Environmental Management Commission
Water Allocation Committee
Minutes
November 18, 2020
9:00 a.m.

On November 18, 2020 the Water Allocation Committee or WAC, met virtually on WebEX.

WAC Members in Attendance:
John McAdams (WAC Chairman)
Mitch Gillespie
Pat Harris
Dr. Stan Meiburg (EMC Chairman)
JD Solomon
Dr. Donald Van der Vaart

Others Present:
Yvonne Bailey
Donna Davis
Sarah Zambon (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 November 18, 2020 WAC agenda; none of the committee members identified a conflict because there were no action items.

Chairman McAdams asked if there were any comments or corrections regarding the minutes from the July 8, 2020 meeting. There were no corrections for the meeting minutes, however there was a comment about the extensive nature of the notes. Ms. Harris made a motion to approve the minutes; the motion was seconded by Dr. Van der Vaart. The committee unanimously approved the minutes from the previous July 8, 2020 meeting upon confirming a quorum was present for the vote. Chairman McAdams asked if anyone would like to add to the agenda. There were no additions.

II. Information Items

A. DEQ's Programs That Use 7Q10 (Linwood Peele, Presenter, DWR)

Mr. Peele provided an overview of 7Q10. 7Q10 is the lowest 7-day average flow that occurs (on average) once every 10 years. 7Q10 is one of the most commonly used low-flow statistics. There are various programs within DEQ that consider 7Q10:

- DEMLR: Minimum flow and use of 7Q10 for dams
- DWR: Flow design criteria for effluent limitations

- DWR: Surface water source documentation
- DWM: Additional requirement for commercial hazardous waste facilities
- DWR: Local water supply planning
- DWR: Determining stream flows

Ecological flow is intended to protect the aquatic ecosystem during periods of drought and prevent an increase in the frequency or duration of extreme low flows that are damaging to ecosystem health. There are five components of natural stream flow: magnitude (how high does the water flow?), frequency (how often does the flow change?), rate of change, duration, and timing. DEQ continues to use 7Q10 models as the basis to make decisions for planning. No policy changes are being proposed.

Mr. Peele also stated that in the future, USGS is proposing to update the low flow statistics which would allow cost sharing between NC and SC. This 4-year project is beginning in October 2021. This update would develop regression equations that would provide the basis for StreamStats. This update would also allow anyone to use a simple interface to estimate statistics anywhere in NC.

Questions and Discussion:
Dr. Van der Vaart inquired about the difference between 7Q10 being used to determine concentration and protecting ecological systems. Mr. Peele invited Mr. Toby Vinson (DEMLR) and Mr. Fred Tarver (DWR) to address this question with regard to Dam Safety rules. Mr. Vinson confirmed that Dam Safety Rules address minimum stream flows for small hydroelectric dams, but also to maintain aquatic habitat. Mr. Tarver pointed out that due to the diversity of dam sizes, smaller dams wouldn't have the capability to manipulate stream flow like larger dams.

Chairman McAdams inquired if low level of flow was occurring more often than if dams didn't exist? He also asked whether a dam permit requires that the 7Q10 be maintained and whether stream flow may vary below a dam? Mr. Vinson pointed out that if the flow is greater than 0.3 cfs, that will allow for the proper modeling required to determine the minimum release. The Dam Safety rules set out mean annual daily flow, but no minimum release is required if certain conditions exist. The minimum release may be set at the 7Q10 if the flow is greater than 0.3 cfs.

B. Fuquay-Varina Interbasin Transfer (IBT) Request (Harold Brady, Presenter, DWR)

Currently an IBT certificate has been requested for Fuquay-Varina to transfer up to 4 million gallons per day (mgd) from the Cape Fear River basin to the Neuse River basin. Mr. Brady showed a map to illustrate the location of Sanford's intake for its water treatment plant, as well as the location of the Terrible Creek wastewater treatment plant in Fuquay-Varina. The Town of Fuquay-Varina is proposing to purchase finished water from Sanford. The Town of Fuquay-Varina's current service area and distribution system are split between the Neuse and Cape

Fear River basins. Fuquay-Varina's wastewater treatment plant discharges to Terrible Creek, which is located in the Neuse River basin.

The Notice of Intent (NOI) to file for an IBT petition was submitted by Fuquay-Varina to the EMC in August. Three public meetings were held in October; all were held outside. The last two meetings in particular were well attended. The applicant will be receiving comments through November 20, 2020 which is 30 days following the last meeting, as required by statute. The next step in the application process involves the preparation of the environmental document. Fuquay-Varina will need to develop a purpose and need statement; currently, demand projections are an estimate. An impact analysis will be created using an OASIS hydrologic model. All of this information will be used to create a draft environmental impact statement (EIS) which will be reviewed by DEQ. Following DEQ review, the draft EIS will go to the State Clearinghouse for review and a public hearing will be held on the draft EIS.

Questions and Discussion:
Dr. Van der Vaart inquired about the alternatives that could be considered versus the transfer itself. Mr. Brady confirmed that any reasonable alternative would be considered and that the purpose and need will consider population and water demand projections 30 years from now.

Mr. Gillespie asked whether water will be discharged back to the Cape Fear River basin? Mr. Brady responded yes, Fuquay-Varina will continue discharging wastewater via Harnett County's system to the Cape Fear River basin. Mr. Gillespie inquired about the general feeling from the public meetings. Mr. Brady shared that the public meetings went well. In Chatham County and Cary, the participants included several utility directors inquiring about the impacts, primarily to the Neuse River basin. The Fayetteville public meeting included mostly citizens concerned about how a proposed transfer could impact flow in the Cape Fear River. Mr. Gillespie also inquired about how frequently the state offers alternative plans to IBTs and whether an IBT has been turned down based on the EIS. Mr. Brady could not recall a specific example of an IBT certificate being denied by the EMC. Mr. Brady reviewed the process for evaluating alternatives and stated that applicants and DEQ staff discuss alternatives early in the process.

