Environmental Management Commission
Water Allocation Committee
Minutes

January 8, 2020
9:00 a.m.

On January 8, 2020 the Water Allocation Committee or WAC met in the Ground Floor Hearing Room at the Archdale Building in Raleigh, North Carolina**.**

WAC Members in Attendance:
John McAdams (WAC Chairman)
David Anderson (WAC Vice-Chair)
Mitch Gillespie
Pat Harris
Dr. Stan Meiburg (EMC Chairman)
JD Solomon
Dr. Donald van der Vaart

Others Present:
Marion Deerhake
Dr. Suzanne Lazorick
Philip Reynolds (Attorney General's office)

I. Preliminary Matters:

In accordance with North Carolina General Statute §138A-15, Chairman McAdams asked if any WAC member knew of a conflict of interest or the appearance of conflict with respect to items on the January 8, 2020 WAC agenda; none of the committee members identified a conflict. Chairman McAdams asked if there were any comments or corrections regarding the minutes from the November 13, 2019 meeting. There were no comments or corrections. Mr. Solomon made a motion to approve the November 13, 2019 meeting minutes. The motion was seconded by Ms. Harris and the November 13, 2019 minutes were unanimously approved.

II. Information Items:

A. The Town of Cary's Reclaimed Water Program (Donald Smith and Rick Jordan, Town of Cary)

Reclaimed water is highly treated wastewater and should not be confused with grey water (i.e., untreated wastewater from sources other than toilets). Cary's reclaimed water is treated with ultraviolet light and liquid chlorine but is not potable. Ideally, the demand for reclaimed water is year-round and near the source. The town's demand for reclaimed water for irrigation is less than was originally anticipated. Cary started its reclaimed

water program in 2001, the first in the state and still one of the state's largest reclaimed water programs. Cary partners with Durham County and Wake County RTP to provide reclaimed water.

There are several drivers for Cary providing reclaimed water: reducing the town's nutrient discharge, offsetting the peak demand on potable water for irrigation, and providing more water options for its customers especially during periods of water use restrictions for potable water. The town has a 60-mile distribution system for its reclaimed water program and serves approximately 800 customers, mostly from the residential sector.

The transmission pipes carrying reclaimed water are colored purple to reduce chances of being mistaken for potable water. The town conducts monthly compliance sampling to ensure the safety of the reclaimed water as well as an annual maintenance shutdown. The town has a robust education and outreach program; town staff meet with and train homeowners before they start receiving reclaimed water. Cary faces several operational challenges for its reclaimed water program, including: flushing distribution lines during periods of low demand, use in cooling towers which requires additional treatment, and the increasing complexity of system maintenance as the system size increases.

Is reclaimed water a waste or a resource? Administrative code NCAC 15.02U interprets reclaimed water as a "waste not discharged." This regulatory interpretation has a significant impact on how the water is handled and public perception. Reframing it as a resource could encourage more widespread use. Reclaimed water is more common in the western U.S., where it is seen as a resource. Given the regulatory interpretation, the town is required to report as a spill any overflow of reclaimed water from overwatering or leaks, and the response is handled as a sewer overflow. The town would like to see reclaimed water regulated as a "resource" rather than a "waste" to encourage use.

Questions and Discussion:
Mr. Solomon asked how much of the average year-round use is industrial versus residential? The presenters responded it is primarily residential, through Cary does have some industrial customers. Mr. Solomon then asked whether it is affordable for everyone to use reclaimed water? The presenters acknowledged that there is a significant cost to extend reclaimed water to new users and it is not a direct substitute for potable water for industrial users. Cary charges less for reclaimed water than for potable water, though that cost is subsidized by the town.

Dr. Meiburg asked about the three areas identified on a map on one of the presentation slides. The presenters acknowledged that those three areas represent the reclaimed water distribution areas and are in close proximity to the town's water treatment plants. Dr. Meiburg then asked whether most of the water is used for irrigation. The presenters answered yes, it is mostly for irrigation. Dr. Meiburg stated that in the western U.S. the concept of water is different in that all forms are seen as a resource. He asked whether there might be an impact on downstream flows and minimum flows due to increased

consumptive use of reclaimed water, and if that could be a concern in the future? The presenters agreed that it might become a concern.

