



Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

May 6, 2022

**Preliminary Finding of No Significant Impact
To All Interested Citizens, Organizations, and Government Agencies**

**Greene County Sanitary Engineering Department - Greene County
Northwest Regional WTP (NWRWTP) Expansion
Loan Number: FS390029-0019**

The attached Environmental Assessment (EA) is for a water treatment plant expansion and water softening improvement project in Greene County which the Ohio Environmental Protection Agency intends to finance through its Water Supply Revolving Loan Account (WSRLA) below-market interest rate revolving loan program. The EA describes the project, its costs, and expected environmental benefits. We would appreciate receiving any comments you may have on the project. Making available this EA and seeking your comments fulfills Ohio EPA's environmental review and public notice requirements for this loan program.

Ohio EPA analyzes environmental effects of proposed projects as part of its WSRLA program review and approval process. We have concluded that the proposed project should not result in significant adverse environmental impacts. More information can be obtained by contacting the person named at the end of the attached EA.

Any comments on our preliminary determination should be sent to me at the email address of the contact named at the end of the EA. We will not act on this project for 30 calendar days from the date of this notice. In the absence of substantive comments during this period, our preliminary decision will become final. After that, Greene County can then proceed with its application for the WSRLA loan.

Sincerely,

Steve Malone

for
Kathleen Courtright, Assistant Chief
Division of Environmental & Financial Assistance

Attachment

ENVIRONMENTAL ASSESSMENT

Project Identification

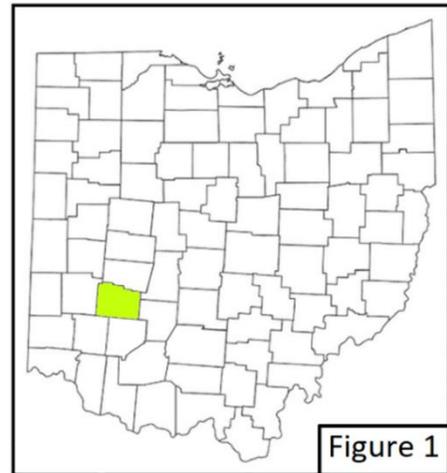
Project: Northwest Regional WTP (NWRWTP) Expansion

Applicant: Greene County Sanitary Engineering Department
35 Greene Street,
Xenia, OH 45385

Loan Number: FS390029-0019

Project Summary

Greene County Sanitary Engineering Department (GCSED, referred to as Greene County) has applied for an Ohio Water Supply Revolving Loan Account (WSRLA) loan for \$45,839,002 to improve the existing Northwest Regional water treatment plant (NWRWTP). Improvements include incorporating reverse osmosis membrane filtration treatment for softening and removal of constituents including per-and polyfluoroalkyl substances (PFAS), increasing the capacity of the water treatment plant (WTP) from 10.5 million gallons per day (MGD) to 12 MGD, and providing for a future capacity of 16 MGD. Additionally, Greene County plans to remove the aging South WTP from service.



In order to construct the new filtration facilities, approximately one acre of trees was removed in preparation for this project, during the seasonal tree clearing window.

Greene County has gradually built water rate increases into their customers' water bills over time and will not require a specific water rate increase to pay back WSRLA loan debt for this project.

History & Existing Conditions

Greene County, located in southwest Ohio (Figure 1), has a water distribution system that supplies water to approximately 17,000 customers within three major regions of their service area which includes the Northwest Regional, Eastern Regional, and Southwest Regional water systems (Figure 2). Until recently, the three regions operated independently from each other, with each having their own source water supply. Recent system improvements have resulted in a hydraulically combined Eastern Regional and Northwest Regional service area, with the completion of an interconnect project that came on-line in May of 2018. Since that time, the county has been supplying both Northwest and Eastern Regional service areas with water primarily from the Northwest Regional WTP (NWRWTP) along with supplemental supply from the South WTP (SWTP). Previously, the City of Xenia supplied the Eastern Regional area. In 2019, Greene County had a regional water master plan and hydraulic update report prepared to identify areas in need of improvement. The regional water

master plan identified need for source water capacity improvements and distribution improvements in addition to the NWRWTP expansion and softening upgrade and will be implementing these improvements over the next 20 years.

