

Field Trip # 1: To Greater Cincinnati Water Works – Miller Treatment Plant

Host: Ms. Deborah Metz, Treatment Superintendent of Water Quality and Treatment Division, and Ms. Katherine Jamriska, Chemist/Laboratory Manager, Greater Cincinnati Water Works

Date: June 30, 2011

Time: 2:00-5:00 PM

Venue: Greater Cincinnati Water Works, 5651 Kellogg Avenue, Cincinnati, Ohio 45230

Prepared by:

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Ms. Deborah Metz and Ms. Katherine Jamriska from Greater Cincinnati Water Works hosted this field trip for the RET participants. Ms. Deborah Metz is a graduate of Xavier University where she obtained her Bachelors of Science degree in Biology/Natural Science in 1980. In 1995, she acquired her Masters in Environmental Science at University of Cincinnati College of Civil and Environmental Engineering. In 2001, she received her Masters of Business Administration from Xavier University. She is currently pursuing her Ph.D. in Environmental Science from the University of Cincinnati College of Civil and Environmental Engineering. She has been with the Greater Cincinnati Water Works since 1975. In her role as Superintendent of Water Quality and Treatment she is responsible for the management of the Water Quality and Treatment (WQT) Division including Treatment and Water Quality Distribution Sections

Ms. Katherine Jamriska is a graduate of St. Norbert College where she obtained her Bachelors of Science degree in Chemistry in 2003. In 2005, she acquired her Masters in Organic Chemistry at Ball State University. She is currently enrolled at the University of Cincinnati in their MBA program. She has been with the Greater Cincinnati Water Works since 2005. Her responsibilities include: sampling, analysis, reporting of water quality data, treatment process quality control, supervision of three laboratory technicians, OEPA compliance sampling and reporting, full scale treatment process improvements, and public education events.

This field trip was the first field trip for the RET summer 2011 program. Greater Cincinnati Water Works (GCWW) has been a municipally owned and operated utility since it was purchased by the City of Cincinnati in 1839. The GCWW supplies more than 48 billion gallons of water a year to 1.1 million people. Additionally, the GCWW operates and maintains 2 treatment plants, 24 pump stations, 33

water storage tanks and 3,100 miles of water mains. GCWW's service area has grown to include the entire City of Cincinnati, most of Hamilton County, and parts of Butler and Warren Counties in Ohio. In 2003, GCWW started selling water to Boone County and Florence, Kentucky via a pipeline installed under the Ohio River. The mission of the GCWW is to provide their customers with a plentiful supply of the highest quality water and outstanding services in a financially responsible manner.