Mr. Gillespie asked if the presenters from Cary could provide the WAC with a list of innovative uses for reclaimed water out West and regulatory areas that are serving as impediments in North Carolina to the more widespread use of reclaimed water.

Dr. van der Vaart asked where else in North Carolina reclaimed water is being used? The presenters stated it is being used in Holly Springs, Wilson, Raleigh has some industrial customers, and Alexandria, VA uses reclaimed water in the cooling towers for data centers.

B. Water Reuse as Part of Orange Water and Sewer Authority's Water Management Strategy (Ed Kerwin, OWASA)

Water reuse is an essential part of OWASA's "One-Water" management strategy. Science-based regulations should support and encourage water reuse. Reclaimed water is a resource, not a waste. OWASA has two surface water reservoirs, one water treatment plant, and one wastewater treatment plant. OWASA processes approximately 3 MGD (million gallons per day) of reclaimed water. OWASA's reclaimed water facility has been operational since 2009. A dual disinfection process is implemented with ultraviolet light and chlorine residual treatment; water quality is continuously monitored. There are five miles of transmission lines for OWASA's reclaimed water, which is distributed to one large year-round user: The University of North Carolina.

During the drought of 2001/2002 OWASA's reservoirs were 70% empty and the system was looking at the possibility of running out of water. Because of that experience, water supply security was a key driver for OWASA developing its reclaimed water program. At the same time, OWASA was making improvements to its water treatment plant and UNC was undergoing construction projects that helped facilitate the installation of transmission lines for the reclaimed water. UNC paid upfront for the capital costs (~$11 million) associated with implementing the reclaimed water program. It is believed that UNC recovered their costs in about 10 years. The reclaimed water is used mostly in UNC chiller plants, which is more economical to use than potable. The water is also used for irrigation on UNC athletic fields.

OWASA hasn't allowed other connections to the reclaimed water lines; small and infrequent residential customers are not desirable for system efficiency and the additional maintenance that would be required. Reclaimed water represents about 10% of OWASA water sales. The peak use is about 2 MGD during the summer; reclaimed water has therefore helped reduce peak demand on potable water. With consistent year-round demand from the university, OWASA doesn't have to worry about flushing the distribution lines and problems with chlorine residuals, which lowers operation and maintenance costs.

Since the reclaimed water program started in 2009, OWASA's overall customer accounts for potable water have continued to grow, while overall sales in million gallons per day have decreased. This is attributed to reclaimed water use reducing the demand on potable water, customers using less water due to higher density development, more efficient indoor water fixtures, and water rates that encourage conservation. OWASA's reclaimed water program reduces the risk of raw water shortages; without reclaimed water, the system would face greater incidences of being under water use restrictions.

OWASA's reclaimed water is currently used for non-potable applications that include: irrigation, cooling, toilet flushing, and bulk fill. The system is looking at expanding the uses for reclaimed water. It is unlikely that direct potable reuse is in the near future; regulations based on good science are needed to ensure health and safety are protected.

Questions and Discussion:
Dr. van der Vaart asked whether North Carolina has the statutory authority but no regulations? Mr. Kerwin replied yes, that is his understanding. Dr. van der Vaart then encouraged Mr. Kerwin to consider petitioning for rule making. Mr. Kerwin responded that OWASA is currently not constrained by existing state regulations.

Mr. Solomon asked how economically viable water reuse is for North Carolina utilities? Mr. Kerwin responded that it is not very viable. It is hard to justify economically for residential use since the demand is not year-round. Reclaimed water makes sense in some situations with large year-round users or where water is scarce.

Mr. Gillespie questioned whether DEQ could identify which of the state's river basins might have more drought issues in the next 30 years and which utilities might need IBTs to meet their water demands. He went on to say that it would be nice if water reuse could be an option instead of IBT, and for the Division of Water Infrastructure to target grants for water reuse.

Ms. Deerhake expressed an interest in hearing more about the ultraviolet disinfection process for reclaimed water. Mr. Kerwin responded that Dr. Sobsey had looked at that question in greater detail and would likely cover that topic in his presentation.

