THE CITY OF ASHEVILLE

Staff Report

Council Meeting Date: April 11, 2023

Subject: North Fork & Wm. DeBruhl Treatment Study and Plant Improvements

Staff Resource(s): David Melton, Director of Water Resources and Leslie Carreiro, Assistant Director of Water Resources

Action Requested: Adoption of a resolution authorizing the City Manager to execute a professional services agreement with CDM Smith for the North Fork & Wm. DeBruhl Treatment Study and Plant Improvements

Background:

- Climate change has produced unusual effects on the quality of raw water available at both the Burnett and Bee Tree Reservoirs.
- Changes in raw water quality can happen quickly during significant weather events.
- The NC Public Water Supply has encouraged all direct filter treatment plants to investigate improvements that would help meet EPA and State Department of Environmental Quality rules and regulations - See Attachment A
- North Fork and Wm. DeBruhl are both direct filtration water treatment plants.

Vendor Outreach Efforts:

- A qualifications based selection process was used.
- Three (3) consulting firms submitted Statements of Qualifications for the North Fork & Wm. DeBruhl Treatment Study and Plant Improvements (298-WTPTreatmentStudyFY23).
- After evaluation of the Statements of Qualification, review of references and past projects, CDM Smith was the firm selected due to their expertise in areas of water treatment plant construction and upgrades.

Council Goal(s):

- Improve Core Services

Committee(s):

- n/a

Pro(s):

- Study will provide guidance on further optimizing current techniques for the treatment process.
- Study will provide guidance documents to assist staff with real-time decision making when raw water quality is low.
- Study will investigate treatment alternatives and recommend two for further consideration and pilot-study.
- All data, recommendations, and guidance would assist the plants in achieving future State and EPA regulations.

Con(s):

- Without conducting this study the City / Water Resources risks having to temporarily close a treatment plant during significant low raw water quality.
- Limiting production due to significant low raw water quality may require unplanned mandatory water conservation measures for our customers.

Fiscal Impact:

- The cost of the study, estimated to be $447,695 which contains a $40,000 contingency, will primarily be funded via a grant awarded by NCDEQ-Division of Water Infrastructure (utilizing state ARPA funds).
- Grant funding totals $400,000, and the remaining $47,695 has been identified within the current Water Resources capital budget.

Suggested Motion:

- Motion to adopt a resolution authorizing the City Manager to execute a professional services - agreement with CDM Smith for the North Fork & Wm. DeBruhl Treatment Study and Plant Improvements.

Attachment(s):

- Attachment A (Conventional Treatment Letter)
- Resolution
- COA Treatment Study WTP Improvements Mar32023.pdf

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

April 14, 2022

David Melton, Director of Water Resources
City of Asheville
PO Box 7148
Asheville, NC 28822

Re: City of Asheville
Conventional Treatment Recommendation
North Fork and William DeBruhl Water Treatment Plants
Buncombe County, NC0111010

Dear Mr. Melton,

The purpose of this letter is to recommend the addition of settling basins at the North Fork Water Treatment Plant and at the William DeBruhl Water Treatment Plant to provide an additional treatment barrier for the protection of public health. The multi-barrier approach to water treatment provides a series of barriers, which include source water protection, water treatment, distribution system integrity, water quality monitoring, and public information, to protect consumers from the risk of contamination and waterborne disease outbreak. Sedimentation basins provide an additional barrier of protection by removing additional particulates prior to filtration.

Our records indicate that the City of Asheville has a total design capacity of 43.5 million gallons per day (MGD). The City operates the following two direct filtration plants: the North Fork Water Treatment Plant (WTP) rated at 31 MGD, and the William DeBruhl WTP rated at 5 MGD. Fluctuating turbidity, color, and manganese concentrations in the raw water reservoirs for these two WTPs justify the need for these plants to be upgraded to conventional water treatment plants by adding settling basins.

The North Carolina *Rules Governing Public Water Systems* 15A Subchapter 18C Section .0712 states that water treatment plants which use direct filtration may be approved to treat high quality source water. Raw water turbidity concentrations should not exceed 5 NTU and color should not exceed 15 CU for water systems using direct filtration, and fluctuations in turbidity and color should not exceed 5 percent per hour. During Tropical Storm Fred in August 2021, the William DeBruhl WTP was not operated for thirty-five days due to the inability to treat water with higher than normal turbidity using direct filtration. The average daily raw water turbidity concentration at the William DeBruhl WTP ranged from 5.18 to 22 NTU between August 17, 2021, and September 5, 2021, and the average daily raw water turbidity remained below 5 NTU after September 5, 2021. The William DeBruhl WTP was offline during the time that the average raw water turbidity was greater than 5 NTU. The color at the North Fork WTP ranged from 12 to 91 CU between August 25, 2021, and August 30, 2021, during which time the water treatment plant remained in operation.