Greene County currently purchases finished water for a portion of its service area from three other water utilities – the City of Fairborn, the City of Dayton, and Montgomery County. Given that these areas currently receive softened water, it will be necessary to integrate softening into the existing water plant to provide a consistent finished water quality. The existing NWRWTP does not soften its water.

Raw water is supplied by groundwater from three well fields with a total of 14 production wells that withdraw water from the lower-level Little Miami Buried Valley Aquifer, a Sole Source Aquifer. The aquifer has an upper and a lower layer, separated by a solid clay layer. The North and Valley Springs well fields supply water to the North WTP, and the South Well Field supplies water to South WTP. The estimated total production capacity of the wells is 11.6 MGD. However, several of the wells are not producing or are poorly producing. Part of the master plan is to rehabilitate these wells to restore production, and to install a new well field. The modelling study indicated that future production capacity could be increased to 15.4 MGD after the improvements, to achieve the desired supply for the NWRWTP treatment capacity expansion.

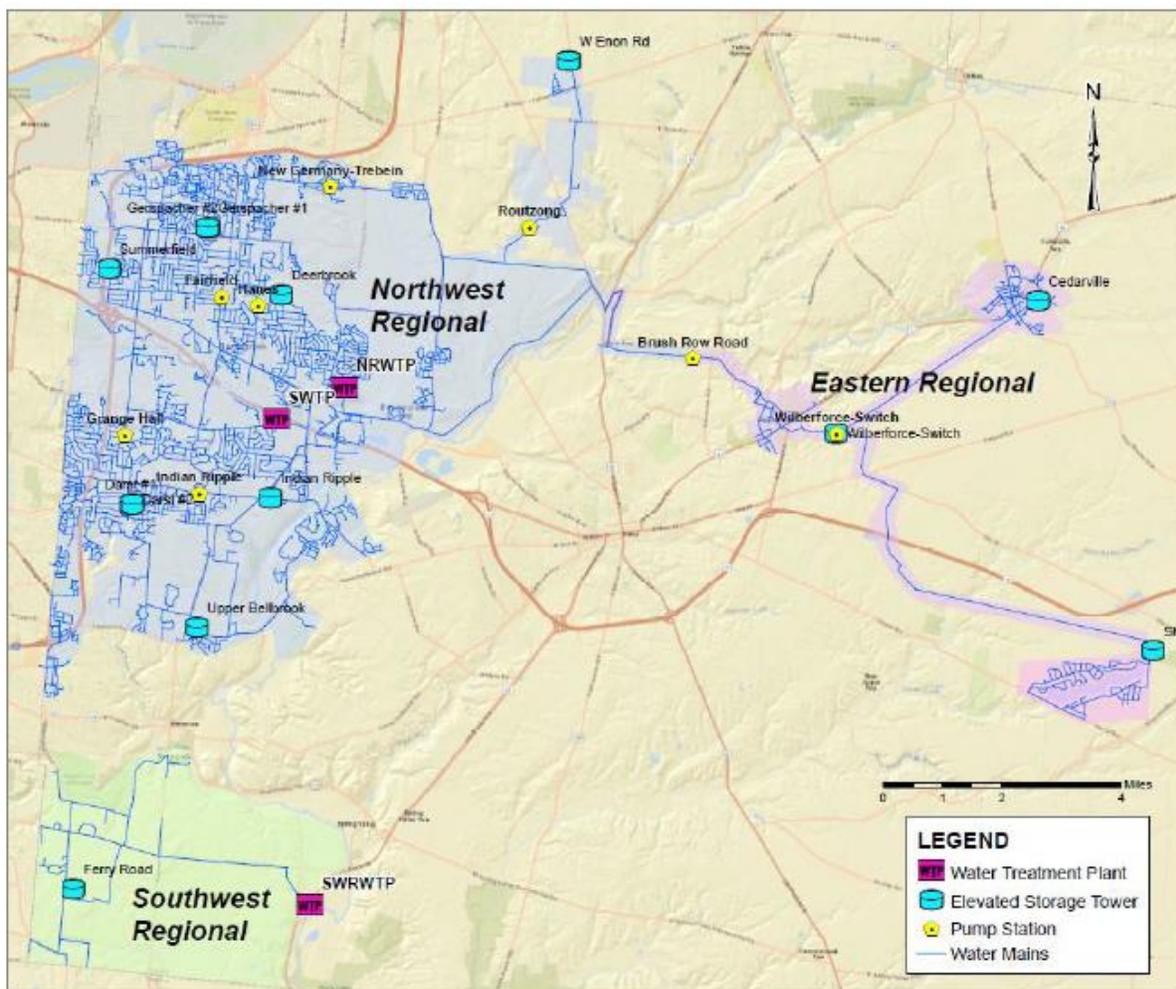


Figure 2. Map of water service areas in Greene County

The current NWRWTP treatment process consists of aeration and reaction for oxidation of dissolved iron and manganese; greensand filtration for removal of precipitated iron, manganese, and other suspended solids; chlorine disinfection; fluoridation; clearwell storage; and high service pumping. The reaction tank effluent is routed to 12 filters. Sodium hypochlorite is added before filtration to recharge the manganese greensand for manganese oxidation and removal. Oxidized iron and other particles are also removed in the filters. The filter backwash process uses water provided by two dedicated backwash pumps, along with air scour, to clean the filter media. Filtered water is routed to two ground storage clearwells (0.5-million-gallon (MG) and 3.0 MG capacity) prior to finished water pumping (See figure 3 for existing structures). The NWRWTP currently is designed to produce 10.5 MGD of finished water.

