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ChemScan® Application Summary #172 Dechlorination Control in Chlorinated Water

Statement of the Problem

Chlorine is the most widely used disinfectant today, however, the release of chlorinated water into sensitive waterways can be detrimental to aquatic life. Regulations have mandated that the chlorine be removed prior to discharge into a receiving waterway. Most dechlorination processes use a reducing agent such as sodium bisulfite to neutralize the chlorine in the water. A simple treatment process would add excess reducing agent to the stream to insure a complete removal of the chlorine. However, these reducing agents are themselves undesirable. The excess reducing agent will consume dissolved oxygen, potentially affecting the aquatic life. The ideal process would add just enough reducing agent to remove the chlorine.

Process Control Strategy

Dechlorination of chlorinated water requires the detection of chlorine residuals. One strategy is to feed a dechlorinating agent such as sodium bisulfite, sulfur dioxide or other similar compound based on the desired effluent chlorine residual. This is a feed-back type control using the effluent chlorine residual to control the dechlorinating agent feed pump.

Another control strategy is to feed dechlorinating agent use the chlorine residual prior to dechlorinating feed combined with a process flow rate. This is a feed-forward type control strategy. The effluent to the process can be monitored to assure complete removal.

Apparatus

ChemScan Process Analyzers are designed to detect both residual chlorine and residual dechlorination chemicals from one or more points in the treatment process, at concentrations as low as five hundredths of a part per million.

Chlorine is detected using a modified idiometric approach with multiple wavelength detection of the iodide to iodine conversion, while dechlorination agent is detected by measuring an applied disinfectant residual compared to a baseline. Unlike other analyzers, the ChemScan system compensates for reagent deterioration by measuring a baseline during every analysis cycle.