C. Health-related Microbial Aspects of Water Reuse and Reclaimed Water Quality (Dr. Mark Sobsey, UNC-Chapel Hill, Department of Environmental Science and Engineering)

Wastewater has high concentrations of pathogens, viruses, and parasites which need to be removed and de-activated before the water is returned to the environment. Dr. Sobsey provided a list of microbes of concern, as well as radiological, inorganic, and organic chemicals that need to be addressed in wastewater. Microbes that can be transmitted by various routes of exposure (flies, ag fields, food supply, etc.) need to be contained and treated to eliminate health risks. Pathogens can vary in size and differ in survivability in the environment, resistance to water and waste treatment, and their health effects.

A brief and selective history of water reuse going back 100 years was presented, starting with state parks in the West using water for irrigation and toilet flushing and ending with Australia in the 1980s using reclaimed water in residential homes. The major use categories for reclaimed water were discussed, including: landscape irrigation, agricultural irrigation, non-potable urban uses (toilet flushing, fire protection, chiller water, etc.), groundwater recharge (aquifer storage and recovery, and seawater intrusion control), and potable water supply augmentation.

There is some risk of pathogen exposure associated with water reuse. The goal is to achieve a tolerable level of pathogen risk and effectively communicate that risk to consumers. For potable use, the risk can be dramatically reduced using the potable reuse treatment processes available. The treatment involves a series of physical, chemical and biological processes and incorporates increased storage time and dilution for additional microbial reductions. The World Health Organization has provided guidance for producing safe drinking water but there is a lot of variability in the performance of the treatment processes. There are many cities interested in water reuse, though more on the West Coast than in the East. Water reuse is becoming a more viable option both technically and economically.

How to determine microbial quality? Pathogens are hard to measure. Preferred data establish a relationship between potentially regulated indicators and pathogens of public health interest. There is a list of health-related microorganisms that are indicators and includes bacteria, viruses and parasites. Indicators are always in fecal waste, present in high concentrations, and easy to detect. Pathogens are more difficult to measure and may be present in low or varying concentrations. A key goal is to reduce risks from pathogens to tolerable levels. The World Health Organization has established guidelines for wastewater reuse in agriculture and potable reuse for drinking water. The International Standards Organization also has water reuse guidelines.

In the United States, there are no uniform national standards for water reuse. State regulations vary among states; California has the most stringent standards while North Carolina is less stringent. North Carolina has two different reclaimed water categories. For potable use, there is a requirement that reclaimed wastewater be blended with source water at a 1:3 ratio prior to conventional drinking water treatment. No systems in North Carolina have sought certification yet for "Type 2" reclaimed water. Type 2 reclaimed water has not been studied for microbial quality when blended with surface source waters and stored for five days. Therefore, there is a need for real-world data that documents microbial reduction from treatment and microbial risk associated with Type 2 reclaimed water. Longer-term studies at more North Carolina facilities producing Type 2 reclaimed water are recommended.

<u>Questions and Discussion:</u>
Mr. Solomon asked if testing for pathogens is getting better, faster, and cheaper? Dr. Sobsey responded that it is if molecular techniques are used. It is easier but you don't know if the organisms are infectious (false-positive results are possible). Proper interpretation of the results needs to be ensured; therefore, assessments should be based

on culturable organisms. Mr. Solomon also asked why dual disinfection is used? Dr. Sobsey answered that exposure to ultraviolet light is good at reducing bacteria and parasites but not good at reducing viruses. Therefore, to get everything, both treatments are needed (both UV light and chlorine treatment).

Mr. McAdams asked the presenters from Cary what the driving factor was behind Cary's reclaimed water program? The presenters answered the reduction in peak demand on potable water and concerns about nutrient discharge to the Neuse River.

III. Concluding Remarks:

Chairman McAdams stated that he is seeking input on informational topics for future WAC meetings. He asked committee members to offer their thoughts during the meeting or to send him their ideas via email.

Mr. Solomon said he would be interested in getting an update on using stormwater better. He is also interested in the practical quantification limits on groundwater and the differences in how surface water and groundwater are regulated.

Mr. Gillespie mentioned several topics about which he is interested in hearing an update. Those include the consolidated state water supply plan and basinwide plan; where ecological flow is used in practice by DEQ; status of the hydrologic model directed by legislation in 2010, whether it went out for public comment, and whether it has been changed in the past 9-10 years; and the relationship between the 38 IBT basins and 8-digit HUCs.

Chairman McAdams stated he would follow up with the commissioners regarding their ideas for potential informational topics and asked if there was anything else that needed to be discussed or business for the committee. There were no additional comments by the committee members. The meeting was adjourned.