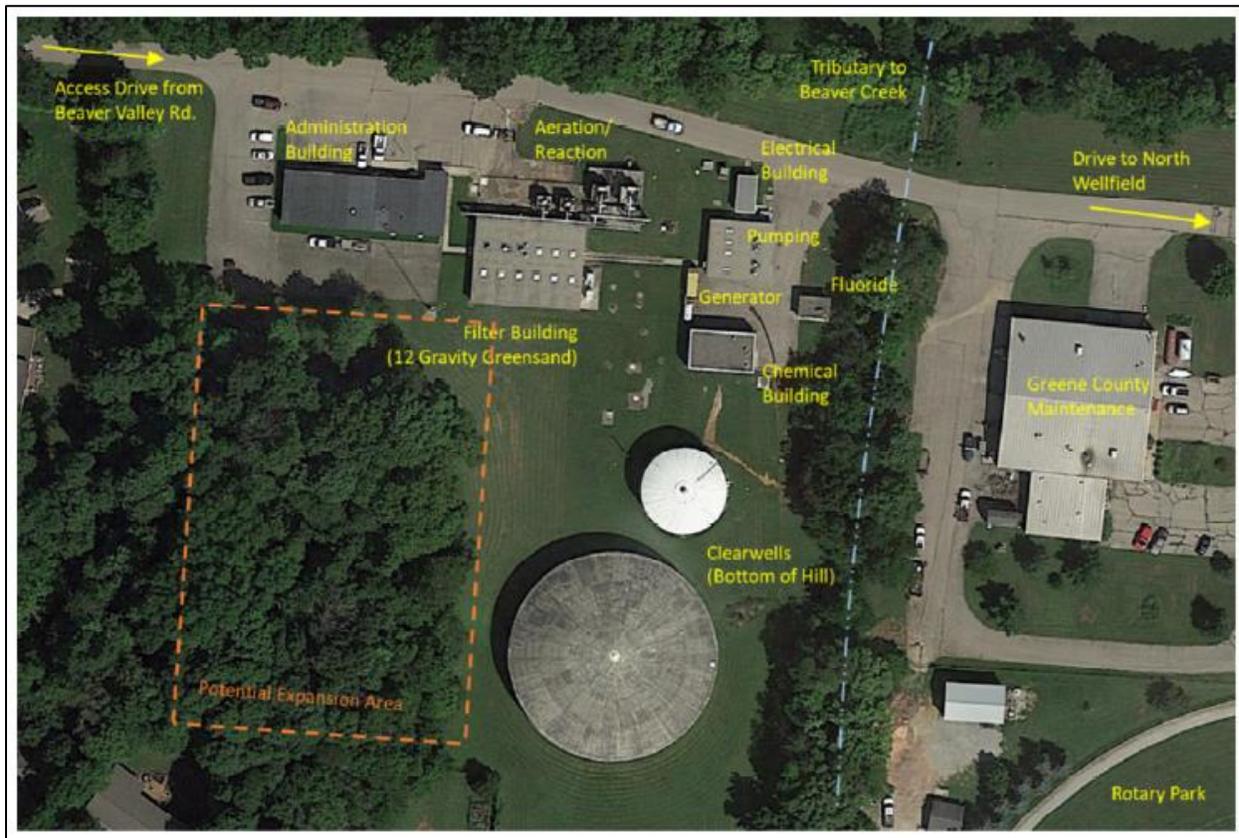


Figure 3. Map of existing NWRWTP facilities

Further possible water treatment processes include softening and removal of perfluorinated compounds (PFAS and PFOA). Greene County does not soften water at the treatment plant currently, and softening is performed at home by most residents. The county is interested in providing centralized softening, which would be more cost effective for water customers. There is no indication of PFAS and PFOA contamination in Greene County wells, but it is closely monitored due to nearby contamination in Wright Patterson Air Force Base wells.

Population and Flow Projections

Greene County performed a regional water master plan and hydraulic model to assess water supply, treatment, and distribution improvements necessary to meet projected water demands through

2040. The population of Greene County has an estimated 167,995 people as of 2018, up 0.5% from the 2010 census. In addition to general increases in population, this master plan considered the potential for increases in demand (up to 2% per year) from the addition of new service areas that may be supplied by the NRWTP in the future, and proposed development around the airport and Cyo service areas. The 20-year projected demands are anticipated to reach 8.56 MGD under average demands and 15.42 MGD under maximum demands conditions. The three combined regions of the system have an average daily water demand of 4.62 MGD, currently serving 17,000 customers.

Alternatives

Alternatives evaluated for water supply and softening options were based on hydrogeological feasibility, financial feasibility, and finished water results.

The two water supply alternatives evaluated were increasing raw water supply through well field improvements and purchasing water. A previous water study in 2008 determined that the projected raw water demand of 19 MGD could be achieved with the existing wells, plus PW-13, PW-14, and a new planned well field. Other well field improvement alternatives were developing wells