

### INTRODUCTION

Blue Earth Products is the leader in innovative approaches to water quality standards. Our suite of products removes chlorine demand and sources of disinfection by-products in water distribution systems by eliminating biofouling and other organic laden deposits enabling utilities to easily sustain chlorine residuals system wide while reducing the formation of disinfection by-products (DBPs).

The Manchester NY Water District purchases wholesale water for use in its distribution system which varies seasonally and requires additional treatment. Additionally, distribution lines must be flushed to maintain safe chlorine residuals and disinfection byproduct (DBP) levels. Historically, the flushing volumes required have been excessive and expensive. To improve system performance, reduce flushing and reduce DBPs, Clearitas was introduced into the system in April 2017. Clearitas is an NSF 60 certified deposit control product that reduces the impact of biofilms on water quality resulting in a cleaner more efficient distribution system.

### RESULTS

Distribution data for the year of Clearitas treatment and the two years prior are presented in Figures 1 and 2. Figure 1 illustrates a departure from the normal trend of increasing TTHMs in late summer and fall after Clearitas was fed in 2017. Additionally, the TTHMs observed in the system normally track along with the incoming TTHMs.

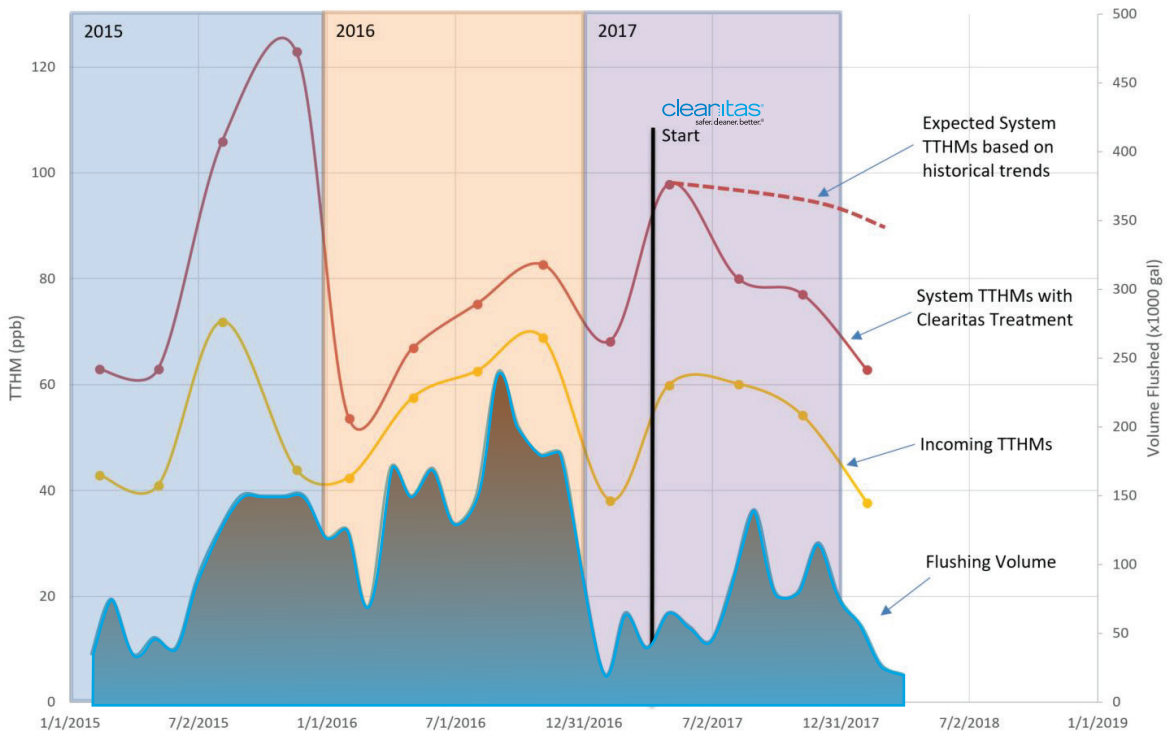


Figure 1 - Incoming vs. in system TTHM values and flushing volumes before and after Clearitas Treatment.