Chairman McAdams asked whether an applicant has ever submitted a notice of intent (NOI) then not pursued an IBT certificate? Mr. Brady answered that he was not aware of that happening. There have been water systems that have met with DEQ staff to discuss their water supply needs and early on identified another option besides IBT.

Dr. Meiburg asked if Sanford was a willing seller and whether there is sufficient pipeline infrastructure for the proposed IBT project? Mr. Brady replied that yes, Sanford is a willing seller, and this proposed transfer would likely result in a Water Treatment Plant expansion and additional pipeline would be required to distribute the water from Sanford to Fuquay-Varina.

C. Water Harvesting: Overview, Research, and Design (Dr. Bill Hunt, Presenter, NCSU)

Rainwater harvesting is not a new technology. Roman infrastructure featured rainwater harvesting to assist with plumbing. The Romans captured rainwater and used this water to flush their toilets. As the result of a legislative action, Annette Lucas (DEMLR) developed specific protocols for all stormwater control measures, including rainwater harvesting. Rainwater harvesting components include: a collection system, pre-treatment system (to remove particulates), cistern/tank, overflow, and a distribution system for further use (i.e., irrigation, washing cars, or brining). Since potable water is replaced with rainwater, rainwater harvesting systems can partially pay for themselves. The cost savings will never fully pay for the tank, but within a 10-year window up to a 30% return on investment is likely. As a result of the drought of 2007, we saw an uptick in the use of rainwater harvesting.

But how well do these rainwater harvesting systems (RHS) work?

Dr. Hunt showed a slide of a Craven County Ag Center RHS which illustrated that the tank was frequently at 100% capacity. Dr. Hunt showed another slide of a system in Kinston Public Utility that was even more frequently at 100% capacity. The personnel never actually used the harvested rainwater because the water pressure from the tank was less than the potable water faucet, so it was underutilized. Another example was a system installed for a toilet at the Natural Science Museum's Prairie Ridge Ecostation. The RHS was used a lot, but it stayed at around 70% of capacity.

There was a residential RHS at Holden Beach, which collected water from a rooftop and routed it to an underground tank outfitted with a pump. This water was used to irrigate a household vegetable garden. Dr. Hunt examined the capacity graphs and realized there was a slow leak in the cistern. He realized this leak allowed for extra capacity in the tank to capture stormwater runoff. As it turns out, this slow leak was a common design feature for cisterns in New Zealand. Dr. Hunt started purposely designing a slow leak into the rainwater harvesting systems he was developing. As a result, the state of NC requires the installation of a hole into the cistern to allow for a slow leak to increase capacity of rainwater storage.

In order to receive full stormwater credit, a stormwater control measure (SCM) must capture 85% of the annual runoff volume, in which case the system can be considered a primary practice. If a SCM can't capture 85% of annual runoff, then a secondary practice, like a rain garden, must also be installed to further capture and treat the runoff. Cisterns are designed to release water in advance of a rain event to ensure sufficient capacity. The system is then able to collect storm runoff, while allowing for the slow release of the contents of the cistern in between storm events. NCSU has created a modeling tool called the Water Harvester to determine the appropriate size cistern needed for the surface area to be treated.

Questions and Discussion:
Chairman McAdams questioned whether the idea is that the cistern/tank is like a pond with a hole? Dr. Hunt clarified that a rainwater harvesting tank is like an enclosed pond. Dr. Van der Vaart provided an example for clarification. If there is a building that doesn't include any stormwater harvesting, the rainwater will flow off the roof straight to the sewer. However, with rainwater harvesting, you are attenuating the stormwater flow to allow the water to soak into the ground and diverting flow from the sewer. Dr. Van der Vaart also asked if homeowners could utilize this technique to offset their impervious surface coverage. Dr. Hunt agreed and included an example from a neighborhood in Wilmington that used several rain barrels to mitigate some fraction of impermeable surface coverage. He went on to suggest that if someone built a patio, they could offset their impact with a rain barrel.

D. Town of Kernersville Cistern Car Wash (Wendi Hartup, Presenter, Town of Kernersville)

The Town of Kernersville procured funding to create a cistern for a carwash that was originally built in 1994. In 2015, the Town of Kernersville installed a cistern to offset the potable water used by the town car wash. This project served as a model and educational tool for the community, offset potable water use, and removed nitrogen and phosphorus from rooftop runoff.

The cisterns captured 12,000 ft^2 of rooftop runoff. The monthly average captured 21,000 gallons of water. Two 6,000-gallon cisterns were installed for storing rainwater and three 3,000-gallon cisterns were installed for water reuse during wash. This allowed for an average of 15 washes per day totaling 1,740 gallons of water used daily. The overflow of the systems runs straight to the creek.

The car wash system totaled $188,176: $89,852 for the truck wash system, $71,664 for the water reclamation system, and $26,659 for the rainwater recovery system to catch rainwater from the rooftop. The biggest challenges have been preventative maintenance. Most energy is used for reactive maintenance. It's difficult to find companies to service the systems. Another challenge has been the low pressure of the pump, which makes it hard to use on the Town's heavy duty vehicles like the trash trucks. However, the Town did realize monetary savings, as well as other benefits from saving its potable water and removing nutrients from the captured rainwater.

III. Concluding Remarks (Chairman McAdams)
Chairman McAdams asked if there was anything else that needed to be discussed or if there were other comments. There were no additional comments by the committee members or staff. The meeting was adjourned.