that draw water from the upper level of the aquifer or supplying water from the Southwest Regional Well Field. Previous studies also evaluated the potential for servicing the North High Service area with water from Dayton or the South High Service Area with water from Montgomery County. Though both options were feasible, but it was determined that purchasing water would have a greater impact on water rates relative to developing additional groundwater within the Northwest Regional Water System.

With low-pressure reverse osmosis (LPRO) membrane softening, additional raw water is needed to account for the lost water from the membrane concentrate stream. A total of 14.1 MGD raw water will be needed to produce 12 MGD of finished water.

Lime softening, membrane softening ion exchange, and pellet softening technologies were evaluated to produce softened water, with lime softening and membrane softening selected as the preferred options to further evaluate. Lime and membrane softening are commonly practiced at other water utilities in southwest Ohio. Ion exchange was not further evaluated because it is not effective enough to achieve the water softening and target pH. Pellet softening was not further evaluated because the resin used for ion reaction requires regeneration, resulting in a waste stream. The high total dissolved solid (TDS) levels generated in this waste would significantly increase overall TDS in the water treatment and disposal process.

Membrane softening as either nanofiltration (NF) or low-pressure reverse osmosis (LPRO) is capable of removing the ions that contribute to water hardness, including calcium, magnesium, iron, and manganese. NF membranes are “looser” and allow some portion of the hardness to pass through, while LPRO membranes are “tighter” and reject nearly all hardness.

Membrane filter concentrate will be disposed to surface water through a new National Pollutant Discharge Elimination System (NPDES) permit, either directly to a stream or blended with wastewater treatment plant effluent.