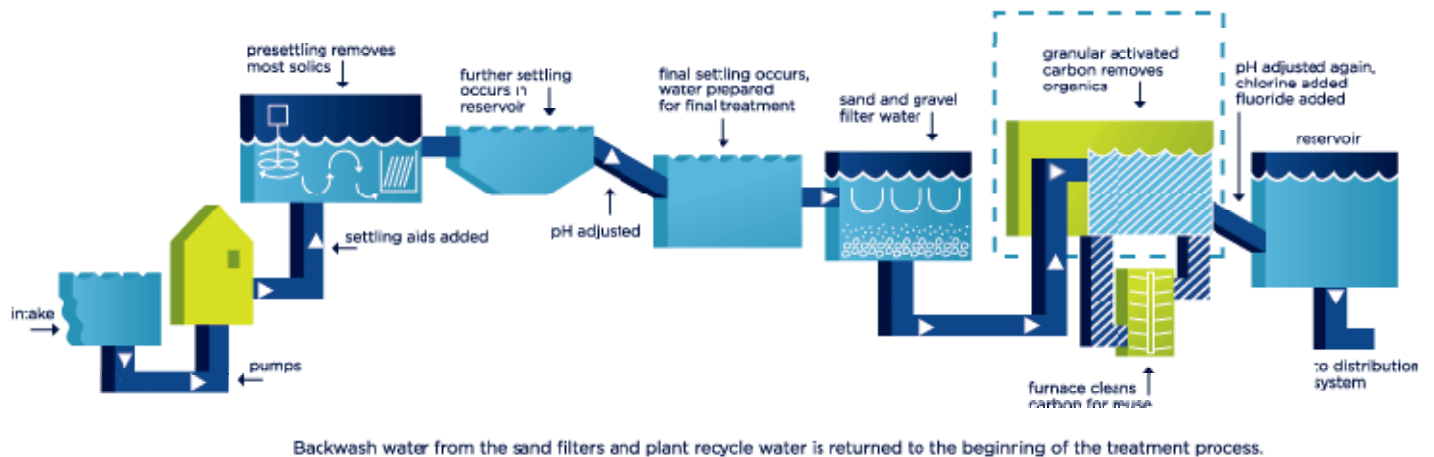
Upon arriving to the GCWW, the participants were greeted by Ms. Metz and were led to the GCWW museum. Here they were given time to browse and ask questions, looking at the different artifacts and displays as well as the flow chart of the treatment process in use at the Miller Plant. Next, Ms. Metz led the group into the conference room where she shared the history of the plant as well as the processes the facility conducts every day. Photographs taken in the conference room are shown below. No photographs were allowed to be taken beyond this point for security reasons.



Ms. Debra Metz Presenting



Participants in the GCWW Museum



The Treatment Process at the Miller Plant on the Ohio River

Visit to the Greater Cincinnati Water Works – Miller Treatment Plant

In 1992, the GCWW's Miller Treatment Plant began to incorporate granular activated carbon (GAC) with on-site reactivation into its water treatment process. This technology uses granular carbon which contains numerous microscopic cavities. When water is passed through the GAC, impurities adhere to the carbon and are removed from the water. Benefits of GAC are: barrier against potential chemical

spills in the Ohio River, impurities in raw source water, loess chlorine required for disinfection, reduced disinfection-by-products, and improved control of taste and odor.

At the conclusion of the presentation, Ms. Metz introduced the participants to Katherine Jamriska who acted as the tour guide of the facilities. The first stop was the building where filtering of the water takes place. Filtration is actually the 7th step of the water treatment process. There are 47 rapid sand filters that are used to remove particulate matter which includes solids and associated bacteria. Water which has been through pre-settling and flocculation flows by gravity down through the filters. Each filter is capable of filtering 5 million gallons of water per day at a rate of 2 – ½ gallons per minute per square foot of filter area. The filter tiles serve as a collection system for the filtered water during normal operation. They also serve as a distribution system for backwashing the filters to remove accumulated sediment and bacteria. The participants were able to see this backwashing first hand.

Next, the participants moved onto the 8th step of the water treatment process – and toured the GAC Adsorption. Here there are twelve deep bed contactors, each containing 600,000 pounds of granular activated carbon, which remove organic substances resulting in high quality finished water. After leaving the GAC area, participants were led to the control room. This is the room where all aspects of the GCWW are monitored via computer. Everything from the amount of electric being used to the amount of water in a tank can be controlled from this room!

Next up on the tour was the furnace area. This is part of the GAC onsite reactivation process and consists of the furnace that cleans the carbon for reuse. These furnaces can reach degrees as high as 1600° F.

GCWW is constructing an ultraviolet (UV) disinfection treatment facility at this plant. UV disinfection uses UV light, in low doses, to inactivate disease-causing organisms such as *Cryptosporidium*. Once completed, GCWW will be the largest water utility in North America to use UV disinfection following sand filtration and GAC adsorption to protect public health. The participants were shown where the research and testing of the UV pilot took place.

The tour was brought to an end with the participants visiting the various labs at the plant. They were led through the following labs:

- Extractable organics
- Volatile organics
- Metals (instrumentation)
- Microbiology lab
- General chemistry lab