

Client
City of Boca Raton

Scope of Services
Professional engineering services for the development of alternatives for optimizing four-log virus treatment, preparation and submittal of the updated Demonstration to the FDHPBC for a re-rating of the clearwells at the membrane softening plant.

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Start Date
04/2020

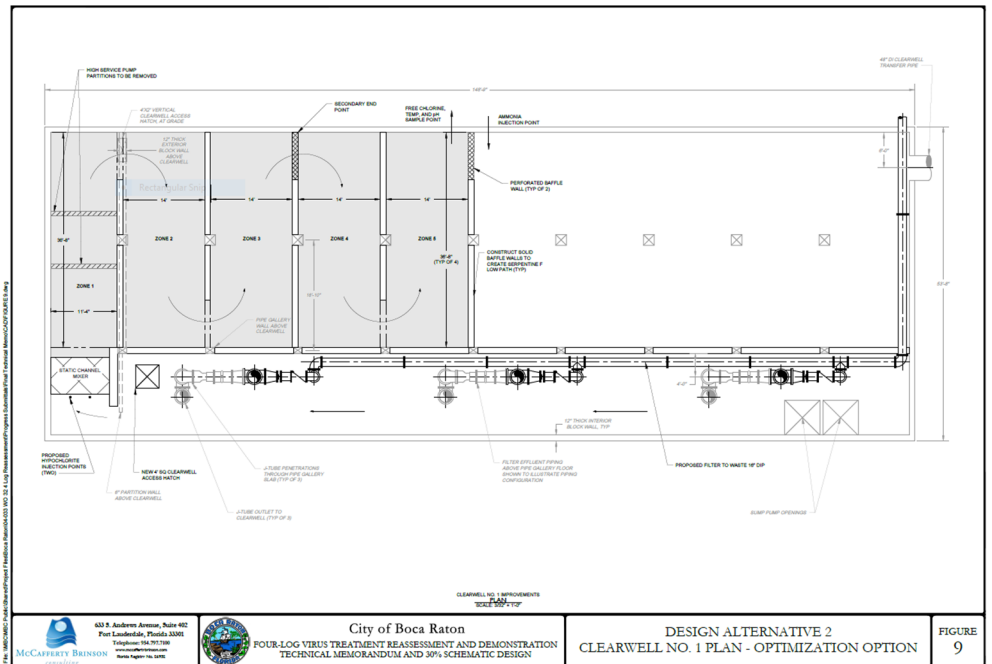
Completion Date
09/2020

Key MBC Staff
Frank A. Brinson, P.E.
Andrew Barba, P.E.

Key Features
Investigation and evaluation of alternatives to optimize the four-log treatment in accordance with the degree of improvement in the baffle factor, compliance with the regulatory criteria, construction cost and constructability, and the future accessibility within the clearwells.

Four-Log Virus Treatment Reassessment and Demonstration

Boca Raton, Florida



Background

In April 2013, MBC prepared and submitted a Demonstration of Four-Log Virus Treatment of Ground Water to the Florida Department of Health in Palm Beach County (FDHPBC) to obtain Four-log virus removal credits for the Glades Road Water Treatment Plant. Pursuant to that submittal, the FDHPBC issued the approved four-log virus treatment certification for the Glades Road Water Treatment Plant on October 15, 2013, and the City has operated under that certification since that date. Since demonstration approval in 2013, the City has determined that additional improvements can be implemented to optimize the disinfection processes to mitigate the formation potential of disinfection by-products (DBPs).

The City authorized MBC to investigate and develop alternatives for modifying the clearwell structures for the lime softening process stream to optimize the four-log disinfection processes to mitigate the formation of DBPs. These modifications will enable plant operating staff to more precisely control the application of disinfection chemicals to minimize the required contact time for disinfection and therefore better control DBP formation potential. Proposed modifications include the installation of channel mixers and intra-basin baffling, the relocation of chemical application points

and four-log treatment compliance monitoring points, and the re-rating of allowable flow treated through Clearwell No. 2 from 20 million gallons per day (mgd) to 25 mgd. The City submitted an updated Demonstration of Four-Log Virus Treatment of Ground Water to the FDHPBC to reflect the new approach for four-log virus treatment of the lime softening process stream to obtain an updated four-log certification for the water treatment plant. The conceptual design of this approach was approved by the FDHPBC in July 2020, and an updated four-log certification will be issued following implementation of the proposed modifications.

In the original April 2013 demonstration submittal, the flow through the nanofiltration (NF) process permeate Clearwell No. 3 was limited to 30 mgd, instead of NF process design capacity 40 mgd. At the time the demonstration submittal was prepared, the City elected to limit the Clearwell No. 3 flow because the 30 mgd limitation was sufficient to meet system demands. The City submitted an updated Demonstration of Four-Log Virus Treatment of Ground Water to the FDHPBC to re-rate this clearwell which was approved by the FDHPBC in December 2020.

The Project

MBC was authorized to provide professional engineering services for the development of design alternatives for optimizing four-log virus treatment in the lime softening treatment plant, preparation and submittal of the updated Demonstration to the FDHPBC for a re-rating of the City's lime softening and membrane softening process clearwells.

MBC's scope of services for the project included the following:

- Reassessment Study and Technical Memorandum. The objective of the technical memorandum was to present design alternatives for baffling in Clearwells No. 1 and 2 [MBC provided 3 alternatives] as well as MBC's recommendation for the best alternative for each clearwell and options for future optimization.
- Updated Demonstration of Four-Log Virus Treatment of Ground Water. The Demonstration document was submitted to the FDHPBC for conceptual approval. In July 2020 the City received a letter from the Health Department concurring with the approach for approval pending the described modification to Clearwells No. 1 and 2, inspection, and final review of the Four-log Submittal.
- Re-rating of Clearwell No. 3 Flow. The FDHPBC has approved the re-rating and issued an updated Determination of Four-Log Virus Treatment in December 2020.

MBC completed the design of this project in the end of 2020.