Cost	Lime Softening	Membrane Softening
Capital Cost Estimate	\$33,500,000	\$43,000,000
Annual Operating Cost Estimate (not including labor)	\$2,231,000	\$586,600
20-Year Present Worth	\$87,800,000	\$57,300,000

Figure 4. Table comparing costs of lime softening and membrane softening

Selected Alternative

Based on a combination of performance and cost, Greene County selected LPRO membrane filtration as the preferred method of softening its water supply. Despite the higher initial capital costs for membrane softening, the lower annual operating costs yield a lower 20-year present worth cost, and membrane softening would yield a lower overall cost than lime softening after approximately six years (see Figure 4). With the planned installations of new wells, raw water supply is available for near-term demands to expand NRWTP to 12 MGD approved capacity. However, additional groundwater capacity must be augmented to meet future approved capacity needs.

Addition of membrane softening would occur after the current aeration/reaction process. Removing iron, manganese, and arsenic in the aeration/reaction process will protect the membranes from potential fouling and help Greene County to meet arsenic limits. New filters will be necessary to expand the plant capacity from the current 10.5 MGD to 12 MGD, and additional filters will be needed to further expand the capacity from 12 MGD to 16 MGD. Since residual chlorine from the aeration/reaction system can damage the membranes, a new sodium bisulfite system will be required to neutralize chlorine upstream of the membranes.

A new process building will be built south of the existing garage and administration building that will house pre-membrane cartridge filters, which are required to protect the membranes from physical damage, high pressure membrane feed pumps, RO arrays, and ancillary systems including chemical feed and membrane cleaning equipment and tankage. Like the lime softening option, the existing administration and garage space will be demolished. New administration and garage facilities will be included in the new membrane process building (See Figure 5 for site drawing).

A new stormwater basin will be constructed south of the existing clarifiers, with piping carrying collected stormwater from the north and west areas of the site expansion, where impervious surface area will be increased. The stormwater basin will include an outfall constructed that discharges stormwater to a tributary of Beaver Creek adjacent to NRWTP. The outfall will be constructed on the bank of the stream and will not involve in-water work.

A discharge concentrate wastewater pipe will be constructed, to carry reject wastewater generated from the filtration process. The piping will transport concentrate wastewater from the filter building to the Greene County wastewater treatment plant to the south of NRWTP (See Fig 6 for alignment). A small portion of the wastewater pipe is included as part of this project, and the remainder of the piping will be financed as a separate loan project.



Figure 5. Drawing of existing NWRWTP showing new building additions to accomplish membrane filtration