The average daily raw water turbidity was 5.6 NTU on August 17, 2021, and the average daily raw water turbidity remained below 5 NTU after this date. The North Fork WTP is not able to be taken offline because it provides the majority of the water for the water system.

After the Tropical Storm Fred, I toured the watershed and was struck by the destruction as noted by entrenched banks, log jams, and washed out bridges. The dead Hemlock trees and the rainfall intensity and duration significantly increased raw water turbidity in the North Fork Reservoir and the Bee Tree Reservoir. The effects of Tropical Storm Fred show that direct filtration alone may not provide adequate treatment at both water treatment plants during high intensity and duration rainfall events, which are occurring more frequently in the watershed.

Water quality issues caused by manganese would also be improved by adding sedimentation basins at both water treatment plants. The water system has received 3,069 water quality complaints in the past five years, and many of these complaints are associated with discolored water caused by manganese. Solid manganese is removed during filtration, but dissolved manganese is not filtered. The dissolved manganese is oxidized into solid manganese when disinfection is added, which settles in distribution mains and causes discolored water. Distribution system flushing is a common response to discolored water caused by manganese. Distribution system flushing in 2019 caused a fish kill and a Notice of Violation (see attached) was issued by the North Carolina Department of Environmental Quality, Division of Water Resources, Water Quality Section. The addition of sedimentation basins would allow for the flocculation and sedimentation processes to provide additional manganese removal that cannot occur in a direct filtration plant.

The recommendation for the addition of sedimentation basins at the two direct filtration plants will be included in the sanitary survey findings and in the sanitary survey letter written to the water system, which will be completed in the near future. Conventional plants get more log removal credit for Contact Time (CT) calculations, so another benefit of conventional water treatment will be an additional 0.5 log credit for Giardia removal. I understand that the City is seeking American Rescue Plan Act (ARPA) funding and that providing this letter ahead of time may be helpful in pursuing this funding.

Sincerely,

Kimberly Barnett

Kimberly Barnett, PE
Regional Engineer
Public Water Supply Section
Asheville Regional Office

cc: Central Files
ARO file
Leslie Carreiro, Assistant Director of Water Resources, City of Asheville
Bill Hart, Water Production Division Manager, City of Asheville
Nicole Hairston, Environmental Specialist II, Public Water Supply Section
Daniel Boss, Water Quality Section

Attachment: Notice of Violation Bee Tree Fish Kill September 13, 2019

RESOLUTION NO. 23-____

RESOLUTION AUTHORIZING THE CITY MANAGER TO EXECUTE A CONTRACT WITH PROFESSIONAL SERVICES CONTRACT WITH CDM SMITH FOR THE NORTH FORK & WM. DEBRUHL TREATMENT STUDY AND PLANT IMPROVEMENTS

WHEREAS, pursuant to N.C.G.S. § 160A-312, the City of Asheville has authority to operate a public enterprise; and

WHEREAS, pursuant to N.C.G.S. § 160A-20.1, the City of Asheville may enter into contracts with private entities to carry out any public purpose the City is authorized to engage in; and

WHEREAS, CDM Smith was selected by Staff via a qualifications based process to provide professional services for the North Fork & Wm. DeBruhl Treatment Study and Plant Improvements; and

WHEREAS, professional Services Contract with CDM Smith for the North Fork & Wm. DeBruhl Treatment Study and Plant Improvements; and

WHEREAS, the use of, CDM Smith will utilize the most qualified firm to ensure timely completion and fulfill compliance with scope of services for the North Fork & Wm. DeBruhl Treatment Study and Plant Improvements;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ASHEVILLE THAT:

The City Manager, on behalf of the City of Asheville, is hereby authorized to execute the contract with CDM Smith for the North Fork & Wm. DeBruhl Treatment Study and Plant Improvements for data collection & review, water quality analysis, and recommendations for the amount of $407,695.00 with a reimbursement for $400,000.00 from the NC Department of Environmental Quality - Division of Water Infrastructure ARPA grant for a total project cost for the City of $47,695.

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Read, approved, and adopted this 11th day of April, 2023.

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City Clerk Mayor

Approved as to form:

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City Attorney