# CASE STUDY

EXTENDING CHLORINE RESIDUALS AND REDUCING  
DISINFECTION BY-PRODUCTS USING CLEARITAS®

clearitas®  
safer. cleaner. better.®

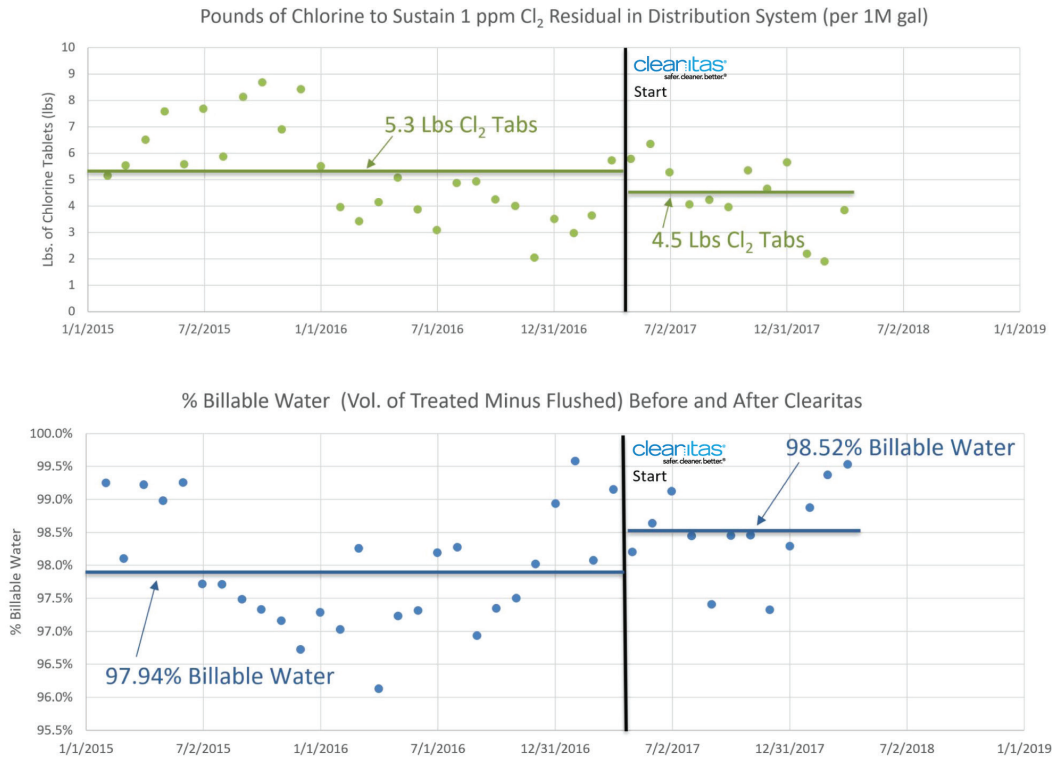


Figure 2 - Chlorine usage and % billable finished water before and after Clearitas treatment.

After Clearitas was fed for long enough to become active in the system the TTHMs dropped without being initiated by a drop in the incoming TTHM values. The HAA5 values were not plotted since they seem to have remained unchanged before and after Clearitas treatment and have not previously been in an upset condition.

Figure 1 also illustrates the effort (and expense) required to maintain the distribution system TTHM values through flushing efforts. After the TTHM upset in 2015, 2016 required a great deal more flushing to maintain control. After the Clearitas treatment became active in the system, significantly less flushing was required to maintain TTHM values below the limit of 80 ppb in 2017 and 2018. Ultimately this resulted in lower cost of treatment and a greater percentage of billable water (treated volume minus flushing volume) as seen in figure 2. After Clearitas treatment the average monthly billable volume increased by over a ½ percent (approx. 24,000 gal/month), illustrating one aspect of the financial benefit of reduced flushing.

## DISCUSSION

The data illustrates several benefits of Clearitas use 1) Reduction of water waste (flushing) while maintaining disinfectant byproducts below the legal limits, 2) Reduction of TTHMs below historical expectations, 3) Increase in the percent of billable water volume, and 4) Improved system cleanliness with expected reductions in chlorine usage moving forward. Overall, the use of Clearitas has resulted in a significant value to the Manchester City Water District.

DC# 1810, v.1