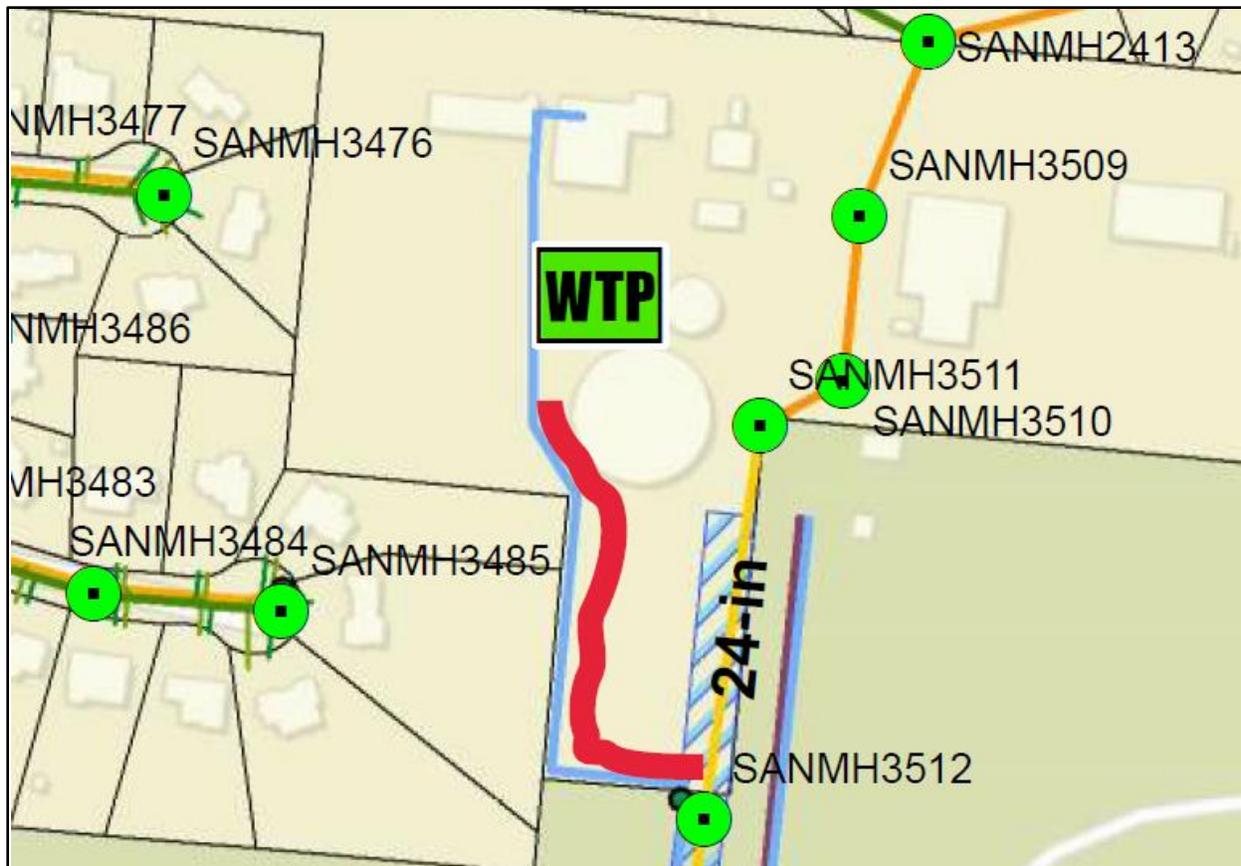


Figure 6. Portion of the membrane concentrate wastewater piping included with the NWRWTP project improvements, marked in red.

Implementation

Greene County will borrow \$45,062,695 from the WSRLA at the standard interest rate, currently at 1.66%. During the 30-year loan period, Greene County will save approximately \$10 million by using WSRLA dollars at this rate, compared to the market rate of 2.96%. The fixed interest rate is adjusted monthly to reflect changing market conditions.

A typical residential water customer in Greene County pays \$31.85 per month for water. The last water rate increase was in 2015, and rates will not need to be raised to repay the debt for this project. According to the 2014-2018 American Community Survey, the estimated median household income (MHI) for a resident of Greene County is \$65,032. The average yearly water utility bill costs \$382, which is 0.59% of the MHI and compares favorably to the Ohio average bill, \$639.

Anticipating loan award in June 2022, construction will be complete by the end of 2024.

Public Participation

Greene County made thorough efforts to educate the public about water system improvements and provide an annual consumer confidence report for each water district in Greene County on their website. Several news articles have been published in the Beavercreek and Dayton area news about the planned improvements to the Northwest Regional WTP and the addition of a new well field site

to secure the county's future raw water supply. The county also plans to hold public meetings to present information on the planned WTP expansion project and addition of reverse osmosis membrane water treatment.

Multiple public meetings have been held by Greene County to present the project to residents, and answer questions with the most recent public meeting held in April 2022. Green County continues to work with local residents to address their concerns about construction safety, noise, aesthetics, and schedule as the construction initiation date approaches.

Ohio EPA is unaware of opposition to or controversy about the project. Ohio EPA will make a copy of this document available to the public on its web page, available for comment for 30 days, and will provide it on request to interested parties.

The following agencies and authorities reviewed this project's planning information:

Ohio Environmental Protection Agency
State Historic Preservation Office
Ohio Department of Natural Resources
U.S. Fish and Wildlife Service
U.S. EPA Region 5, Sole Source Aquifer Coordinator
Local Floodplain Coordinator

These review agencies have provided comments, and none oppose the project.

Environmental Impacts

The project has the potential to affect the following features, but the effects will be reduced or mitigated to acceptable levels. Several agencies have reviewed this project and provided input and recommendations for best practices that minimize negative impacts to environmental features, as explained below.

