

Stage 2 D/DBPR Compliance Through Implementation of Advanced Treatment

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The City of Danville is a growing community in Central Kentucky that provides potable water to approximately 70,000 customers within its city limits and in nearby areas. To meet these needs, Danville produces water at its Coldiron–Watkins WTP which is a conventional plant that was originally constructed in 1924 with subsequent process upgrades in 1952, 1957, 1966 and a minor project in 1990. The WTP performance has remained steady thanks to excellent operations but the ability to meet the Stage 2 Disinfectants/Disinfection By-Products (D/DBP) Rule is questionable. This concern is only amplified by the variable raw water quality that Danville receives from its primary raw water source (Lake Herrington) which is a deep lake with a modest surface area and prone to seasonal total organic carbon spikes, manganese events and lake turnover. The Danville intake withdraws water at two distinctly different levels in the lake which creates additional variables for treatment.

Acknowledging the challenges they face, Danville began performing investigations into possible advanced treatment options back in 2009. These investigations led them to consider seasonal changes in their coagulants to improve total organic carbon (TOC) removal as well as lake level draw strategies. Additionally, Danville began reviewing potential enhanced treatment approaches to gain an understanding of their benefits and drawbacks. In 2011 Danville retained HDR to follow up on these initial compliance activities and produce a comprehensive approach that would provide the City security that the Stage 2 D/DBP could be met.

HDR reviewed the work that had been performed to date and recommended a brief review of the available options as part of their overall approach. This review enabled HDR to review the benefits of multiple treatment processes and how they might fit in Danville. Several site visits were performed to gain an understanding of the process performance as well as operational requirements for the different options. In addition, HDR encouraged Danville to contract with Colorado University to perform a Rapid Scale Small Column Test (RSSCT) to gather information on the lifecycle costing associated with GAC replacement. Other bench testing was performed by Orica and Kruger for their *MIEX* and *Aciflo Carb* processes.

This presentation will outline the findings from this investigation and the direction that HDR recommended based on estimated capital costs, annual operational costs and other non-financial factors. The Danville WTP is expected to be expanded to a 15 MGD water plant as part of this activity.