

*Utility:* Buffalo Sewer Authority

*Topic Area 5 - Optimize Asset Performance:* Real Time Control Of Inline Storage

*Team:* Buffalo Sewer Authority Staff, EmNet, GHD, Arcadis

*Dates:* Commissioned Winter of 2016

*Study Period:* March-May 2016 (Case Study prepared in October 2016)

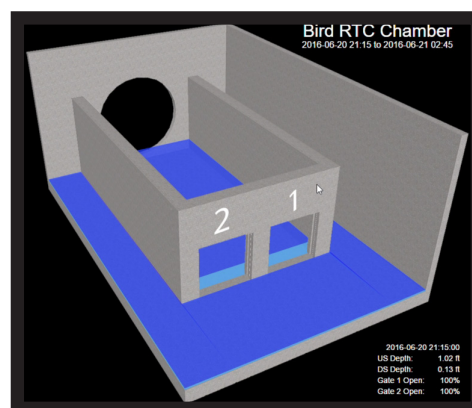
## ▶ BACKGROUND/DESCRIPTION OF CHALLENGE

Buffalo, NY, once the 8th largest city in the U.S., lost half of its population and most of its industrial base in the period since the 1960's. Before its decline, however, the City had built a massive sewer system to accommodate as many as 750,000 people, due to its previously high growth pace of population and industry. Today Buffalo Sewer Authority (BSA) serves a population of 250,000, and as such the collection system has substantial inline storage capacity.

## ▶ RESPONSE/SOLUTION IMPLEMENTED

Working with its team of engineers and consultants, BSA identified sixteen real time control (RTC) sites for inline storage and optimal conveyance throughout the city. The sites were selected for maximum return on investment. Four of the sixteen sites selected to be constructed first were chosen as a representative sample of all of the sites. Two of these four sites are now live, while the other two are in design. BSA plans to build and commission all 16 sites by 2020.

The initial return on investment of this citywide program is expected to reduce BSA's combined sewer overflow (CSO) volume by 15-20%, or over 350 million gallons. Based on the modeled outcome of the inline storage program using uniform rainfall of typical year simulations, BSA was able to negotiate \$145 million out of their long term control plan and administrative agreement with the U.S. Environmental Protection Agency and the New York State Department of Environmental Conservation. Based on the Team's experience, however, there are many anticipated additional operations and maintenance benefits to BSA, as well as significant potential for further reductions in overflow volume and activations. As the program develops and all sites are implemented, the system will benefit substantially from temporal and spatial distribution of rainfall across the urban watershed.



## ▶ OUTCOME/LESSONS LEARNED

The first two inline storage sites, commonly referred to as the Bird Avenue RTC (Bird) and the Lang Avenue RTC (Lang) sites, were commissioned in early 2016. Both sites are operated by programmable logic controllers (PLCs) within BSA's SCADA system, driven by remote level sensors upstream and downstream of each site. Both sites are presented digitally in the SCADA interface. From March 1 to May 31 the two sites were studied and tuned to achieve optimal performance. During this period, Lang reduced 4 out of 9 (44%) potential activations, resulting in reduced CSO volume of 1.2 million gallons (48%); while Bird reduced 14 out of 19 (74%) potential activations, resulting in reduced CSO volume of 12.1 million gallons (64%). It is important to note that the sites were tuned and performance was improved with each subsequent storm event during the study period.

### References/Links:

BSA Awarded EPA Environmental Quality Award

[www.emnet.net/clients/buffalo-new-york](http://www.emnet.net/clients/buffalo-new-york), [www.ghd.com/usa](http://www.ghd.com/usa), [www.arcadis.com](http://www.arcadis.com)