Air Quality: Greene County meets standards for the six regulated air pollutants (carbon monoxide, sulfur dioxide, nitrogen oxide, lead, particulate matter, and ozone). During construction, dust and vehicle exhaust will be insignificant sources of local air pollution. Dust due to excavation in dry weather will be controlled by good housekeeping measures (minimizing the area of disturbed soil, road sweeping, dust suppression with water or other benign dust suppressant). Because of its temporary nature and the use of emissions controls on motorized equipment, construction vehicle exhaust will be an insignificant pollution source compared to background sources of motorized vehicle exhaust in the greater project area. Based on this information, the project should have no significant adverse short-term or long-term impacts on local air quality.

Archaeological and Historical Resources: A Phase 1 Archaeological survey was conducted for the Greene County WTP project area of 10.55 acres, where the land was visually inspected and shovel pit excavations were used to identify any cultural resources that may be present. None were found in the proposed project area. The State Historic Preservation Office (SHPO) concurs with Ohio EPA's finding of no effect because no archaeological or cultural resources were found during the survey.

In the event of archaeological finds during construction, Ohio Revised Code Section 149.53 requires contractors and subcontractors to notify SHPO of any archaeological discoveries in the project area, and to cooperate with the Office in archaeological and historic surveys and salvage efforts when

appropriate. Work will not resume until a survey of the find and a determination of its value and effect has been made, and Ohio EPA authorizes work to continue.

Aquatic Habitat, Endangered Species, Fish and Wildlife: The entire state of Ohio is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species, the northern long-eared bat (*Myotis septentrionalis*), a state endangered and federally threatened species, the little brown bat (*Myotis lucifugus*), a state endangered species, and the tricolored bat (*Perimyotis subflavus*), a state endangered species. During the spring and summer, these species of bats predominately roost in trees behind loose, exfoliating bark, in crevices and cavities, or in the leaves. However, these species are also dependent on the forest structure surrounding roost trees. Trees suitable for summer bat roosting and foraging were cut for this project, and to minimize impact to bats, trees were cut seasonally when bats are hibernating. Because the WTP expansion will occur within existing WTP facility and lawn, and any tree cutting occurred when bats were inactive and less likely to be using this habitat, the project is unlikely to impact these species.

The project is within range of the following mussel and fish species: federally endangered clubshell (*Pleurobema clava*), rayed bean (*Villosa fabalis*), and snuffbox (*Epioblasma triquetra*), and state threatened black sandshell (*Ligumia recta*), fawnsfoot (*Truncilla donaciformis*), and tongue-tied minnow (*Exoglossum laurae*). A wetland delineation survey was performed on the site, and a stream was identified as possible habitat along the east border of the site. Silt fencing will prevent sediment runoff into the stream, and because there will be no in-water work where the stormwater outfall will be installed, the project will not impact these species.

The project is within the range of the eastern massasauga (*Sistrurus catenatus*), a state endangered and a federally threatened snake species, the Kirtland's snake (*Clonophis kirtlandii*), a state threatened species, and the spotted turtle (*Clemmys guttata*), a state threatened species. These species use a range of wetland, wet prairie, fen, marshes, bogs, ponds, and stream habitats as well as adjacent upland habitat. Due to the urban location and lack of wetland habitat in the project area, this project is not likely to impact these species.

The project is within the range of the lark sparrow (*Chondestes grammacus*), a state endangered bird, the least bittern (*Ixobrychus exilis*), a state threatened bird, the northern harrier (*Circus hudsonis*), a state endangered bird, and the upland sandpiper (*Bartramia longicauda*), a state endangered bird. The lark sparrow nests in grassland habitats with scattered shrub layers, disturbed open areas, as well as patches of bare soil. The secretive least bittern prefers dense emergent wetlands with thick stands of cattails, sedges, sawgrass or other semiaquatic vegetation interspersed with woody vegetation and open water. The northern harrier is a common migrant and winter species, who breeds in large marshes and grasslands. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). Because these kinds of habitat will not be impacted, this project is not likely to impact these species.

