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Abstract Title: Implementation of Ozone for Microcystin Treatment at The City of Toledo's Collins Park Water Treatment Plant

Abstract: The City of Toledo (COT) has been operating the Collins Park Water Treatment Plant (WTP) for over 75 years and provides potable water to a population of approximately 500,000 . The Collins Park WTP is a 120 mgd conventional lime softening treatment plant. Improvements are being constructed to increase the total plant capacity to 160 mgd (140 mgd rated plant capacity plus 20 mgd redundant capacity).

The water supply for the plant is the western basin of Lake Erie, which is subject to seasonal harmful algae blooms (HABs) that can produce algal toxins. Of specific concern is the algal toxin microcystin, which has been observed to reach total levels at the WTP intake as high as 50 micrograms per liter ($\mu\text{g/L}$). Due to the recent trend of increasing incidents of harmful algal blooms and the associated presence of algal toxin in Lake Erie, coupled with recent regulations developed by the Ohio Environmental Protection Agency (OEPA), the COT are currently in the process of implementing ozone at the Collins Park WTP as an advanced treatment process for oxidation and removal of microcystin.

Ozone was selected as part of a multibarrier approach for the management of algal toxins. The intermediate ozone facilities will consist of three 1,200 ppd ozone generators (2 duty plus 1 standby) to meet the total future plant capacity of 160 mgd. This presentation will review the ozone system design with a focus on the implementation of ozone for the treatment of algal toxins and other considerations (scale-formation as a result of high calcium carbonate precipitation potential, tight hydraulic profile, permitting with the OEPA, and value engineering activities) that were addressed in the design of the Collins Park Ozone Facility.