of the new facility. The new weir across the First Broad River would likely consist of a concrete structure approximately 150 feet long and 10 feet high. It would be equipped with a 20-25 foot long section of movable crest gate or similar mechanical means for opening and closing the waterway. The new weir across Knob Creek would be nearly identical but approximately 50 feet shorter.

A variety of bank stabilization methods are likewise available for restoring and stabilizing the banks. The full scope of that work has not yet been defined.

3. Preliminary Estimated Cost

Given the preliminary nature of the project it is difficult to accurately estimate its construction cost; therefore, a substantial contingency has been included. In general, it is envisioned that the project would consist of the following components and their associated costs.

Bank Stabilization and sitework	\$2,000,000
Weirs with movable crest gate	6,000,000
Contingency (30%)	<u>2,400,000</u>
Estimated Construction Cost	10,400,000
Technical Services	1,500,000
Permitting and Environmental	500,000
Administrative Costs	<u>200,000</u>
Total Estimated Project Cost	\$12,600,000

4. Photographs



First Broad River Intake and Raw Water Pump Station



Bank Erosion Upstream of Weir



Bank Erosion Downstream of Weir



Knob Creek Weir

Example of Similar Project