Energy: This project will require an increase in energy consumption. Greene County is changing water treatment process to incorporate membrane filtration for softening and will be increasing the amount of water treated. It is necessary to increase the amount of water treated to ensure enough supply for projected regular growth of Greene County and the public, and to provide enough local water to stop purchasing water outside Greene County.

Land use: Some land use changes will occur. Where the water treatment improvements will expand the WTP grounds, one acre of wood lot was cleared to accommodate the new buildings and driveway.

Seasonal tree clearing restrictions were followed to avoid impacting wildlife, and erosion control measures will be in place on bare soil while construction has yet to begin.

Floodplains: The proposed stormwater basin and portion of membrane concentrate discharge piping are within the 100-year floodplain, and coordination with the local floodplain coordinator is required. Because the stormwater detention basin does not construct a raised structure, it will not negatively impact floodplains. The concentrate discharge piping will be buried when complete and will not interfere with the floodplain.

Ground Water Resources: Much of Green County lies within the Miami Buried Valley Aquifer, a Sole Source Aquifer. The project was reviewed by the U.S.EPA Region 5 Sole Source Aquifer coordinator who provided comments for best management practices for storm water and runoff control, dewatering settling and filtration, fuel and chemical spill containment and storage practices, and appropriate disposal of demolished materials and soil that will be implemented to ensure construction actions will not contaminate the aquifer.

Local Economy: By using low-interest financing, Greene County has minimized the project cost and the economic impact on customers. Greene County will not need to increase water bills to repay this project loan.

Safety, Traffic, Noise, and Aesthetics: This project will occur on existing WTP land, adjacent to residential property. Aesthetics may be altered for a few residential houses adjacent to the NWRWTP where a wood lot was cleared for the expansion. The project will include improvements and changes at the existing water treatment plant property and will not change aesthetics outside WTP property. Construction best-practice and safety standards will be followed by the contractors for this project as outlined in detail plan notes. A secure fence has been installed between residential housing and WTP expansion area with a cloth screen for safety and aesthetics. Local traffic will not be affected because the WTP access road is a private driveway. Construction will occur during the week during daylight hours from 7:00 am to 3:30 pm.

Surface Water Resources: A stormwater pollution prevention and protection plan will be in place during construction, with silt fencing installed around excavations. Soil will be disposed of in an appropriate offsite location. Stormwater flow from the cut and filled expansion and increased impermeable surfaces of the new filter building and driveway will be directed across the site and piped to a new stormwater basin on the south end of the WTP property. Green County will obtain the required permitting for the increased impermeable surfaces. The stormwater basin outfall will discharge to an adjacent tributary of Beaver Creek, and does not require a NPDES permit for this kind of stormwater discharge.

Terrestrial and Aquatic Habitat – A wetland delineation survey was performed in December 2021 by AECOM to identify possible wetlands on the WTP site based on vegetation, hydrology, and soil characteristics. No wetlands were identified in the one acre of woodlot cut for the expansion, and a stream was identified on the right border of the property. A stormwater basin outfall will be installed on the edge of the Beaver Creek tributary stream, but no in-water work will occur.

Unaffected Environmental Features: No Safe Drinking Water (private drinking water wells), State or Federal Wild or Scenic Rivers, Prime Farmland, or Coastal Zones are present in or near the work sites, and therefore will not be affected.

Conclusion

Based upon Ohio EPA's review of the planning information and the materials presented in this Environmental Assessment, we have concluded that there will be no significant adverse impacts from the proposed projects as they relate to the environmental features discussed previously. This is because these features do not exist in the project areas, the features exist but will not be adversely affected, or the impacts will be temporary and mitigated.

For these reasons, these projects are not expected to result in any significant indirect or cumulative short-term or long-term adverse environmental impacts.

Ohio EPA expects the economic impact of the project on the average user to be insignificant because anticipated project debt requires no rate increase.

This project will result in an upgrade to the total treated water produced from NRRWTP, increasing from 10.5 MGD to 12 MGD. The water treatment will be upgraded to provide softened water by means of membrane filtration, resulting in local public health and water quality benefits. The project will help ensure continued distribution of water meeting Safe Drinking Water Act requirements.

Contact information

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