

Control strategies for periodic T&O events – a perspective from the Great Lakes region

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Abstract

Algae blooms in the Great Lakes region of the United States and Canada are somewhat rare, but they do occur, and there is concern that their frequency and intensity may increase in the future due to climate change and population pressures. Drinking water treatment plants that use these water sources are therefore in a somewhat difficult situation in that the relative rarity of T&O events does not perhaps justify a large outlay of capital and operating expense, but on the other hand, even an occasional episode of objectionable water quality can erode public confidence.

In this presentation, the various strategies that drinking water treatment plants have adopted in this region will be discussed, with a focus on certain treatment tradeoffs that had to be made, as well as on several emerging treatment trends. Historically, plants have tended to opt for GAC-capped dual media filters, but this has led to some problems in filter effectiveness due to an inability to sufficiently backwash the filters given minimal freeboard in retrofitted installations. Some plants have installed ozone, but this is not necessarily an attractive option for periodic T&O events given the large capital expense. More recently, there is a growing interest in UV-based advanced oxidation strategies that can be operated in a disinfection mode most of the time, but at a higher UV dose and with the addition of a chemical (hydrogen peroxide or chlorine) when needed for T&O control. Control strategies and economic considerations related to this treatment will be reviewed. Finally, there is a very recent growing interest in biologically active filtration, with some preliminary evidence that this might be capable of controlling geosmin and MIB by biodegradation to an acceptable degree despite what would traditionally be considered to be unfavorable conditions for biologically active filtration, including short empty bed contact times and moderate temperatures.

It is hoped that lessons learned in the Great Lakes Region may be applicable to other parts of the world where algae blooms and related taste and odour events are an emerging problem.